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CONTENTS

SATISFACTION OF FUTURE ENGINEERING TEACHERS WITH THE USE OF THE ELECTRONIC PORTFOLIO IN THE PEDAGOGICAL DISCIPLINES

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Abstract: *The use of an e-portfolio as an assessment modality in e-distance learning is a response to recent developments in higher education where assessment is an integral part of teaching and learning. The present study aims to determine the level of student satisfaction with the use of the e-portfolio in the study of pedagogical disciplines and to reveal changes according to the identified variables. As a sample of this study, 123 students from UTCN enrolled in the psycho-pedagogical module in the initial teacher training were selected. From the closed items, it was confirmed that the students' satisfaction in using the e-portfolio was at a high level, that a complex portfolio is a relevant method for evaluating students' knowledge and skills, it promotes active and collaborative learning, the platform offers sufficient resources, and it is easy to use for carrying out the activities. There were no significant differences regarding gender, faculty profile, year of study and previous experience of students in using the e-portfolio. Various suggestions were made for future studies to create more effective online and hybrid learning environments in the training of future engineering teachers.*

Keywords: *e-portfolio; satisfaction; alternative/ complementary assessment methods; new technologies; future engineering teachers.*

1. Introduction

The COVID-19 pandemic has had a particularly strong impact on education, especially in methodological strategies and their practical implications for university activities. The transition from face-to-face teaching to online teaching environments in a very short time was a challenge for teachers, who had to find new teaching methodologies to make the teaching-learning-evaluation processes more flexible. Information and communication technologies represent a key element

in facing this challenge of building environments that facilitate communication and exchange of learning experiences between teachers and students. In this sense, Van Wyk (2017) states that teachers have become more exposed to technologies that influence the classroom environment, teaching strategies, methods, and techniques, and that this technological change requires teachers to have a deep understanding of digital pedagogy or Technological Pedagogical Content Knowledge – TPACK (Mishra & Koehler, 2006). The use of an e-portfolio as an assessment modality in e-distance learning is a response to recent developments in higher education where assessment is an integral part of teaching and learning. This suggests that the need to integrate technology into teaching and learning has driven the need to integrate technology into assessment as well. Since the purpose of this study is to identify the level of student satisfaction with the use of the e-portfolio from the perspective of the assessed students, now is a good time for the faculties to start the process of reflection on the methodological change involved in the development of university teaching, learning and assessment that encourages the use of virtual environments in combination with face-to-face activities to maximize the benefits of both, in other words the use of blended learning.

1.1. What is e-portfolio?

An e-portfolio "is essentially an electronic version of a paper-based portfolio, created in a computer environment" (Butler, 2006, p. 10), a so-called "digital container" (Benson, 2009, p. 12) that stores multimedia effects such as video and audio content and some social programs such as blogs, social networks, which allow online users unprecedented interconnection and interactivity for pedagogical and evaluation purposes. The e-portfolio has been introduced as an alternative or complementary way of assessment as higher education transforms from a paper-based teaching and learning approach to an e-learning approach. This change requires a rethinking of pedagogical training of teachers from the very beginning of their training, from traditional to digital. According to Boulton (2014), an e-portfolio is an evidence-based multimodal assessment strategy that is currently included in most university teacher education programs both locally and globally. Van Wyk (2017) names the e-portfolio as an alternative assessment strategy for empowering students' self-directed learning as future teachers, which provided them with the opportunity to use different types of information technology tools such as podcasts, blogs, PowerPoint presentations, electronic discussion forums etc.

In Barrett's (2011) conception, the main purpose of the e-portfolio can refer to learning/reflection and presentation/responsibility, the first

being directed to an internal audience, and the second to an external audience. However, in higher education there can be an interaction between these two poles, and the e-portfolio can contain aspects which aim to achieve both goals. According to the Romanian pedagogy, the e-portfolio is presented as an alternative/complementary assessment method which, through its informative and formative value, helps in the correct and appropriate assessment of students. Usually, the focus is on the components of the portfolio, as well as the advantages and disadvantages of its use both for the evaluated students and for their evaluators (Cucoș, 2014; Bocoș & Jucan, 2017; Frunză, Enache, & Oprea, 2008). However, it is worth noting that the purpose of the assessment, the type of study discipline, the objectives of the discipline, the knowledge level of students and the duration of the portfolio preparation determine the selection of elements that will be included in an e-portfolio.

According to Abrami and Barrett (2005), three types of portfolios can be identified: the portfolio as a tool for storing information to be used in the learning process, the portfolio of learning products (containing the learning outcomes) and the portfolio as a process and workspace (containing artifacts of the learning process that highlight the achievements and difficulties encountered). In fact, Cooper and Love (2007) described two types of portfolios: the formative portfolio (focused on the learning process for each student, on continuity and progress) and the summative portfolio (focused on the organization and learning outcomes). It is worth emphasizing the contribution of Frunză et al. (2008), which highlights two main aspects of this method: 1) the portfolio as a means of learning, which identifies aspects of student performance in learning such as: cognitive endurance - determined by a series of tasks developed by the student; metacognitive endurance – enhanced by considerations of work tasks, procedures and techniques; affective endurance – encouraged by personal contributions, the student's original achievements; conative endurance – stimulated by indications relating to the elimination or reduction of certain deficiencies or shortcomings; 2) the portfolio as a tool used to validate the results, mainly those acquired by the students.

In the academic environment, e-portfolios are usually classified as: the learning portfolio, the presentation portfolio, and the assessment portfolio (Cucoș, 2014). Currently, most e-portfolios are hybrid types that include features of developmental, assessment, and presentation portfolios.

According to Barberá et al. (2006), the digital portfolio has three phases: the presentation of students' academic preparation; collection,

selection, and publication of works; and the overall assessment of the digital portfolio according to specific criteria.

1.2. Satisfaction of future teachers regarding the use of the e-portfolio

E-portfolios are gaining ground in educational settings, especially in teacher education (Totter & Wyss, 2019). In this context, the portfolio goes a step further and is more than a collection of artefacts, as it encourages critical reflection, facilitates both formative and summative assessment and contributes to the formation and development of future teachers' competencies. (Mohammed et al., 2015).

The future teachers, having the benchmarks of the competence to qualitatively build the portfolio of their own pedagogical training, will be able to support the students in using this formative tool. As Van Wyk (2017) states, e-portfolios should not be seen as a "'nice-to-have' idea but be used as an integrated technology and pedagogy approach as vital components for the successful implementation of the e-ePortfolio as an alternative assessment strategy in student teacher empowerment" (pg. 288). The e-portfolio should provide future teachers with pedagogical and technological skills that enable them to cope with the current demands of teaching and learning in the digital classroom.

Deneen, Brown, and Carless (2018) found that a positive attitude toward the e-portfolio contributes to better assessment for learning. Wang and Jeffrey (2017) indicated that most learners preferred e-portfolio-based formative assessment over paper-based exams because formative assessment helped them sustain their motivation. Similarly, Jackson (2017) concludes that the e-portfolio has good utility as a tool for collaboration and communication between teaching staff and students and between students themselves. According to Kabilan and Khan's (2012) study, future teachers not only formed positive attitudes toward e-portfolios, but also developed a deeper understanding of the teacher's role, teaching skills, and activities.

The transformation in higher education in terms of the use of technologies in teaching and learning, as well as in assessment, is a global trend, which means that there should be a rethinking of the initial pedagogical training of teachers. This is the reason to explore how the use of an e-portfolio as an alternative/ complementary assessment method improves the pedagogical training of future engineering teachers in a psycho-pedagogical module.

2. Research design

2.1. Objective

The study examines the satisfaction level of using the e-portfolio, the formative potential of this alternative/ complementary assessment method, in the process of (self) assessment of the competences of future teachers. In the empirical research carried out, the questionnaire-based method and activity analysis (portfolios prepared by students) were used. Therefore, the research problem was formulated in the following main questions:

Question 1: What is the level of student satisfaction with using the e-portfolio?

Question 2: Is there a significant mean difference between students' satisfaction with the use of e-portfolio and gender, faculty profile, year of study and previous experience in using this tool?

With the various e-portfolio tools available in many universities around the world such as Mahara, Pebble, WordPress, Pathbrite, etc., the study helped highlight the use of university resources, the current Microsoft licenses available and the use of MS OneNote as a tool for e-portfolio. The digital portfolio was created using the Microsoft 365 platform, which consists of a set of communication and collaboration tools available in the Cloud and which integrate Microsoft Office applications. Through these tools, students were able to interact and receive feedback from their peers and the teacher. The content of the portfolio consisted of individual, or group tasks carried out by students in the disciplines Pedagogy I, Pedagogy II and Classroom Management, such as: critical and argumentative analyses, concept maps, questionnaires, case studies, comparative analyses, lesson projects, assessment tests, posters, etc. All students enrolled in the psycho-pedagogical module have an account for access to the Microsoft 365 platform. With this account, students have MS Office online, collaboration tools, online storage, many other communication applications and a free download on their computers and laptops. The availability of texts, images and uploaded files are the main elements needed to create a creative e-portfolio. E-portfolio sharing is also an important element that is available with MS OneNote. The transition to different teaching assessments was not difficult with the current availability of MS OneNote and the availability of video tutorials in access learning resources in the university.

2.2. Participants

The participation in this study consisted of 123 students in different undergraduate programs in UTCN enrolled in the psycho-pedagogical module. The sample of students is distributed as follows: 40.7% are from the construction profile, 59.3% students from the electrical

profile; 51.2% women, 48.8% men; 23.6% students are from the first year, 36.6% students in the second year and 39.8% students in the third year; 51.2% of the total number of students had previous experiences in using the e-portfolio, and 48.8% of the students did not have such previous experiences. The researcher informed the students about the objectives of the study and assured them that their participation would be voluntary and anonymous.

2.3. Instruments

The questionnaire used in the research was taken and adapted from the Questionnaire on the E-Portfolio in Higher Education (QEPHE) by Hinojosa-Pareja et al. (2020) to assess student satisfaction with the use of e- the proposed portfolio. The questionnaire is constructed on a 5-point Likert scale, on which participants rated each item from "Strongly Disagree" to "Strongly Agree". The questionnaire consists of 3 dimensions (Pedagogical issues – 14 items, Professor's work – 9 items, Usability – 9 items), and Cronbach's alpha value for the entire questionnaire was calculated at 0.92.

3. Results

To investigate the level of satisfaction of prospective teachers regarding the use of e-portfolio, means were calculated for each dimension of the QEPHE questionnaire. The analysis based on the observed scores on each dimension showed a positive level of satisfaction with the use of the e-portfolio (Table 1) (M = 4.15, SD = 0.408). The highest mean was found in the Usability dimension (M = 4.40, SD = 0.463) and the lowest mean was found in the Pedagogical Issues dimension (M = 3.89, SD = 0.741). According to the results presented in Table 1, student satisfaction was generally positive, implying that the e-portfolio is rated satisfactorily by students.

Dimensions	Mean	SD
Pedagogical Issues	3.89	0.741
Professor’s work	4.15	0.525
Usability	4.40	0.463
TOTAL	**4.15**	**0.408**

Table 1. Level of satisfaction with the use of e-portfolio

The second research question was whether there is a significant average difference between students' satisfaction with the use of e-portfolio and gender, faculty profile, year of study and previous experience in using this tool. The Mann-Whitney U test was used to

examine the level of student satisfaction according to gender, faculty profile and their previous experience in using the e-portfolio (Table 2).

Var.	Cases	N	Mean Rank	Sum Rank	U	Z	p	Effect Size
				Gender				
Satisf.	Female	63	60.83	3832.5	1816.5	-.372	.710	0.06
	Male	60	63.23	3793.5				
				Faculty profile				
Satisf.	Building	50	64.27	3213.5	1711.5	-.584	.559	0.10
	Electric	73	60.45	4412.5				
				Previous experience				
Satisf.	Yes	63	62.36	3928.5	1867.5	-.114	.909	0.02
	No	60	61.63	3697.5				
$p < .05$								

Table 2. Results of the Mann-Whitney U test of satisfaction scores towards the use of e-portfolio, according to gender, faculty profile and previous experience of the students

It can be seen from Table 2 that there was no statistically significant difference in students' satisfaction with the use of e-portfolio based on their gender ($U = 1816.5$, $p = .710$). Also, data analysis indicates that there was no statistically significant difference regarding faculty profile ($p = .559$, $r = 0.10$) and previous experience related to student satisfaction in using the e-portfolio ($p = .909$, $r = 0.02$).

Also, student satisfaction scores in the use of e-portfolio use were analysed by year of study in which the students are enrolled. The Kruskal Wallis H test was used to analyse satisfaction scores. The results are presented in Table 3:

Variable	Cases	N	Mean Rank	df	*X2*	p	Effect Size
			Year of study				
Satisfaction	1st year	29	73.43	2	3.947	.139	0.25
	2nd year	45	59.29				
	3rd year	49	57.72				
$p < .05$							

Table 3. Results of the Kruskal Wallis H test of satisfaction scores with the use of e-portfolio, according to the year of study

When Table 3 is examined, it is found that the satisfaction scores of students in the use of e-portfolio do not differ significantly by year of study ($X2 = 3.947$; $p > 0.05$, $r = 0.25$). However, given the mean ranking, it is understood that first-year students have a higher satisfaction with the use of e-portfolio compared to second- and third-year students.

4. Discussion

The present research is based on a quantitative analysis of the level of satisfaction of using the e-portfolio as an alternative/ complementary assessment method. According to the feedback received from the students included in our research sample, the e-portfolio is an effective assessment tool that provides increased satisfaction in the initial professionalization of future teachers. The results from this study are in line with those obtained from Alwraikat's (2012) study which indicated that students expressed positive attitudes towards the use of e-portfolio. The e-portfolio can indicate not only a student's academic level, but also their skills and aspirations, if the teacher is flexible and encourages creativity and diversity.

The usefulness of the e-portfolio in assessment, the methods used to stimulate active and interactive learning, as well as the tracking of learning progress seem to be essential for student satisfaction. In the same vein, Costley and Lange (2016), found that a lower level of teacher control over the learning process in facilitating participation and greater flexibility increased student satisfaction. However, the students in our study expressed uncertainty about both the teacher's concern for student learning and increasing their motivation in the course. The results support the findings of Bolliger and Martindale's study (2004) which indicated that teachers in digital environments should not only facilitate learning, but also motivate students.

Regarding the Professor's Work dimension, the items that the students evaluated the best were the creation of a favourable climate for learning and the explanation of the evaluation procedure that will be used with the e-portfolio, the students being generally satisfied with the teacher's actions. In the same line are the findings from the study by Gamiz-Sanchez et al. (2019) which shows that the highest rated items were those related to learning climate created, communication among students and the promotion of the free expression of ideas or concerns.

From the students' perspective, the strongest satisfaction factor was using the communication or interaction tools provided by the platform. Students appreciated with high scores that their own technological knowledge was sufficient to carry out the assigned activities and the ease of use of the platform, which provides the right tools for

interaction and communication with peers and the teacher. On the one hand, the teacher encouraged the use of platform tools to promote communication, using the most appropriate ones in each case. On the other hand, the support provided by the teacher was fundamental for the students' perception of the ease of use of e-portfolio, its usefulness, in solving questions and problems related to the platform (Arteaga-Sánchez & Duarte-Hueros, 2010).

In this study, the variables of gender, faculty profile, previous experience and year of study did not produce significant differences in student satisfaction. Our study shows, however, that not only the usefulness of the platform increases student satisfaction, but also how the teacher designs, implements and evaluates the e-portfolio. These findings are in line with Karami et al. (2019), who showed that an e-portfolio helps students develop their writing performance, improves the testing process, supports learning, encourages student participation, improves student autonomous learning, develops teachers' roles, and supports lifelong learning.

The university should implement a support program for students who experience access to and use of new technologies and address the issue of connectivity for students who experience such issues. The findings of Klampfer and Köhler's study (2015) show that a positive attitude of students towards the e-portfolio is associated with ease of use and reliability of the infrastructure. E-portfolio implementation requires a lot of resources in addition to an efficient platform. Moreover, it can be recommended that minimum digital skills be developed before using e-portfolios.

Despite the benefits of the e-portfolio, the performance of the activities has led students to resort to plagiarism, cheating or copyright infringement when sharing ideas. One way to combat this was to provide precise guidance on the norms of academic ethics and integrity, but also to include reflection activities on what happened during the process of creating the e-portfolio. We also specify that students need the support of teaching staff in planning and organizing documents, selecting the most relevant or representative materials, as well as counselling in motivation (general and personal), self-evaluation and the use of new technologies. When students do not have sufficient knowledge to compile a portfolio, it may be incomplete or inconsistent. The key point is to establish standards, clear, well-defined, and established evaluation criteria from the beginning, so if there are no standards for the artifacts in the portfolio, inconsistencies and gaps appear. Also, special attention should be paid to the time frame. Thus, the earlier students start creating a portfolio, the more complete it will be.

In the stage of initial training in higher education as future teachers, the portfolio can be an excellent addition to the professional and academic development of students, both from a methodological perspective and from an evaluative point of view, in the didactic strategy of different disciplines, allowing them to show what they learn, reflect on the learning process, engage students, and establish innovative alternatives based on their professional development. The use of alternative/ complementary assessment methods encourages students to focus on real and authentic tasks that relate to themselves and their daily activities. We also believe that students can monitor and control their learning activity through the e-portfolio, thereby contributing to their learning. The e-portfolio stimulated the cognitive and metacognitive development of the students and led them to be more responsible. They managed to enrich the content of the portfolio with many new and representative ideas for each topic with their own solutions. At the same time, constant cooperation with each other was encouraged. The students found the e-portfolio an interesting experience, they had an active role that made them more aware of their studying and learning possibilities.

The findings revealed that the e-portfolio gave students the opportunity to collaborate while using it, mainly on how individual assignments should be written and how group activities should be done. In this study, students collaborated by sharing ideas and learning experiences about traditional and modern teaching practices or classroom management principles implemented in pre-university education. These were some of the topics of group activities within the e-portfolio, namely, to form a community of practice in their endeavours as they connect and interact with each other to share information. By using an e-portfolio as an assessment method, students were given the opportunity to collaborate. The idea is supported by McCormick (2004), who states that the use of digital technologies provides opportunities both to "collaborate to learn" and to "learn to collaborate" (p. 159), in this case, learning about possibilities of management of the problems facing high school classes and learning to work with each other to formulate solutions in identifying and analysing strengths, weaknesses and preventing/overcoming the latter in student class management.

It is recommended that students' opinions about e-portfolio should be considered by decision-makers, teachers, researchers in higher education to review the current policy in universities to improve student satisfaction with instructional-educational activities. Given the contemporary paradigms of teaching and learning activities, e-portfolio assessments will produce more effective and beneficial outcomes for

learners. The researchers state that teachers need to inform students that e-portfolios focus on both processes and products as outcomes of their activities. Traditional product-only assessment should be replaced by more up-to-date assessment approaches that value not only the products, but also how learners spend their time learning.

5. Conclusion

The training of future teachers must be done in accordance with current education models and educational paradigms, as they are, in turn, able to train others. To traditional assessment methods that should not be eliminated, alternative/ complementary methods are gaining ground. Of these methods, the portfolio is the most widely used at all levels of schooling. In this study, we have shown the effectiveness of this digital tool in assessing and forming the competence profile of future teachers, with students having a high level of satisfaction in using the e-portfolio. The variables of gender, faculty profile, previous experiences and year of study did not produce significant differences in student satisfaction. Our study shows, however, that not only the usefulness of the platform increases student satisfaction, but also how the teacher designs, implements and evaluates the e-portfolio. However, the findings of this investigation cannot be generalized because only a small sample was used in a few initial teacher training courses.

It can therefore be concluded that the integration of the e-portfolio at the university level would increase the level of students' satisfaction with the use of this method in learning pedagogical subjects and would release their potentialities in relation to the learning process.

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CREATIVE INTELLIGENCE AND CREATIVE WRITING

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Abstract: *Creative intelligence is the ability to find solutions to small or large problems and requires a kind of abstract thinking in unusual ways at an individual or group level. Through it, the individual acquires new skills and knowledge, devises solutions to problems and increases his or her imagination. Creative intelligence can be expressed and enhanced through creative writing, i.e. through writing novels, short stories, poems and other textual genres. Writers, using language, seek the most appropriate words to express their thoughts and describe all the images in their mind, while experimenting with forms and structures in order to find innovative ways to reach their readers.*

Keywords: *intelligence; writing; creative.*

Introduction

The manner in which we understand everything that happens around us, how we adapt to our environment, how we learn, think and cope with difficulties is not the same for all people. This cognitive ability is innate in humans and is called intelligence. Therefore, as the cognitive performance of a person varies in different situations and by different criteria, understanding intelligence as a complex concept is possible through its external manifestations and effects (Fustana, 2007). However, the original notion that it is a vast repository of information has now been replaced by the view that it is a network of interconnectedness and interrelated knowledge structures (Gallagher, 2003).

Until the early 1990s, the majority of studies confirmed the existence of only one form of intelligence, cognitive intelligence, which develops mainly in the first three years of life (Kafetsios, 2003). In fact, according to traditional views, intelligence is a single ability to solve problematic situations and successfully cope with reality, whose level is determined mainly by genetic and much less by environmental factors, while, at the same time, it can be measured by using the classical intelligence tests (I.Q. tests) (Kassotakis, 2022).

In 1983, the American psychologist Gardner presented in his book "Frames of mind" the radical view of multiple intelligences, identifying seven types of intelligence which are autonomous, as they have a separate biological deposit in the brain (Gardner, 1983). According to him, all people have skills and talents, which we call intelligence, and the only thing that differs among them is the degree of each skill and the way in which said skills are combined. The seven types of intelligence described by Gardner are the following: 1) Verbal-linguistic intelligence, which refers to correct word choice, correct textual analysis, memorisation and argumentation. 2) Musical-rhythmic intelligence, which refers to the appreciation of melody, rhythm and the various forms of music. 3) Logical-mathematical intelligence, which is used in arithmetic and mathematical calculations. 4) Visual-spatial intelligence, which is related to orientation and space. 5) Interpersonal intelligence, which is related to understanding and expressing emotions. 6) Intrapersonal intelligence, which refers to the understanding of our strengths and weaknesses and, finally, 7) Kinesthetic intelligence, which includes abilities to coordinate bodily movements in subtly differentiated ways (Kassotakis & Flouris, 2006).

Another theory dealing with human intelligence is the Triarchic theory of intelligence, which is comprised of three subtheories: (a) the constitutive, (b) the experiential, and (c) the contextual. The first subtheory defines the mental processes that underpin behaviour, while the second defines the relationship between behaviour towards a goal and the individual's experience of that goal. The latter hypothesis links intelligence to the external world, determining which behaviors are intelligent and in which context (Sternberg, 1997). The Triarchic Theory of Intelligence is identified with Successful Intelligence which is defined as the ability of an individual to use a set of cognitive abilities in order to succeed in life within the socio-political context in which they live and with the goals they have set. In fact, this success occurs when the individual takes advantage of all his or her abilities and possesses analytical, creative and practical thinking in equal measure (Sternberg, 1998).

Continuing the above about the Triarchic Theory of Intelligence, human intelligence includes three dimensions-abilities that play an important role in the cognitive functioning of the individual and are the following: a) Analytical intelligence which involves the analysis, judgement, comparison and evaluation of the evidence in a situation. b) Practical intelligence which is related to the individual's ability to solve problems and c) Creative intelligence, which is possessed by those individuals who can discover innovative ideas and find original solutions to the problems they face. People with heightened creative

intelligence are distinguished by their imagination and ingenuity (Sternberg, 1999a. Sternberg, 1999b. Sternberg & Grigorenko, 2002).

Relationship between intelligence and creativity

According to Flach (1988), the emergence of creativity is associated with possible stress or potential crisis that the individual may be experiencing. This stress, as it may upset his/her mental equilibrium, leads the individual to an internal conflict. This conflict in turn can lead to a complex reorganization of his personality. In fact, if the person is able to integrate this conflict into a higher level of mental balance, then he or she becomes more adaptive, but also more resilient to stressful situations in the future. Otherwise, the individual develops a dysfunctional mental balance and is less adaptive to future changes. It should be stressed that the role of a supportive environment that is open to communication and new ideas is important in order to promote and develop creative change.

For Haensly and Reynolds (1989), intelligence and creativity can be seen as two intersecting cycles. On the intelligence side, what lies outside the intersection constitutes clear thinking and is correct, but cannot lead to greater possibilities. On the side of creativity, what lies outside the intersection is unusual, diverging into new areas, but cannot be justified. The intersection space of intelligence and creativity includes what is original, correct and justified.

In addition, for Stacey (1996), the intelligence of a creative person is a complex system, consisting of two subsystems: a dominant symbol system and a residual one. Through the first subsystem, the individual strives to improve themselves and critically evaluates the effectiveness of their work, taking into account the demands of the environment. On the other hand, through the second subsystem, the individual enjoys the life of imagination, play and creativity. Through the coexistence of the two subsystems, a safe creative space emerges that leads the individual to innovation.

Piaget (1962), in the context of his theory on cognitive development, sees intelligence as a process of mental balancing, as the individual, and indeed the child, on the one hand adapts the mental schemas according to the demands of the environment and on the other hand assimilates or processes them to satisfy the child's own desires. It should be noted that the child suffers a mental imbalance when the child experiences a cognitive conflict, i.e. a discrepancy between his/her own expectations and the expectations of his/her environment. If this cognitive conflict is neither too great nor too small for the child's developmental capacity, he or she will be able to assimilate and process mental schemas, i.e. create new schemas to resolve each conflict.

For Guastello (1998), creativity is closely related to the problem-solving process in which ideas are generated and combined. These ideas are organized, evaluated and refined until the problem is given a solution. Similarly, Holland (1998) also states that creativity and innovation begin with the identification of a solution to a problem situation. In the process of solving said problem, the individual creates new combinations of the already basic and given elements, so that, eventually, they transform what is abstract and constitutes in essence the problem into something familiar and accessible.

Creative intelligence

To begin with, it is important to clarify the distinction between the concepts of 'creativity' and 'creative intelligence'. Sternberg (2006) states that an individual is creative when through the search for new, and indeed unpopular, ideas he or she is able to create something particularly important or even valuable. According to the aforementioned (2003), creative intelligence refers to the ability to apply innovative mental patterns to a variety of situations. In addition, Kaufman, Cole and Baer (2009) state that creative intelligence can be seen as a component of overall creativity.

For Buzan (2017), creative intelligence is an individual's ability to come up with new ideas and solve problems in original ways, using their imagination and productivity. It includes the following factors: (a) the ability to use both the right hemisphere of the brain (creativity, spatial skills, artistic and musical skills) and the left hemisphere (speaking, comprehension, arithmetic, writing); (b) the ability to capture new ideas on paper in order to process them better; (c) the speed of generating new ideas, (d) the ability to generate different kinds of ideas, using different strategies and from different perspectives; (e) the creation of original, unusual and 'eccentric' ideas; (g) the extension of these ideas; and (h) the association of ideas with other ideas in order to enhance all aspects of creativity.

Furthermore, Rowe (2004) states that creativity can be seen as a reflection of an individual's creative intelligence, as the latter concerns not only the way the individual sees the world, but also his or her own beliefs. Indeed, he stresses that creative intelligence is different from general intelligence, as creativity focuses on how the individual thinks in order to achieve something new. To this he adds that creative intelligence characterizes four basic types of people, which are: a) The intuitive person, who is distinguished by hard work, determination and high motivation. b) The innovative person, who is characterized by perseverance, curiosity and experimentation. c) The imaginative person who is characterized by boldness, expression of new perspectives and independent thinking. d) The person who is inspired by everything and

characterized by understanding, communication and contribution to society.

Goldstein and colleagues (2015) studied creative intelligence and its relationship with innovative and unconventional problem solving through a series of studies. Initially, a sample of 80 people were given unconventional problems, such as predicting future situations involving different kinds of people, for example people who are born young and die young or people who are born old and die young, etc. Another sample of 60 people were given more conventional problems involving ratios, sequence completions and classifications. Through these studies it was found that creativity involves the following key elements: intelligence, knowledge, thinking, personality type and motivation. In addition, it was found that the creativity expressed by the people who participated in the survey was greater in cases where it referred to a field with which they were related or knowledgeable. A final conclusion that researchers came to was that creative intelligence tests outperform conventional intelligence assessment tests both in terms of the requirement of the individual's verbal skills and in terms of their ability to analyze ideas, generally tapping into skills beyond those assessed by conventional intelligence tests.

Rea (2003) in his attempt to interpret creative intelligence, uses the concepts of 'creativity' and 'intelligence' separately. He states that when creativity is isolated from intelligence, it is very likely to lead to speculation, whereas, when intelligence is isolated from creativity, the individual may be driven to a narrow way of thinking. Creative intelligence coordinates both the general intelligence and the creative extension of reality as the person perceives it. For the above mentioned, when there is a balanced interaction of creativity and intelligence, the individual manages to adapt intelligently to the demands of the environment and assimilate it creatively.

Continuing, as mentioned above, analytical, creative and practical intelligence are dimensions of human intelligence and play an important role in cognitive functioning. The existence of these three dimensions is an important principle of the theory of Successful Intelligence (Sternberg, 1999a) and can be taught and applied to different areas of life, as what varies from environment to environment is the cognitive content attributed to information (Sternberg et al., 2001). In particular, in addition to creative intelligence, which involves solving non-conceptual problems, analytical intelligence is used by the individual when he or she has to solve problems that require critical thinking. Practical intelligence is used by the individual in order to apply any knowledge acquired in daily life, at work or at home (Zmpainos & Antonopoulou, 2012). In fact, Sternberg and Grigorenko

(2004) state that both teaching and assessment should promote analytical, creative and practical intelligence so that students can exploit their potential, overcome obstacles and gain flexibility in their thinking.

Creative Writing

There is no precise definition of what creative writing is, as many interpretations have been given to the concept of creativity (Kotopoulos, 2012). In an attempt, therefore, to clarify the term, we could say that it is the understanding, exploration and recording of experience (Marshall, 1974), the re-creation of emotional experiences (Sharples, 1996), the spontaneous expression of thoughts and feelings (Gerard, 1996), the enhancement of imagination (Hooker, 1997), the organization and revision of ideas (Harmer, 2004), a discipline involving knowledge and techniques (Dawson, 2005), the original composition (Evernett, 2005), expressive art (O'Rourke, 2005), poetry, prose, drama (HMIE, 2006), a tool of various types of therapy (Morley, 2007), imaginative interpretation of the world (Bennett et al., 2008), intuition and personal memories (Maley, 2009), active engagement with reading and writing (Freiman, 2009), creating imaginative narratives (Nettle, 2009), developing thinking skills (Chen & Zhou, 2010), originality (Temizkan, 2011), the free expression of opinions and feelings (Oral, 2012), a field of research in psychology (Forgeard, Kaufman & Kaufman, 2013), the connection of new information with previous information (Demir, 2013), a kind of catalyst in discussions about cultural differences (Harper, 2014), self-expression in an imaginative way (Ghani & Din, 2017), and finally, creative writing is limitless, as it has the potential to accept all writers, asking them to be completely original (MacVean, 2016), while also being linked to all three aspects of literacy: the functional, the critical and the creative (Kiosses, 2019).

In education, the benefits of creative writing are manifold: a) It helps to develop language at all levels, including grammar, vocabulary and phonology. b) It encourages students to "play" with language, to experiment and explore without fear. c) It emphasizes the right side of the brain, emotions, intuition, musicality. d) It enhances students' self-confidence. e) It increases their motivation. g) It enhances their reading and writing skills (Maley, 2009). Stewart (2010) states that one of the advantages of creative writing is the enhancement of the 'personal voice' of students. For her, the author's 'voice' has the potential to 'reach' the reader, offering them an unexpected experience. The "voice" makes the text more compelling and therefore easier for the reader to understand. Additionally, Pawliczak (2015) argues that creative writing improves ways of thinking, as the individual resolves various issues,

rethinks issues that had been on their mind, achieves goals they had never achieved before, while Barbot and colleagues (2012) report that creative writing skills are directly related to the promotion of learning.
The term "creative writing workshop" refers both to the process of evaluation of the texts produced by the other participants of the workshop and to the physical space in which it takes place. The workshop emphasizes all stages of writing (pre-writing, writing, writing, post-writing or revision stage), encourages autonomy and collaboration among students, as the student is placed at the center of the process with the teacher acting as a guide and facilitator of learning (El Said, 2006. Harris & Hodges, 1995. Massengill, 2001. Pollington, 1999). According to AWP (Association of Writers and Writing Programs, 2012), in the context of the workshop, 'teaching' provides students with the following: (a) an overview of literature, (b) experience in critical analysis, (c) an understanding of a writer's techniques, (d) intellectual discipline, (e) an understanding of different cultural values, (e) creativity, (g) knowledge of grammar, (h) communication skills, and (i) an understanding of New Media. In addition, the methods used are as follows: (a) varied readings, (b) study of literary terminology, (c) study of critical approaches, (d) practice in critical reading, (e) practice in one author's technique, (g) peer review, (h) memorization, (i) practice in critical writing, (j) instructor comments, (k) practice in revision, (l) testing and evaluation, and finally, (m) experience with New Media Technology.

Enhancing creative intelligence in school through creative writing activities

Enhancing creative intelligence at school is an urgent need, as, even though school should function as a place to promote creativity, emphasis is still on conventional school performance (Dimopoulos, 2007). Quite often, the behavior of creative students is confused with that of the so-called 'troublemakers', is characterized as misbehavior, is punished and these students are marginalized (Xanthakou, 1998). In addition, Paraskevopoulos (2004) states that, despite the statements of school officials regarding a school focused on promoting children's creativity, everyday practices in classrooms are differentiated. Besides, written examinations that promote memorization, the extensive curriculum, and the lack of teacher training in enhancing creativity and creative intelligence act as inhibiting factors (Kamplylis et al., 2009).
According to the Triarchic Theory of Intelligence, achieving the coveted creativity in school requires the simultaneous utilization of all three aspects of students' intelligence, namely analytical, creative and practical. One could even argue that creative intelligence acts as a

bridge between analytical and practical intelligence, which, in other words, entails not only conceiving innovative ideas, but also evaluating their suitability and application in everyday practice (Sternberg, 1999a). In addition to the above, Sternberg and Grigorenko (2003) list some key words that could be used in teaching according to the Triarchic Theory of Intelligence: a) Enhancing analytical intelligence (indicatively): analyze, compare, explain, reason, know, study; b) Enhancing creative intelligence (indicatively): create, invent, imagine, guess, predict, devise; and c) Enhancing practical intelligence (indicatively): use, apply, participate, act. Examples of creative writing activities for the cultivation of creative intelligence are the following:

♣ Create a poem together with your students.

♣ Imagine what your life would be like if you lived at the North Pole and had an igloo for a home.

♣ Assume that the earth's temperature rises by 5 degrees Celsius. What effect would this have on our lives?

♣ Predict what your life would be like 30 years from now.

♣ Draw an alien and write a short story about it.

'An example of a creative writing activity in the light of the Triarchic Theory of Intelligence is the following:

1. Collect information from printed and digital material about what to do at the time of the earthquake (analytical intelligence).
2. Create a rhyming poem in a group context to render in rhyming speech some of the above ways of responding to the earthquake (creative intelligence).
3. Take part in earthquake drills and participate with your poems in public awareness campaigns on earthquake (practical intelligence).

Further, and as creative intelligence has been linked to problem solving, it is important to note that many studies have highlighted the use of creative writing activities as an educational tool in the problem solving process to improve creative thinking (Flower & Hayes, 1980; Harkow, 1996; Ryan, 2014). It should be stressed that while there is a wide variety of problem situations that can be presented to children, not all of them are suitable for enhancing creative intelligence. Goffin and Tull (1985) suggest the following questions to assist teachers in selecting appropriate problems for children to solve: a) Is the problem interesting? b) Can it be solved in many ways? c) Does the attempt to solve encourage the production of new ideas? d) Can the actions

leading to the solution be evaluated at the end? However, it is important to stress that, although the use of realistic problems over hypothetical ones enhances creativity to a greater extent (Sternberg & Lubart, 1991), the scenario should always have a storybook character, especially for young children (Xanthakou & Kaila, 2002).

Examples of creative problems that can be used as a stimulus for creative writing activities are the following:

♣ Imagine that suddenly the earth has lost all electricity for a month. Write down how your life would change and what you would do to survive.

♣ Pick two characters from two different books and have them fight. The reason may be, for example, which of the two suffered more or which had a happier life.

♣ Two or more people do something that is really stupid and get criticized by the animals. What exactly did they do and what are the animals' observations?

♣ Write about someone who is always getting in big trouble for being too honest.

♣ Your pet can only talk like a human at midnight for one hour. Write down what might happen.

To the above, it is worth adding the positive effect of play in enhancing children's creative intelligence. Through it they cultivate their imagination, as, particularly in social/dramatic play, they play a role and pretending to participate in a particular situation, they are asked to respond to the corresponding social context with the appropriate use of language and choice of actions (Smith, 2001). Moreover, through play they exchange information, think, and judge, discover new ideas and knowledge, observe, remember and compare (Antoniadis, 1994). On the other hand, creative writing approaches language and its potential in an experiential manner, combining play with learning (Paparousi & Tsilimeni, 2010). In fact, Maley (2009) states that one of the multiple benefits of creative writing is that it encourages students to 'play' with language, experiment and explore without fear.

Examples of playful creative writing activities that can help to enhance creative intelligence include the following:

♣ Write the longest word you can. Then write as many words as you can, using only the letters from the original word you wrote. With all those words you have written down, write a story.

♣ Invent characters that are made of strange materials (for example, Pinocchio is made of wood), describe their properties and tell their adventures.

♣ Write an acrostic with your name on it.

♣ Take a verse from a poet and rewrite it, changing syllables, word order, adding absurd phrases or images.

♣ Choose five words related to each other (for example: glass, table, soup, mother, apron) and five words completely unrelated (for example: yard, whale, school, beans, pillow, astronaut) and write a story with them.

To add to the above, as creative intelligence is an individual's ability to seek out new ideas, creative writing is the thinking, organizing and revising of those ideas (Harmer, 2004). Besides, O'Rourke (2005) also argues that the writer through activities creates his/her own imaginative world and is led to new meaningful ideas. Literary books, pictures, poems, works of art and films can be the inspiration for these activities. Examples of creative writing activities that contribute to the enhancement of creative intelligence and are inspired by a variety of texts and images are the following:

♣ *Literary texts*

- Give a literary text another ending.
- Change the setting of the story and write it in another place or time.
- Choose a hero and interview him or her.
- Write a new story, combining the literary passage with other literary texts of similar content.
- Send a letter to the author, expressing your feelings about the plot development.

♣ *Poetry*

- Rewrite a rhyming poem in free verse, removing the rhyme.
- Remove words from poems and add your own, being respectful of meaning and rhythm.
- Collect slogans, advertisements, store signs and other material and write poems that are humorous, satirical or dramatic.
- Write a boring poem, a poem with mixed Greek, French, German or English words, or write a very short poem.
- Make pairs of rhyming words and use them to write poems.

♣ *Images*

- Choose objects depicted in books, "bring them to life" and transform them into characters in a story.
- Choose a picture and write what has happened before and after the events in the picture.
- Write stories, using a painting, which can be the setting (place & time).
- Use two or more covers from picture books and write your stories.

Conclusions

One of the main purposes of the school is or should be to enhance students' creative thinking through inquiry, curiosity, perseverance, autonomy, discovery skills and the development of multiple information. It should be emphasized that for the development of creative intelligence, it is important to have a supportive school environment that motivates the motivation and enthusiasm, not only of the students, but also of the teachers themselves, as well as their creative behavior (Hennessey, 2007). It is important that teachers are given the freedom of expression, but also the necessary resources and organizational and administrative support to encourage their creativity. On the other hand, as far as children themselves are concerned, let us not forget that they are creative by nature and are impressed by unconventional things, even when they are not in a creative environment (Jackson et al., 2006). However, creative intelligence is not developed in schools to the extent it should be and usually remains at the level of intentions.

Creative writing can help to develop creative intelligence, as it enables not only the generation of new ideas, but also their capturing on paper. Creative writing is a way of understanding our experiences. Through poems, for example, we express our feelings, interpret our experiences and discover our emotional connection to the world. In other words, through the poetic and metaphorical representation of our experiences, we access those unconscious processes that help us make sense of what is around us (Keane, 2012). Besides, Kenny (2011) claims that the reasons why the use of creative writing in the classroom is considered necessary are freedom of expression, promotion of imagination, creativity, self-expression, emotional responsiveness, but also the connection between the known and the unknown, as creative writing can connect pre-existing knowledge with new ideas and unfamiliar language structures.

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RELATIONSHIP: SELF-ESTEEM - ACADEMIC ACHIEVEMENT - ARTISTIC ACHIEVEMENT OF MUSIC STUDENTS AFTER THE PANDEMIC YEARS

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Abstract: *The research aimed to investigate the relationship between the self-esteem of music students and their academic and artistic performance in both, the pre-pandemic period of Covid-19 and post-pandemic (N - 72 subjects and 78 subjects). Thus, in the year 2019, between self- esteem and academic results there is a positive correlation with a mean value of, r- .560 with p-0.01, and in the year 2022 there is a positive but, significant correlation with a much lower value, r- .261 with p-0.05. The same decrease was seen in the correlation between self-esteem and artistic achievement. This in 2019 had an average value of r- .567** with p-0.01 and in 2022, the correlation becomes insignificant with a value of r- .136. Between academic and artistic outcomes, in the year 2019 there is a positive correlation with a mean value of, .583**with p-0.01. In the year 2022, the correlation remains positive but with a reduced to half value, .258 with p-0.05. We can affirm that the Covid-19 pandemic was a factor that hindered the artistic development of the Music Faculty students.*

Key words: *self-esteem, academic results, artistic (musical) results, students Faculty of Music*

1.Introduction: is self-esteem important?

Self-esteem is a multidimensional and hierarchical psychological construct (Rentzsch, Wenzler, Schütz, 2016)that refers to a person's evaluation of his or her personal worth (Rosenberg, 1965). Self-esteem is related to similar notions such as merit, self worth and includes all of an individual's beliefs about him- or herself (Madsen, 2014). The best known form is global self-esteem: general, consciously accessible self-evaluation (Hepper, 2016), which refers to self-competence (Tafarodi, Swann, 2001). Most people have relatively high self-esteem, although levels vary throughout life and depend on experiences of interpersonal

acceptance. There are cultural (European-Canadian versus Asian-Canadian) and gender differences in the importance of self- esteem (Vaughan-Johnston, Jacobson, 2021).

Self-esteem is associated with important life outcomes such as: psychological adjustment, academic success, physical health and human relationships well-being. However, the extent to which self-esteem determines these outcomes remains controversial (Crocker, 2001; Jordan, Zeigler-Hill, Cameron, 2015).

1. Background

The importance of high self-esteem is frequently a debated topic in academic and public community, and the belief that self-esteem leads to good outcomes has been introduced as an individual impact difference variable (Vaughan-Johnston and Jacobson, 2021). Other researchers have demonstrated that academic self-actualization is both a cause and an effect of self-esteem (Marsh and Craven, 2006; Trautwein, et. al., 2006). Results from other studies have revealed a positive and significant relationship between self-esteem and academic achievement among students (Ghasemzadeh, et. al., 2012; Okoye and Onokpaunu, 2020) or claimed that self-esteem is a predictor of academic achievement (Pullmann and Allik, 2008; Moyano, Quílez-Robres, Pascual, 2020). The relationship between self-esteem and academic achievement of young adolescents in two Western cultural contexts was investigated: United States and England. Forboth samples, quantitative results demonstrated that decreases in self-esteem were related to multiple indicators of academic achievement in the following year. While country differences occur by the end of the school year, mathematics appears to have a consistent relationship withself-esteem in both country contexts (Zoller Booth & Gerard, 2011). On academic achievement, Erdinçn and Murat (2017) appreciated that academic performance has direct and interactive effects on self-esteem and in Rosli et al. (2012) research results showed that subjects with high self-esteem perform better in the academic environment ($p < 0.0005$, $r = 0.32$). The results of other research indicated that media multitasking was negatively correlated with academic performance, but not with self-esteem; the relationship between self-esteem and academic performance was reciprocal; and academic performance could mediate the relationship betweenmedia multitasking and self-esteem (Luo, Yeung, Li, 2020).

Positive effects on self-esteem were recorded as follows: cross-cultural relations and teacher interest positively predicted academic self-concept and self-esteem (Oczlon, Bardach, Lüftenegger, 2021); self-esteem, goal-directedness components (mastery, approach performance, and avoidance performance), and academic achievement were correlated ($p < 0.05$) (Rahmani, 2011); social development goals influenced students with low self-esteem against negative emotions and amplified positive emotional experiences, in contrast, social avoidance goals were particularly detrimental for students with low self-esteem (Shim, Wang, Cassady, 2013).

Di Giunta et al. (2013) research showed how conscientiousness, openness, and self-esteem were positively correlated, with both traits and self-esteem increasing students' perceived academic self-efficacy, which in turn mediated the effect of conscientiousness and self-esteem on students. Self-esteem also fully mediates the relationship between social support and academic achievement and the relationship between social support and emotional exhaustion (Li et al., 2018) and mediates relationships between procrastination and well-being. Moreover, the indirect effect of procrastination on well-being by mediating self-esteem may vary with academic achievement (Erdinç and Murat, 2017). Students' cognitive abilities seem to have a direct influence on their academic performance. That is, those students who have better executive performance usually achieve better grades/grades. In addition, self-esteem seems to play a moderating role between cognitive skills and academic performance (Cid-Sillero, Pascual- Sagastizabal, Martínez-de-Morentin, 2020). There is also research that does not support the link between self-esteem and academic achievement: self-esteem is only weakly related to behaviour and objective outcomes such as academic achievement, physical attractiveness and popularity (Crocker, 2001) or Baumeister et al. (2003) who conclude that self-esteem - the global component of self-concept - has no effect on subsequent academic performance/accomplishment (Zuffiano et al., 2013; Jenaabadi, 2014).

How does music help? Attending an instrumental music program increases the academic achievement of a student with special educational needs and self-esteem also changes positively (Surrency, 2001). The active involvement of music students in music making has led to the following findings: (1) music making can be realized as a musical act - it has allowed participants to deepen their musical knowledge and understanding; (2) music making can also be seen as a social act - where subjects felt they were active contributors to a

group outcome, developed a strong sense of belonging, gained popularity and made friends who shared the same concerns, enhancing social skills and building a strong sense of self-esteem and satisfaction and (3) music influences the self in terms of developing personal skills, facilitating students' personal identity and encouraging the development of self-actualization, self-confidence and intrinsic motivation (Kokotsaki and Hallam, 2007). The positive effect of music classes conducted in high schools on self-esteem, general self-esteem for younger subjects and academic self-esteem for older students is known (Rickard, et al., 2012). Do students who perform music perform better academically than others? Results from a 2013 research study confirmed this hypothesis: students who study music have better academic outcomes/grades/grades in all subjects (Cabanac et.al., 2013). The results of another research showed that piano instruction had a positive effect on subjects' self-esteem, but did not influencetheir academic achievement in mathematics and language as measured by standardized tests (Costa-Giomi, 2004). Another research makes an important point: averaging by academic achievement was significant only for academically gifted students, while averaging by academic engagement was significant only for artistically gifted students (Lee, Jones, Day, 2017).

There is a significant difference observed between self-esteem among male and female students (Ghasemzadeh et. al., 2012). Academic achievement and self-esteem did not have a significant positive correlation when taken together in male students and female students respectively. There was a significant correlation between self-esteem and academic achievement of male students, but there was no significant correlation between female students' self-esteem and their academic achievement (Khan, Mahmood, Zaib, 2019). Other research has also found that female participants had lower levels of self-esteem than male participants (Saadat, Ghasemzadeh, Soleimani, 2012; Araujo and Lagos, 2013; Rentzsch, Wenzler, Schütz, 2016; Brase & Dillon, 2022). However, there is also research to the contrary: female students' self- esteem is higher than that of male students (Jenaabadi, 2014); girls had significantly higher levels of achievement and expectations of success than their male peers (Skaalvik, 1990). If we refer to the gender perspective for musical success, a significant difference was found in favour of male students (Demirsöz, Kocabaş, 2009). But, the results of other research showed significant differences ($p < .01$) in musical self-esteem for the gender factor - the mean score of females being higher (Kokotsaki and Hallam, 2007).

2. Methodology

The research aimed to examine the relationship between the self-esteem of music students and their academic and artistic performance, respectively, in the period before the Covid-19 pandemic and after the pandemic. The questionnaire survey was one of the methods used in the research, the second one was the psychological testing method The research instruments were: the questionnaire constructed by analyzing the results of a qualitative approach and the Rosenberg Self-Esteem Scale. For the construction of the first instrument, a focus group with experts in the field of music (teachers, prestigious performers) was conducted. The questionnaire had two dimensions: academic results and artistic results. The first dimension tracked academic results (average grade point average and satisfaction with it). The second dimension concerned: results at artistic events, such as international and national master classes, international and national prizes, international and national concerts, and study and practice mobility. The questionnaire was developed and validated specifically for this research (Cronbach's Alpha test value is .518, which indicates a medium consistency of the instrument used).

Data were collected from June-July 2019 and June-July 2022 respectively. Consent was obtained prior to the application of the instruments, with subjects being explained the purpose of the research, research methods and instruments, associated risks, and the rights they had as a research participant. Participants were assured of data confidentiality. On average, completion of the questionnaire and Rosenberg Scale took 10-15 minutes per participant.

The groups of participants had 72 subjects respectively 78 subjects, all of them being students and master students of the Faculty of Music of Transilvania University from Brasov - Romania. If we look at the first group of subjects from an age perspective, the majority of the subjects are aged between 21-25 years, more precisely 52 subjects (72.2%), followed by 13 subjects (18.1%) aged under 20 years; 4 subjects (5.6%) aged between 26-30 years and 3 subjects (4.2%) aged over 35 years. In terms of subjects' age, the second group had the majority of subjects aged between 21-25 years (64.1% - 50 subjects), followed by those aged under 20 years and over 35 years respectively (12 subjects - 15.4%) and finally those aged 26-30 years and 30-35 years respectively (2 subjects - 2.6%).

Group analysis criteria	Group 2019 - N-72		Group 2022-N-78	
	frequency-proven	frequency-proven	frequency-proven	frequency-proven
Gender of subjects	Female	male	Female	male

	45-62.5%	27-37.5%	50-64.1%	28-35.9%
Family and growth Environment	Urban	rural	Urban	rural
	47-65.3%	25-34.7%	50-64.1%	28-35.9%
Job - related to music (singing/music teachers/at the Popular School of Arts, employees of the Opera/opera theatres, orchestras)	From	nu	From	Nu
	23-32.9%	49-68.1%	26-33.3%	52-66.7%
Marital status	Single	married	Single	Married
	69-95.8%	3-4.2%	68-87.2%	10-12.8%

Table 1. Characterization of subject groups

Of those who work, in the case of the first group, most (9 subjects - 12.5%) have between 1 and 3 years of working experience, followed by 6 subjects (8.3%) with less than one year of experience, between 4 and 6 years of experience and only one subject (1.4%) with more than 20 years of experience. The situation is different for the second group: most of them, 14 subjects

- 17.9%, have been working for 1-3 years, followed by those with more than 20 years (8
- subjects 10.3%), those with less than 1 year (7 subjects - 9%), those with 4-6 years and 16-20 years (2 subjects - 2.6%) and finally those with 7-10 years (1 subject - 1.3%). If we look from the perspective of place of work, for the first group, most of those working, 6 subjects (8.3%) are teachers at music high schools, 4 subjects (5.6%) are teachers at music school (grades I-VIII), 3 subjects (4.2%) play in a band in restaurants/bars and 2 subjects (2.8%) are employed at the opera or at the Folk Art School. For the second group, most of those working, 14 subjects - 18.2% are music/singing teachers at general schools/music high schools/afterschools/Popular School of Arts, then 9 subjects - 11.5% are not working in music, 7 subjects (9%) are playing in opera houses/radio orchestra and 5 subjects (6.4%) are playing in a band in restaurants/bars.

3. Results

We begin the investigation of the research with this objective: "to analyze the relationship between the level of self-esteem and academic and artistic results in music students and this includes, master program students. If in 2019 it is found that there are Spearman correlations, of medium value, between self-esteem and academic results obtained (see, Ghasemzadeh, et. al., 2012; Okoye, Onokpaunu, 2020), in the year 2022, things changed and not in a positive way. Thus, in the year 2019, between self- esteem and academic results there was a positive correlation with a mean value of, .560 with p- 0.01, and in the year 2022

there is a positive but, significant correlation with a much lower value, .261 with p-0.05. The same decrease is recorded for the correlation between self-esteem and artistic achievement. This in 2019 had a mean value of .567** with p-0.01 and in 2022, the correlation is insignificant with a value of .136. Between academic and artistic results, in the year 2019 there is a positive correlation, with a mean value of, .583** with p-0.01 (Cabanac et.al., 2013). In the year 2022, the correlation remains positive but with a halved value, .258 with p-0.05. We can affirm that the Covid-19 pandemic was a factor that hindered the artistic development of the students of the Faculty of Music.

Referring to the academic results (average of the last semester), we note that they increased very little in 2022 compared to 2019. Thus if we look at the first range of averages - between

9.50 - 10.00 - they increased slightly, from 31.9% (23 students) in 2019, to 32.1% (25 students) in 2022; for the second range of averages - 9.49 - 9.00 - we observe the same slight increase, from 22.2% (16 students) to 23.1% (18 students); also a slight increase was recorded for the range of averages 8.50 - 8.99, from 16.7% (12 students) to 20.5% (16 students) respectively the range of averages 8.00 - 8.49, from 16.7% (12 students) to 17.9% (14 students). Under these conditions it was expected that the last range, the one with averages below 8.00, would show adecrease, i.e. from 12.5% (9 subjects) in 2019 to 6.4% (5 subjects) in 2022.

Satisfaction with academic results is generally high for both years surveyed. The degree of satisfaction with academic results is of course high and very high for students with good and very good academic results (averages between 9.00-10.00), there are however 3 subjects (4.17%) of those with results between 9.00-9.49 who are slightly dissatisfied, in 2019 and in 2022, only one is dissatisfied (1.28%). Interestingly, many of the students with poor academic results, below 8.00 (66% in 2019 and 60% in 2022) are satisfied with their results. Could we be talking about a false self-sufficiency?

When it comes to self-assessment of academic performance, only 9 out of 72 subjects (12.51%)say that their academic performance is very good for 2019. The situation remains somewhat thesame for the year 2022, when 12 subjects (15.38%) state that their academic performance is very good. For the year 2019, demanding are the 2 subjects (2.78%) with academic performancebetween 9.00-9.49 who self-assess their performance as not very good. In the year 2022, we did not record situations similar to the one presented above. At the opposite pole, in 2019, students with academic results below 8.49 (15 subjects - 20.83%) self-assess themselves as good, only 1 student (1.39%) self-assess themselves as not very good and 1 subject (1.39%) aspoor. For the year 2022, 5 students (6.41%) of those with academic results below 8.49, self- assess them as

less good (2.56% - 2 students) and poor (1.28% - 1 student). Shall we raise an unrealistic self-assessment of the latter?

Looking at the mean values within artistic outcomes, we find that they have improved slightly for all aspects investigated except for practice mobilities. A possible explanation could be that various competitions, master classes could also be organized online if physically they could not but practice mobilities less so. From the table below (Table 2), looking analytically we observethat the highest average was (2019) and is (2022) recorded by national concerts: 2.33 with a standard deviation of 0.277 respectively, 2.83 with a standard deviation of 2.698. If in 2019 thenext highest value was held by national master class attendance: 1.70 with a standard deviationof 0.143, in 2022 national awards are next highest with an average of 1.91 and a standard deviation of 2.261. Again there is a reversal, in 2019 the national awards follow with an averageof 1.69 and a standard deviation of 0.277, in 2022 the national master class participations are next: average of 1.73 with a standard deviation of 1.306. The lowest mean values are recordedby international awards 1.08 with a standard deviation of 0.043 and study mobility with a meanof 1.02 and a standard deviation of 0.027, for 2019. For the year 2022, study mobility (mean1.11 and standard deviation .644) and international awards (mean 1.10 and standard deviation .444) are at the bottom.

No.	**ACTIVITIES**	**Mean 2019**	**Std. deviation**	**Mean 2022**	**Std. Deviation**
1	International Master Class	1.27	.086	1.39	.944
2	National master class participation	1.70	.143	1.73	1.306
3	International Awards	1.08	.043	1.10	.444
4	National Awards	1.69	.205	1.91	2.261
5	International concerts	1.36	.124	1.53	1.202
6	National concerts	2.33	.277	2.83	2.698
7	Study mobility	1.02	.027	1.11	.644
8	Practical mobility	1.41	.147	1.19	.883

Table 2. Mean values for students' artistic results

A look at the relationship between self-esteem and academic results (see Table 3) leads us to state: most subjects with medium and high self-esteem place themselves with academic results in the range of grades 9.00 and 10 (26 subjects - 35.88% have medium self-esteem, respectively 3 subjects - 4.14% have high self-esteem - year 2019). The situation is maintained in the same parameters for the year 2022 (24 subjects - 30.76% have medium self-esteem, respectively 4 subjects - 5.12% have high self-esteem). Only 10 subjects (13.80%) have low self-esteem level, they have school results above 9.00 - year 2019, respectively 2 subjects (2.56%) have low self-esteem level, they have school results above 9.00. The research was continued, comparing self-esteem and academic results of music students from a gender perspective. Thus, for the year 2019, girls are better distributed in the range of grades 9.50-10: 28.89% (medium level of self- esteem), only 4.44% of them having high level self-esteem and 4.44% having low level self- esteem. On the same 9.50-10 score range, boys score almost 10% lower, i.e. 18.5% are placed at the medium level and 3.7% at the high level of self-esteem, with no value for the low level of self-esteem (see Table 2). In the year 2022, the situation changes. Boys are better distributed across the 9.50-10 score range: 28.57% (medium level of self-esteem), with only 3.57% of them having high level self-esteem and none having low level. On the same 9.50-10 score range, girls score almost 9% lower, i.e. 20% are placed at the medium level and 4% at the high level of self-esteem respectively, 8% at the low level of self-esteem.

Gender of subjects			**2019 -** Self-esteem			**2022 -** Self-esteem		
			over 36	between 30-36	between 13 - 29 *	over 36	between 30-36	between 13 - 29 *
Female	Academic results	between 9,50 - 10	4.44 %	28.89 %	4.44%	4%	20%	8%
		between 9,00 - 9,49	0	11.11 %	13.33%	0%	8%	16%
		Between 8,50 -	0	11.11 %	4.44%	2%	16%	10%

		8,99						
		between 8,00 - 8,49	0	0	13.33%	2%	4%	4%
		under 8,00	0	2.22%	6.67%	0%	0	6%
	Total		**4.44 %**	**53.33 %**	**42.21%**	**8%**	**48%**	**44%**
		between 9,50 - 10	3.7%	18.5%	0	3.57 %	28.57 %	0%
		between 9,00 - 9,49	0	11.1%	7.4%	3.57 %	7.14%	10.71 %
Male	Academic results	Between 8,50 - 8,99	0	11.1%	7.4%	0%	7.14%	0%
		between 8,00 - 8,49	0	11.1%	11.1%	0%	7.14%	0%
		under 8,00	0	0	18.5%	0%	21.42 %	10.71 %
	Total		**3,7 %**	**51.8%**	**44.4%**	**7.14 %**	**71.41 %**	**21.42 %**
		between 9,50 - 10	4.14 %	24.84 %	2.76%	3.84 %	23.07 %	5.12%
		between 9,00 - 9,49	0	11.04 %	11.04%	1.28 %	7.69%	14.10 %
Total	Academic results	Between 8,50 - 8,99	0	11.04 %	5.52%	1.28 %	12.82 %	6.41%
		between 8,00 - 8,49	0	4.14%	12.42%	1.28 %	10.25 %	6.41%
		under 8,00	0	1.38%	11.04%	0%	0%	6.41%

Total	**4.14 %**	**52.44 %**	**42.78%**	**7.68 %**	**53.83 %**	**38.45 %**

Table 3. Academic outcomes - self-esteem, gender perspective
*-note that on the 0-12 range of self-esteem there were no subjects

For 2019, the Spearman correlation calculated between self-esteem level and academic achievement is a significantly positive one of medium level, for girls, .541** with p-0.01 and for boys it is a high correlation, exceeding that of girls being, .622** with p-0.01. For the year 2022, the Spearman correlation value is a significantly positive medium level, for boys .451* with p-0.05 while for decreased, becoming a non-significant correlation, r- .179 (see Saadat, Ghasemzadeh, Soleimani, 2012; Araujo and Lagos, 2013; Rentzsch, Wenzler, Schütz, 2016; Brase and Dillon, 2022).
If we look at artistic outcomes and self-esteem (See Table 4), we can see how high and medium levels of self-esteem record the highest values of artistic outcomes, for both years investigated: 56.58% - 41 subjects (2019), respectively 61.44% - 48 subjects (2022). For the year 2019, self-esteem correlates significantly positively with artistic outcomes: positive, medium-level Spearman correlation with a .567** value at a p-0.01, but this is not repeated in 2022. Comparing girls and boys, we observe that in 2019, the results are significantly in favor of girls for the three levels of self-esteem (see Table 3). For the year 2022, the situation changes in favor of boys. For the year 2019, the Spearman correlation calculated between the level of self-esteem and artistic results is a positive one, for girls, being a medium level .524** with p- 0.01 and for boys it is a correlation that exceeds the medium level and exceeds that of girls being, .627** with p-0.01. For the year 2022, the correlations between the same variables are insignificant.

			over 36	between 30-36	between 13-29	over 36	between 30-36	between 13-29
		201-300 awards	0	1s.-2.22%	0	0	2s.-2%	0
		101-200 awards	0	2s.-4.44%	0	0	4s.-8%	0
	Awar awards ds	76-100	0	1s.-2.22%	1s.-2.22%	0	2s.-4	2s.-4%
		51-75	2s.-4.44%	0	0	0	0	0
awardsFemale awards		score6-10	0	1s.-2.22	2s.-4.44%	0	02s.-4%	4s.-8%
		1-5 awards	0	17s.-	4s.-	0	5s.-10%	4s.-8%

		no prize	0	37.74% 2s.-4.44%	8.88% 12s.-26.64%	4s.-8%	9s.-18%	12s.-24%
	Total		**2s.-4.44%**	**24s.-53.28%**	**19s.-42.18%**	**4s.-8%**	**24s.-48%**	**22s.-44%**
Awards	26-50 awards	76-100 awards	0	1s.-3.7%	0	0	2s-7.14%	0
Male awards	11-25 awards score	6-10	0	1s.-3.7%	0	0	1s.-3.57%	0
		1-5 awards no prize	0	3s.-11.1%	0	0	2s.-7.14%	0
	Total		0	1s.-3.7%	0	0	2s.-7.14%	0
		201-300 awards	0	6s.-22.2%	1s.-3.7%	0	9s.-32.13%	2s.-7.14%
		101-200 awards	1	2s.-7.4%	11s.-40.7%	2s - 7.14 %	2s.-7.14%	6s.-21.42%
		76-100 awards	**1s.-3.7%**	**14s.-51.8%**	**12s.-44.4%**	**2s.-7.14 %**	**18s.-64.26%**	**8s.-28.56%**
	Awards score	51-75 awards	0	1s.-1.38%	0	0	2s.-2.56%	0
		26-50 awards	0	2s.-2.76%	0	0	4s.-5.12%	0
Total		11-25 awards	0	2s.-2.76%	1s.-1.38%	0	4s.-5.12%	2s.-2.56%
		6-10 awards	2	0	0	0	0	0
		1-5 awards	0	1s.-1.38%	0	0	1s.-1.28%	0
		no prize	0	3s.-4.14%	0	0	2s.-2.56%	0
	Total		0	2s.-2.76%	2s.-2.76%	0	4s.-5.12%	4s.-5.12%
			0	23s.-31.74%	5s.-6.9%	0	14s.-17.92%	6s.-7.68%
			1s.-1.38%	4s.-5.52%	23s.-31.74%	6s.-	11s.-14.08%	18s.-23.04%
			3s.-4.14%	**38s.-52.44%**	**31s.-42.78%**	**6s.-7.68%**	**42s.-53.76%**	**30s.-38.40%**

Table 4. Artistic achievement score (awards) - self-esteem, gender perspective

For the year of 2019, the forms of artistic achievement and self-esteem correlates significantly positively, on average levels with: national master classes (.577**), international awards (.402**) and national awards (.434**). For 2022, there is no significant correlation. For the year 2019, the presence of awards in the independent samples t-test obtained: t = -

1.761, p = .043. The significance threshold is less than 0.05 which means that the difference is statistically significant. So, there are gender differences in the presence of awards (the mean of boys exceeds that of girls, 1.51 versus 1.31) (see, Demirsöz, Kocabaș, 2009). For the year 2022, the number of awards in the t-test for independent samples had the value t=-0.828, p=0.016. The significance threshold being less than 0.05 means that the difference is statistically significant. So, there are gender differences in the number of awards (boys' mean exceeds girls' mean, 7.67 versus 7.22).

If we also extend the analysis between academic and artistic results, for 2019, within the two groups, girls and boys, it is observed that girls with academic results above 9.00 achieve more artistic results, compared to their male peers. Of the girls with grades above 9.00, more than half, 25 girls (55.25%) report artistic results compared to 33.33% (9 subjects) of the boys with grades above 9.00 (see Fig. 1 and Fig.2).

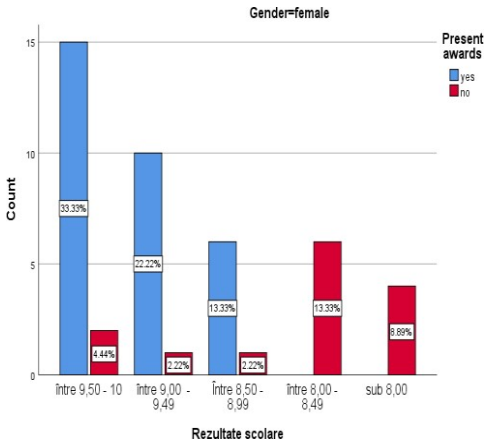

Fig. 1 Relationship between academic results and artistic results, female gender, 2019

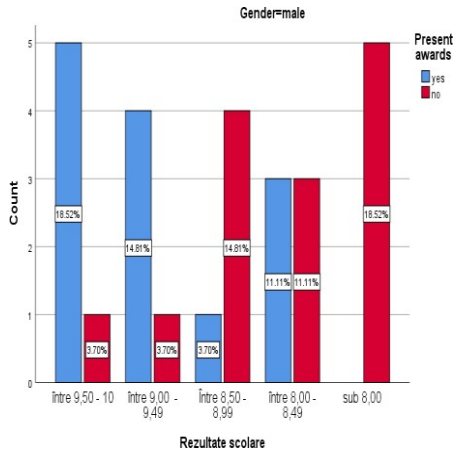

Fig. 2 Relationship between academic results and artistic results, male gender, 2019

If we look at the same situation but for the year 2022, we see that the percentages are equalised, with both girls and boys registering approximately the same percentages: 32% - girls and 32.14% - boys (see Fig. 3 and 4).

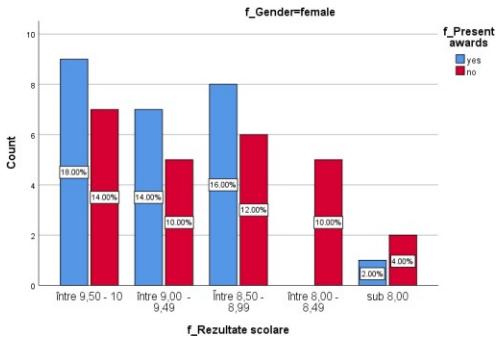

Fig. 3 Relationship between academic results and artistic results, female gender, 2019

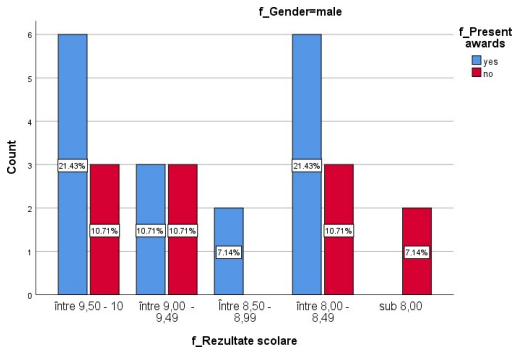

Fig. 4 Relationship between academic results and artistic results, male gender, 2022

4. Conclusions

The research aimed to: analyze the relationship between the level of self-esteem and academic and artistic performance in music students and master students. From the results obtained, if in the year 2019 it was found that there was a Spearman correlation, of medium value, between self-esteem and academic results (see, Ghasemzadeh, et. al.,

2012; Okoye, Onokpaunu, 2020) obtained, in the year 2022, things changed and not in a positive way. Thus, in the year 2019, between self-esteem and academic results there was a positive correlation with a mean value of, .560 with p-0.01, and in the year 2022 there is a positive but, significant correlation with a much lower value, .261 with p-0.05. The same decrease was seen in the correlation between self-esteem and artistic achievement. This in 2019 had a mean value of .567** with p-0.01 and in 2022, the correlation becomes insignificant with a value of .136. Between academic and artistic results, in the year 2019 there is a positive correlation (see, Cabanac et.al., 2013), with a mean value of, .583** with p- 0.01. In the year 2022, the correlation remains positive but with a halved value, .258 with p-0.05. We can affirm that the Covid-19 pandemic was a factor that hindered the artistic development of the students of the Faculty of Music.

For 2019, the Spearman correlation calculated between self-esteem level and academic achievement is a significantly positive one of medium level, for girls, .541** with p-0.01 and for boys it is a high correlation, exceeding that of girls being, .622** with p-0.01. For the year 2022, the Spearman correlation value is a significantly positive medium level, for boys .451* with p- 0.05 while for decreased, becoming a non-significant correlation, r- .179. For the year 2022, the Spearman correlation value is a significantly positive one of medium level, for boys .451* with p- 0.05 (see, Saadat, Ghasemzadeh, Soleimani, 2012; Araujo and Lagos, 2013; Rentzsch, Wenzler, Schütz, 2016; Brase and Dillon, 2022) while for decreased, becoming a non-significant correlation, r- .179. For the year 2019, self-esteem correlates significantly positively with artistic achievement: positive, medium-level Spearman correlation with a value of .567** at a p-0.01, but this is not repeated in 2022. Comparing girls and boys, we observe that in 2019, the results are significantly in favour of girls for the three levels of self-esteem. For the year 2022, the situation changes in favour of boys. For the year 2019, the Spearman correlation calculated between the level of self- esteem and artistic results is a positive one, for girls, being a medium level .524** with p-0.01 and for boys it is a correlation that exceeds the medium level and exceeds that of girls being, .627** with p-0.01 (see, Demirsöz, Kocabaș, 2009). For the year 2022, the correlations between the same variables are insignificant. For the year 2019, the presence of awards in the independent samples t-test obtained: t= -1.761, p = 0.043. The significance threshold is less than 0.05 which means that the difference is statistically significant. So, there are gender differences in the presence of awards (boys' mean exceeds that of girls, 1.51 versus 1.31). For the year 2022, the number of awards in the independent samples t-

test had a value of t=-0.828, p=0.016. The significance threshold being less than 0.05 means that the difference is statistically significant. So, there are gender differences in the number of awards (boys' mean exceeds girls' mean, 7.67 versus 7.22). The results provide a better understanding of the self-esteem factor that has a significant effect on students' academic and artistic achievement. It can be recommended among other things that Music faculty management together with psychological counsellors should design and run flexible programs for students' self-esteem awareness and improvement.

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LOSING STEAM: THE DEMISE OF THE "JAPANESE DREAM" AMONG PROSPECTIVE INTERNATIONAL STUDENTS

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Abstract: *Much like immigration, reasons to study abroad often relate to push and/or pull factors. Although attractive programs and courses can be major pulls for some prospective international students, financial matters such as tuition, living costs, and pathways to employment also have a significant influence. Since 2010 when Japan's Ministry of Education, Culture, Sports, Science and Technology (MEXT) initiated projects and activities to promote the internationalization of universities, the number of inbound international students in Japan was steadily increasing, most of which were coming from East and Southeast Asia. This trend continued up until around 2018, and, understandably, rapidly declined in the wake of the COVID-19 pandemic and implementation of rigid border restrictions. While the pandemic undoubtedly played a major part in this downtrend, one cannot overlook the fact that enrollments and interest in studying in Japan was already losing steam. With its university rankings increasingly losing out to competitive universities in China and Singapore and its relatively low entry-level salaries amid a long-term recession, which has further been exacerbated by the weakened yen, the "Japanese dream" is arguably past its prime. While taking into account the contextual factors which influenced this trend, my study involved a critical discourse analysis of MEXT's ambitious plan to somehow reverse this trend by bolstering further internationalization, attracting highly-skilled foreign talent and essentially saving a sinking ship. The findings from this study may give institutions in the education and employment sectors an opportunity to reassess their current support systems and programs for lucrative foreign talent.*

Keywords: *internationalization; education policies; discourse analysis; higher education*

1. Introduction

Although impacted by the pandemic in early 2020, the flow of international students, for the most part, has been growing exponentially. According to UNESCO's findings, student mobility numbers doubled from 2000 to 2015, and this is also expected to bifold by 2025 (Guruz, 2011). In a European context, this has been easily enabled by the Erasmus+ programme. However, for non-EU based tertiary-level students, study abroad opportunities are often provided through one's university's exchange partnership agreements, whereby credits from classes taken abroad can be smoothly transferred to one's total credits. As a convenient and comfortable option, this is an attractive option for students wishing to venture abroad for a semester or two. For others with different motivations or aspirations, the so-called "degree-seeking" students, reasons to study at a specific university or in a specific country often relate to push and/or pull factors. Although specific degrees or courses with career paths can be major pulls for some international students, financial matters such as tuition, living costs, and pathways to employment also have a significant influence. Aware of its ageing and dwindling population (and therefore a lack of human resources), since at least the late 1990s, Japan started heavily investing in attracting international students and for a while, it worked. Since 2010 when Japan's Ministry of Education, Culture, Sports, Science and Technology (henceforth abbreviated to 'MEXT') initiated projects to promote the internationalization of universities, the number of inbound students in Japan was steadily increasing, most of which were coming from East and Southeast Asia. This continued until around 2018, and then rapidly declined due to the COVID-19 outbreak and subsequent border restrictions. Naturally, the pandemic played a significant role in this downtrend, but enrollments and interest in studying in Japan were already losing steam. With its university rankings increasingly losing out to competitive universities in neighboring countries like China and Singapore, and its relatively low entry-level salaries amid a long-term recession, (which has further been exacerbated by the weakened yen), the "Japanese dream" for most of these East/Southeast Asian students is arguably past its prime. While taking into account the contextual factors which influenced this trend, my study looks at the rhetoric in MEXT's ambitious plan to somehow reverse this trend by heavily investing into internationalization at higher education institutions, and thereby attract highly-skilled foreign talent to save a sinking ship. The findings and discussions from this paper may give institutions in the education and employment sectors an opportunity to reassess their current support systems and programmes for highly lucrative foreign talent.

2. Context and media discourse

Thanks to the weakened yen and booming tourism industry, tourism studies and statistics paint a rather positive picture of international visitors to Japan. Major news outlet Reuters even reported that in spite of the record heat wave in mid-July 2023, "travelers are pouring in, taking advantage of a slide in the currency that has made holidays the cheapest in decades" (Kajimoto & Swift, 2023). While travelers are pouring in and, in turn, pumping money into the economy, they are impermanent. Naturally, this is unsustainable as a major source of revenue for the country. People need to come, stay, spend, and contribute— and this is where international students step in and serve an important role. As previously noted, the number of international students was steadily increasing until 2018, but then the influx started to stall. Understandably, a range of factors have influenced the trend, but the recent lack of economic growth, and endless media reports on Japan's dismal work conditions and culture of excessive overtime work cannot be overlooked. International and even domestic media reports seem to repeat the same rhetoric about the poor conditions for foreign workers and the brain drain of talent in Japan. Take, for example, a sample of headlines and excerpts from the following reports about Japan's higher education and employment issues since 2018 (Table 1 below).

Media Outlet/Source	**Headline**	**Excerpt/Lead**
Asahi Shimbun (Japan) (May 10, 2023)	Foreign students trying to work in Japan met with high hurdles	" 'Foreign students alone are usually blamed for not being able to find a job, in some way,' she said. 'That extinguishes their enthusiasm'. Foreign students are valuable resources in Japan as it is going through a labor shortage, observers said"
Japan Times (Japan) (Jun.22, 2022)	Will a ¥10 trillion fund be the savior of Japan's universities?	" 'Global performance will require much greater global engagement, not just bringing in foreign students, but acting like an international place in the middle of Japan,' he said. 'There are great foreign students in Japanese universities, but they're kind of on the side' "
Nikkei Asia (Japan) (Dec.22, 2020)	Japan losing global talent race, Suga economic adviser warns	"Japan's inability to attract foreign employees despite years of globalization efforts damages the country's financial services sector and other fields crucial to future growth"
Nikkei Asia (Japan) (Jan.3, 2022)	Japan misses foreign talent as companies seek strong linguists	"Many Japanese companies are missing out on opportunities to employ highly qualified foreign nationals with valuable skills because of their insistence that recruits have high Japanese skills"
Nikkei Asia (Japan)	Japan weighs longer stays for	"Move aims to boost competitiveness by easing job

(Jan.22, 2022)	world's elite college graduates	hunting for skilled foreigners"
Nikkei Asia (Japan) (Jun.22, 2022)	Now admitting: Japan aims to regain 300,000 foreign students	"The number of international students in Japan slid from more than 310,000 in fiscal 2019 to 242,000 in fiscal 2021. The drop was even deeper for Japanese students going overseas, from about 107,000 in fiscal 2019 to 1,400 in fiscal 2020"
Nikkei Asia (Japan) (Nov.5, 2022)	Without internationalization, Japanese higher education is sinking	Keenness for English "has helped China's institutions of higher education continue to rise in global rankings while Japan's slide"
Nippon.com (Japan) (Aug.16, 2022)	Restarting International Study in Japan in the Post-COVID Era	"The falling number of international students and the declining proportion of international students finding work in Japan after graduation is likely to have a negative impact in many ways, hampering companies' ability to expand overseas and develop products for overseas markets, and making it harder for the country to attract inbound tourists and secure the necessary human resources in fields like nursing care"
Kyodo News (Japan) (Dec.31, 2022)	Japan ranks 41st in attracting talent in 2022: Swiss Survey	"Japan ranked 41st out of 63 economies in 2022 in attracting and retaining foreign talent, down two spots from a year earlier and the fourth straight year in decline"
The Mainichi (Japan) (May.7, 2019)	'Life has become so hard': Nepali student's suicide shows problems of Japanese dream	"In a survey Gyawali carried out in 2018 on 353 foreign students, 198 (56%) said they suffer from stress caused by financial concerns, while some 115 (33%) of respondents feel anxiety from having no one to help them here"
Asia Times (International) (Dec.31, 2021)	Japan pays a high price as it goes down market	"Japan is becoming a "cheap" country in terms of, not just its prices, but also its human resources. It has abysmally low starting salaries for graduates, and – exacerbating existing labor shortages – is facing a brain drain […] Japan is on course to becoming a poor nation, dependent on tourism, where the young and brightest minds leave the country for better jobs with better pay"
Deutsche Welle (International) (Aug.12, 2022)	Japanese universities losing battle with foreign rivals	"A shrinking population, fewer foreign students, falling government support and greater overseas opportunities pose serious challenges for tertiary education in Japan"
The Washington Post (International) (Nov.1, 2022)	Japan asks if it's better to flip burgers than work at a megabank	"The situation has some fretting about the risk of a brain drain, as the young go in search of opportunities abroad. Conversely, the health-care and construction workers that Japan has been trying to coax from overseas may find the country a less attractive destination when they calculate how much their wages are worth back home"

Table 1. Media reports concerning education and employment

Without performing a full discourse analysis, it is clear that reports have not been favorable and perhaps that the future looks bleak for Japan's efforts to attain and retain foreign students and talented human resources. A simple sentiment analysis of the Table 1's corpus using the discourse analysis and text mining tool *User Local* also reinforced that the texts were overwhelmingly negative in tone and leaned towards expressions of anger (see Figure 1).

Figure 1. *Sentiment analysis of media reports*

It must be noted, however, that it is difficult to make sweeping generalizations from such a small sample size. Furthermore, the tendency of news outlets to emphasize and capitalize on the mantra "bad news is good news" must also be taken into account. In any case, the major issues at hand based on the sample are: 1) Japan's decline in global competitiveness, 2) Japan's problems with attracting international students, and 3) Japan's problem with securing and retaining human resources.

Part of the problem is that Japan is facing a population decline due to the ageing population and low birth rate. This has naturally resulted in a strained welfare system, lack of human resources, and therefore lack of global competitiveness in business. After the bubble economy went bust in the late 1990s, Japan struggled to attract foreign talent, so it revised its system for accepting international students in the early 2000s. In 2008 MEXT introduced the Global 30 which aimed to increase the number of international students in Japan to 300,000, and to help promote the overall internationalization of higher education (MEXT, 2022c). Behind this was the intention to secure foreign talent, make Japan more competitive, to handle the ageing population

problem, to promote mutual understanding, and foster Japanese students' global competence. As previously mentioned in the introduction, the number of international students in Japan was steadily increasing in the early 2000s, so in that sense, Japan's mission was successful to an extent. However, the rate of employment for international students has proven difficult. The domestic employment rate for international students was merely 36.9% in 2019, which is still below the government's target of 60% by 2033 (MHLW, 2021). In addition, despite COVID-19's negative impact on job seekers across the board, Disco Corporation's employment rate survey conducted with over 2800 graduating students from 2019 to 2021 revealed that Japanese students are more than twice as likely to be employed than international students (Figure 2).

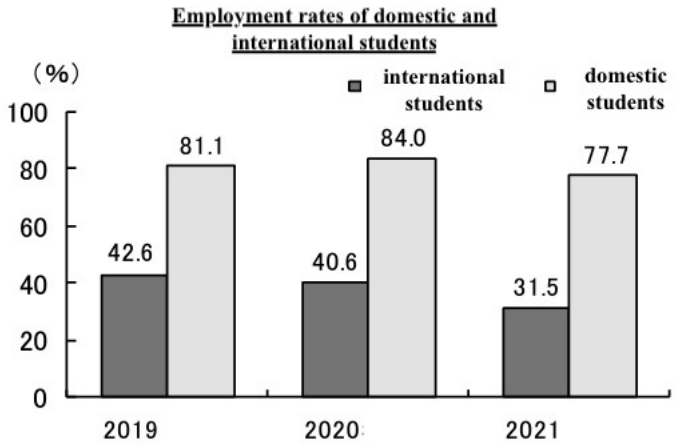


Figure 2. Employment rate comparison

Thus, based on media reports and rhetoric as well as employment statistics, MEXT is currently facing the problem of: 1) trying to attract and retain foreign talent or somehow encouraging its so-called "inward looking" students to study abroad, 2) internationalizing its universities amidst dwindling global rankings, and 3) offering more courses or degrees taught in English (which is not guaranteed to attract domestic students). The following section will thus examine and analyze MEXT's recent strategic proposal (released in late 2022) to deal with these matters.

3. Methods

Prior to revealing the findings, a brief outline of the research methods is necessary. Basically, this study involved a critical discourse analysis

of MEXT's strategic proposal taken from its study group on "The Strategic Promotion of International Student Exchange," which was released and uploaded on the Ministry of Education's official website with several other documents in late 2022. The specific data set subject to analysis was Reference File 3 ("The Current Status of International Exchange in Higher Education"). The 66-page document essentially includes data and findings regarding the current inbound/outbound study abroad trends, statistics, and issues (MEXT, 2022c). In addition, and more pertinent, the document further reveals Japan's Ministry of Education's strategies to attract more international students and secure talented and high-skilled human resources. My approach involved a critical discourse analysis based on Norman Fairclough's (2013) three-dimensional framework. Fairclough's approach to discourse analysis are as follows:

> to make visible through analysis, and to criticize, connections between properties of texts and social processes and relations (ideologies, power relations) which are generally not obvious to people who produce and interpret those texts, and whose effectiveness depends upon this opacity. (1995, p. 97)

Fairclough's three-dimensional framework for analysis involves a linguistic description of the language text, an interpretation of the relationship between (productive and interpretative) discursive processes and the text, and an explanation of the relationship between the discursive processes and social processes (1995, p.97). In this sense, I take into account the fact that the document was created by Japan's current Ministry of Education run by the conservative Liberal Democratic Party (LDP) in a context of global recession and population decline. This also means that the contents might be of especial concern to both public and private universities hoping to attract international students, as well as businesses in fields with staff shortages or future economic prospects (such as IT, medicine, and engineering). By taking into account the text's source and the intended audience, as well as the context of the transmission of the information, it is possible to conjecture the ideological intentions of the text and take a critical stance.

4. Analysis and discussions

General issues to consider

From page nine of the document, MEXT outlines its current concerns and approaches to handle the points of concern. These concerns have been summarised and analysed in the following points:

- "In order to realise the LDP's "new capitalism" concept, the government needs to invest in human resources, high-skilled workers, and foster the growth of globally competent citizens who embrace diversity" → discussion: The Liberal Democratic Party's intention is to simply stimulate economic growth by employing highly-skilled individuals with global competence.
- "There is a need to recover the loss of foreign workers/talent that Japan failed to acquire or attract due to COVID-19" → discussion: instead of looking at other factors which may have driven potential workers to other nearby countries like Singapore or Australia, the Ministry of Education is using COVID-19 as a scapegoat for pre-existing problems with attracting and retaining students and workers.
- "The government needs to promote more inbound and outbound study abroad programmes, attract diverse and innovative human resources, and create a more sustainable society → discussion: the statement is more or less a desperate call for outstanding human resources in the context of a rapidly ageing population and declining birth rate.

Strategies to attract exceptional international students — Scholarships

To follow, MEXT outlines its scholarship system (p.15) to entice more international students to study in Japan. The bottom left side of the table reveals that, to attract more foreign talent, MEXT has bolstered its scholarship funding system offering between 117,000円 per month to 145,000円 per month for undergrad to graduate level students → discussion: unless these students engage in part-time work or have an alternative and stable source of income, this is barely a livable amount. As the University of Tokyo clearly states on its Financial Aid page, the "cost of living in Tokyo is the highest in Japan, a country already known for its high cost of living. The average monthly expense (tuition fees not included) […] is JPY 137,061 for a single student" (University of Tokyo, 2023).

In addition, in the upper left part of the table where the "aims" of the scholarships are listed, it outlines the following main objectives: "to attract excellent or exceptional foreign talent to Japanese universities, to strengthen Japan's international relations, and to improve Japan's

global research-related rankings and performance → discussion and underlying issue: Japan is struggling to compete in terms of quality of research output compared to the US and China, and it is in a haste to change that by giving preference to excellent researchers instead of regular students. However, with universities abroad offering far more generous scholarships, it is going to be a challenge.

Furthermore, the table on page 17 indicates that more funds and scholarships are allocated to students in higher education rather than students enrolled in vocational schools, technical colleges, or Japanese language schools. To be precise, there were 4581 scholarships available for university students and only 730 scholarships for students at vocational schools, technical colleges, or Japanese language schools → discussion: the rhetoric of acquiring mainly excellent or exceptional students is repeated here and there is also emphasis on mainly helping students who might have financial difficulties. The problem with this, however, is that there are exceptional researchers out there who Japan is missing out on because they place less emphasis on supporting students who might be a bit better off.

Strategies to attract exceptional international students – Bolstering employment support

Taking into consideration the aforementioned issue of employment after graduation for international students, on page 18, MEXT reveals its plans to implement employment support programmes for graduates at over 50 higher education institutions by 2026, and additionally aims to reach a 50% graduate employment rate by 2025. The same page also includes a bar chart of international students' employment rates (Figure 3, left) and a diagram which suggests that a "high quality education programme" comprises internships, Japanese language education, and career guidance → discussion: As previously stated, that the number of students who secured jobs started declining in 2018, thus reducing it to a COVID-19 issue is far too simplistic and disregards other diverse factors contributing to the problem (such as cultural and language barriers or systemic issues). While reasonable to an extent, the diagram that assumes that internships, Japanese language education, and career guidance equate to a high-quality education programme is also simplistic. What is crucial to investigate is why international students are not being hired, what is discouraging students from getting a job in Japan, and the problems with Japanese companies' business styles and work ethics.

Figure 3. Employment rates of international students and factors contributing to a high-quality education programme

Strategies to attract exceptional international students – Online courses

Another one of ministry's plans in the document is the "Japan Virtual Campus" concept (p.22). The aim is to simply boost the number of online courses for inbound and outbound students in a post-pandemic context. One of the goals is to promote the strengths and appealing points of Japanese universities. Other goals include increasing the amount of hybrid classes and on-demand classes, and increasing classes taught in English and Japanese classes which also promote "Cool Japan" ideology → discussion: While online courses are cost-efficient, practical for institutions and students with financial or mobility difficulties, and some students might even feel more motivated (Almaleki, 2021), the lack of interaction can have a detrimental effect on other learners (Esra & Sevilen, 2021). Essentially, the bottom line is that online learning systems are cost efficient for education institutions in Japan, and content that promotes "Cool Japan" ideology and the supposed strengths of Japanese universities is arguably soft power marketing masked as education.

Strategies to attract exceptional international students – Increasing partnerships

The ministry's following proposition is to increase and strengthen Japan's programmes and partnerships with universities overseas with a 1-billion-yen investment (marked in the darker shaded areas in Figure 4). However, there is a distinct emphasis on partnerships with American universities → discussion: aside from providing more English language education programmes for outbound students, perhaps a reason partnering up with more American universities is related to the fact that they have traditionally dominated the global university rankings. Thus, attracting elite or outstanding achievers or researchers from these universities is obviously an ideal situation for Japanese universities and invested businesses.

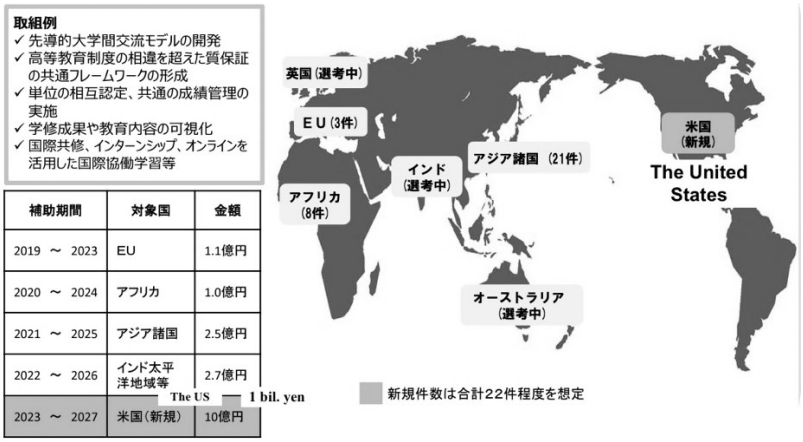
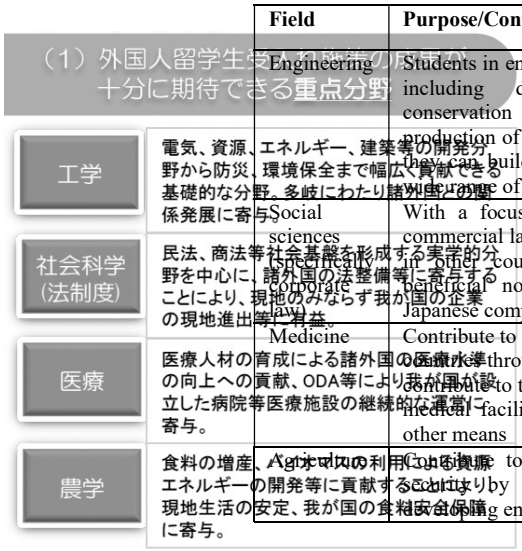


Figure 4. Countries to increase partnerships with

Strategies to attract exceptional international students – Focusing on skills shortage fields

According to the international student demographics in Japan based on students' majors (p.36), while Germany, Russia and the US attract engineering students, Japan is somehow failing to.
Rather, most of the international students in Japan are enrolled in humanities or business and management courses. There are also few students in math and computer science courses. These are ideally the students Japan is trying to attract and benefit from to remain globally competitive (rather than students in the humanities). The following is MEXT's list of the kind of students Japan expects to benefit from. As evidenced in Figure 5 (p.61 of the document), engineering, corporate law, medicine, and agriculture are the areas of expertise Japan desires, yet, as noted, most students tend to enroll in humanities courses → discussion: The aforementioned fields of employment which are in demand are by no means specific to Japan. The shortage of medical staff in a number of countries was exacerbated by the COVID-19 pandemic, but the World Health Organization also estimates that there will nevertheless be a shortfall of 10 million healthcare workers by 2030 (WHO, 2023). Aware of its ageing population, Japan is in desperate need of aged-care workers as well as general practitioners. In addition, food security is becoming a serious issue due to Japan's low its self-sufficiency rate of only 38%, which has been described as "the lowest among other major countries" (Lewis & Inagaki, 2022). Considering this context and the emphasis on "contributing to the stability of life in Japan," one could argue that the underlying motivation is for Japan to protect its own people by luring foreign professionals. In addition, given that IT professionals and engineers are

remunerated far better overseas, Japan is also seeing its own citizens migrate elsewhere for better opportunities and a comfortable work-life balance (Maeda, 2023). Trying to retain workers in these fields and persuade talented international students in these fields to study and work in Japan (rather than in countries offering generous salary packages and conditions) is going to be a challenge. Essentially, the expectations of students majoring in these fields are to primarily prevent the country (Japan) from going hungry, sick (resulting in staff shortages), and becoming less competitive (due to a lack of innovation and overseas business expansion). In short, the rhetoric is "What can we get from them?" rather than "What can we offer?" and this is arguably neither a sustainable nor ideal approach.



Field	Purpose/Contribution
Engineering	Students in engineering can contribute in a number of ways, including disaster prevention and environmental conservation activities through developments in the production of electricity, resources, and energy. In addition, they can build partnerships and connections overseas in a wide range of fields.
Social sciences (especially in corporate law)	With a focus on practical fields such as civil law and commercial law, by contributing to the development of laws in other countries, students from these fields will be beneficial not only for local companies, but also for Japanese companies hoping to expand overseas.
Medicine	Contribute to the improvement of medical standards in other countries through the development of medical professionals; contribute to the continuous operation of hospitals and other medical facilities established by Japan through ODA and other means
Agriculture	Contribute to the stability of life in Japan and its food security by increasing domestic food production and developing energy resources through the use of biomass.

Figure 5. Students from fields Japan expects to benefit from

Strategies to attract exceptional international students – Scholarships for students in especially demanded fields

On page 62 of the document, the ministry further outlines how it will provide potential scholarships and programmes for international students in the four major fields mentioned above.

The following is a summary of the intentions and plans:

<u>Prioritised fields of study and plans</u>

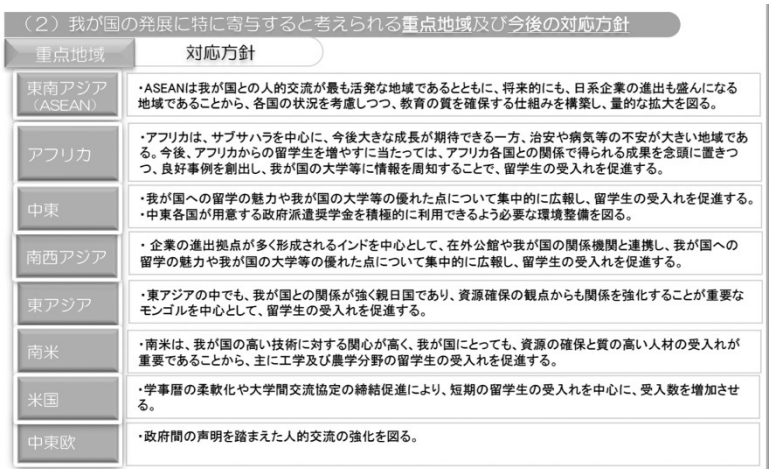
- Bolster MEXT's Scholarship Programme for International Students (University admission based on the recommendation system)

- By using the "Special Programme for Preferential Placement of MEXT Scholarship Students" (for graduate school), students can apply for (and be accepted in) programmes in the fields of engineering, social sciences, medicine, and agricultural science

→ Discussion: Evidently, MEXT is focusing on graduate students and attracting more talented researchers or human resources rather than the average undergraduate student in humanities or Japanese language courses. Because Japan is offering greater or more generous opportunities for exceptional graduate-level students, ordinary undergraduate students are being overlooked as valuable human resources. The problem with this is that these students will seek opportunities elsewhere, especially countries that offer higher or competitive wages. Also, it is highly likely that exceptionally talented graduate students would first search for medicine, law or engineering postgraduate degrees in renowned, prestigious, or top-ranked universities in Europe or North America which offer courses in English. The difficult job application process, emphasis on strong work ethics and company loyalty, poor work-life balance, and stagnant and low salaries make seeking employment in Japan undesirable. Talented human resources will go where they are treated better and paid better and that is the harsh reality Japan now faces.

Strategies to attract exceptional international students – Region-specific recruitment

While the above-mentioned major fields are priorities for MEXT, what students from specific regions can offer Japan are also emphasized in page 61 of the proposal. Figure 6 outlines MEXT's list of "Prioritized Regions/Countries" and how students from said regions can contribute to Japan's prosperity. Basic translations of the content in Figure 6 and discussions can be found below.



（2）我が国の発展に特に寄与すると考えられる重点地域及び今後の対応方針

重点地域	対応方針
東南アジア（ASEAN）	・ASEANは我が国との人的交流が最も活発な地域であるとともに、将来的にも、日系企業の進出も盛んになる地域であることから、各国の状況を考慮しつつ、教育の質を確保する仕組みを構築し、量的な拡大を図る。
アフリカ	・アフリカは、サブサハラを中心に、今後大きな成長が期待できる一方、治安や病気等の不安が大きい地域である。今後、アフリカからの留学生を増やすに当たっては、アフリカ各国との関係で得られる成果を念頭に置きつつ、良好事例を創出し、我が国の大学等に情報を周知することで、留学生の受入れを促進する。
中東	・我が国への留学の魅力や我が国の大学等の優れた点について集中的に広報し、留学生の受入れを促進する。 ・中東各国が用意する政府派遣奨学金を積極的に利用できるよう必要な環境整備を図る。
南西アジア	・企業の進出拠点が多く形成されるインドを中心として、在外公館や我が国の関係機関と連携し、我が国への留学の魅力や我が国の大学等の優れた点について集中的に広報し、留学生の受入れを促進する。
東アジア	・東アジアの中でも、我が国との関係が強く親日国であり、資源確保の観点からも関係を強化することが重要なモンゴルを中心として、留学生の受入れを促進する。
南米	・南米は、我が国の高い技術に対する関心が高く、我が国にとっても、資源の確保と質の高い人材の受入れが重要であることから、主に工学及び農学分野の留学生の受入れを促進する。
米国	・学事暦の柔軟化や大学間交流協定の締結促進により、短期の留学生の受入れを中心に、受入数を増加させる。
中東欧	・政府間の声明を踏まえた人的交流の強化を図る。

Figure 6. Prioritized Regions/Countries which can particularly contribute to the development of Japan and future response policies

・Southeast Asia (ASEAN): The ASEAN region is where exchanges with Japan are most active, and in the future, Japanese companies will also actively expand into these regions so while taking into account each country's situation, we will create a system to ensure a decent quality of education and aim for quantitative growth → discussion: With the rhetoric and emphasis on 'quantitative' economic growth, it seems that Japan is looking after its own interests of economic expansion in the ASEAN region rather than carefully considering what students from this region might want to do after studying in Japan.

・Africa, especially Sub-Saharan Africa, is a region where great growth can be expected in the future, but there are great concerns about security and disease. In the future, when increasing the number of international students from Africa and keeping in mind the results obtained from relationships with African countries, we will promote the acceptance of international students by creating good practices and disseminating information to Japanese universities, etc. → discussion: Once again, the discourse regarding economic growth is emphasized, as well as potentially xenophobic concerns about 'security and disease'. The overall impression is that Japan can significantly benefit from Africa/students from Africa, but only when security or health-related inconveniences are addressed or when it suits Japan's needs.

・We will promote the acceptance of international students by intensively publicizing the attractiveness of studying in Japan and the excellent points of Japanese universities in the Middle East. We will create an environment to actively use government-sponsored

scholarships provided by Middle Eastern countries → discussion: Aware of the Middle East's growing economic prowess and prosperity, MEXT understands that many elite students from this region seek 'excellence,' and that usually equates to getting a degree or MBA at a prestigious or top-class university in the Anglosphere. For this reason, Japan's Ministry of Education assumes that perhaps a massive marketing campaign in the Middle East can compensate for what it might lack in excellent education.

・In Southwest Asia, East Asia, and India, where many companies have expanded their bases, we will intensively publicize the attractiveness of studying in Japan and the advantages of Japanese universities, etc. By cooperating with diplomatic missions abroad and relevant Japanese organizations, we can promote the acceptance of international students → discussion: similar to its approach to the ASEAN region, the emphasis on economic growth and overseas expansion is reinforced here. Instead of considering the pedagogic or educational needs of students from this region, neoliberal objectives and values dominate the discourse.

・With the intention of strengthening relations in order to secure resources, among all East Asian countries, we will especially promote the acceptance of foreign students from Mongolia, given its pro-Japan attitudes and strong ties with Japan → discussion: Given its lack of natural resources and heavy dependence on imports, naturally and rather conveniently, forming ties with Asian nations with an abundance of natural resources instead of investing in renewable energy is optimal for the Liberal Democratic Party. In addition, rather than trying to rebuild relationships with neighboring countries that Japan exploited during the war, resorting to allies or countries with 'pro Japan' attitudes implies convenience is valued over diplomacy. It also implies that students or individuals with 'pro Japan' attitudes are preferred or prioritized, which is arguably quite a narrow-minded and unsustainable way to attract students and possibly human resources.

・South America has a high level of interest in Japan's advanced technology, and because it is important for Japan to secure resources and accept high-quality human resources, we will promote the acceptance of international students mainly in the fields of engineering and agriculture → discussion: With its historical and bilateral ties with Brazil in terms of immigration, students and laborers from South America are of significant value to Japan. For the most part, Brazilians seeking opportunities in Japan have come as technical trainees and

found law-wage employment in the automobile manufacturing industry as factory workers (Yamazaki & Bugarin, 2022). With the emphasis on securing 'resources' and 'human resources,' as well as the fields of 'engineering' and 'agriculture,' one can infer that MEXT's underlying intention is to secure valuable natural resources and indispensable human labour in work environments considered undesirable for Japanese nationals (such as farm or factory work).

・We will accept more students (but mainly short-term exchange students) from the US by making the academic calendar more flexible and promoting further inter-university exchange agreement contracts → discussion: Perhaps realizing that there are greater employment and entrepreneur opportunities for students in the US (as the largest economy in the world), the purpose of mainly attracting short-term exchange students could be considered an effort to create a façade of internationalizing domestic universities (by simply increasing the number of English-speaking students instead of providing more degrees or courses offered in English).

・We will work to strengthen exchanges based on the statements made between the governments of Central and Eastern Europe → discussion: The brevity of this proposal and the lack of mention of Northern and Western European countries assumes that students from these regions are wealthy enough to support their own studies. It could also imply that such students are neither valuable to Japan nor worth marketing to (considering the high living standards and work-life-balance that such countries usually offer). Unfortunately, by limiting opportunities for students from progressive-thinking countries, Japan limits the opportunities for the exchange of diverse values and attitudes and thereby remains isolated in a bubble of neoliberal conservatism.

5. Conclusion

In this article, the rhetoric in Japan's Ministry of Education's (MEXT) most recent and ambitious plan to attract outstanding research students (and in turn, highly-skilled workers) to Japan was analyzed and discussed. The basic media discourse analysis of news articles concerning Japanese higher education spanning from a pre- to post-pandemic context revealed that media reports tended to focus on: 1) Japan's decline in global competitiveness, 2) Japan's problems with attracting international students, and 3) Japan's problem with securing and retaining human resources. While bleak or negative in tone, this is the backdrop of the current situation in Japan and the reason why the Ministry of Education is heavily investing in attracting international

students and possible human resources. By means of critical discourse analysis, a further analysis of MEXT's strategic proposal to attract more international students was also conducted. The findings and discussions revealed that the proposal's neoliberal bias framed international students as "investments" or mere sources of labour rather than knowledge-seeking individuals. By primarily focusing on scholarships for exceptional students from specific regions (where Japan's overseas expansion is expected) and in specific fields (where labor is in demand), Japan is creating obstacles for ordinarily talented students beyond these regions or majoring in different subjects. Although Japan is trying to raise the bar by placing greater emphasis on excellent scholars (who would probably study at highly-ranked and renowned universities elsewhere), it is digging its own hole in a context of population decline and a lingering economic recession. As noted earlier, the findings and discussions from this paper may give institutions in the education and employment sectors an opportunity to reassess their current support systems and programmes for lucrative foreign talent. Thus, here are some points which need to be considered or addressed: 1) rather than focusing on exceptional researchers or students, higher education institutions in Japan need to attract a diverse range of students in various fields and majors to secure human resources and encourage innovation; 2) the Ministry of Education needs to extend or provide more generous scholarships to students who deserve them; and 3) universities and businesses need to provide career pathways and encourage a complete uphaul of the strict and complicated recruitment procedures in Japan to ensure graduates stay.

Lastly, aside from simply offering scholarships and internationalizing its universities with a handful of international students and token English-speaking adjunct lecturers, Japan needs to internationalize its communities and companies because if this fails to change, graduates will seek employment in countries that boast more cultural diversity, tolerance, and lifestyles that value a comfortable work-life balance. With its rapidly ageing and dwindling population paired with its deteriorating competitiveness and economic robustness, observing Japan's plans and policies in action may serve as a lesson or model for countries facing similar problems in the near future.

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THE DIDACTIC MENTOR'S KIT. THE EFFICIENCY OF THE MENTORING ACTIVITY

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Abstract: *In a mentoring program, two characters are necessarily involved: the mentor and the mentee. In order to achieve an effective, authentic mentoring process, one must start from the intersection of the answers to two questions: What do I expect from the mentor/mentee and What do I bring to the mentoring process? In addition to personality and professional traits, the mentor teacher has to prepare and use a series of working tools, a mentor's kit, which in a general form we will present in this work paper and which need to be adapted according to the needs of the mentee and the school institution. The tools in the mentor's kit were presented and offered for use to the 293 teachers, participants of the Prof I and II course, in two modules. In short research survey we introduce present the views of the mentors who used them.*

Keywords: *mentor; mentee; mentor toolkit; tools.*

Introduction

The topicality of the mentoring issue and the perspectives that we see towards this way of developing teachers are the reasons why we decided to write this work paper. In addition to the resources related to the personality structure and professional training of the mentor, for an effective mentoring process, tools are needed, which we present as a mentor's toolkit. They are the result of improving, refining, adapting to new educational contexts some of the tools used in the mentoring process over a long period of time.

In the dictionaries available to us, we will find a relatively wide range of semantics associated with the term - mentor: spiritual leader, guide, tutor, preceptor, educator.

Bilingual dictionaries - French/Romanian, German/Romanian, Italian/Romanian, English/Romanian - do not add other meanings to the word, at most other formulations subsumable to the same semantic

range, such as: enlightened counsellor, advisor, instructor, teacher. With references to some cultures outside Europe, terms such as guru, sensei, but also the Romanian antrenor or English coach can be added.
Some dictionaries refer to the origin of the term, Mentor being the name of a literary character, friend of Ulysses, to whom he entrusted, during his absence by going to war, the task of tutor of his son Telemac. As Ulysses' protector, the goddess Minerva, also known as Palla Thena, goddess of wisdom, lent Mentor the guise of Ulysses, the father, to instruct Telemac.
With the same meaning, of teacher and enlightener, the word 'mentor' is used by the School of Socrates and Plato and the Aristotelian Academy.
Mentor means: "in a broad sense, a person who helps someone develop through learning; in a narrow sense, a professional who works with a person, group or organisation for personal or organisational development".
According to the Encyclopedic Dictionary. Education Sciences for young people, the mentor is, "one who will encourage, advise and support them in their development."
The mentor will provide practical assistance to ensure that young people have the opportunity to achieve their goals in the workplace.
Factors to consider when linking the two actors mentor and mentee are the willingness of the mentor to take on this role and the compatibility of the mentor and mentee personalities.
An effective mentor can be the person who: shows a desire to help, has a high dose of altruism, has a positive professional experience, has a good reputation, shows availability of time and energy to devote to the mentee, shows openness to new things, continuous availability for learning, has the ability to see, to feel the potential benefits of the mentoring process (Popa, C. 2009).
The mentee is the person who is willing to: practice his/her skills, be receptive to new ways of learning and trying out new ideas, accept and act on the feedback received, show a willingness to apply what he/she has learned in the workplace, be persistent in achieving goals and achieving the right results, be willing to ask for support, be willing to perform the assigned tasks on a regular basis, contribute to his/her own development and to the mentoring process (Popa, C. 2009).
The professional and personal motives of the mentor, following an effective process, can be found in the fact that:
he/she carries out a wider activity with the help of the mentee, acquires a crucial subordinate, has an opportunity for self-development, has a new way of enriching knowledge, experience, being each time a sharer in the achievements successes and failures of the mentee, is rewarded

by the development of a new professional, invests in the new disciple, pays off social debts, increases motivation, discovers new perspectives, finds experiences that can increase self-esteem and an opportunity to positively influence future generations, improves communication, has someone to tell their professional stories to (Popa, C. 2009).
In Romania mentoring is an occupation, recognised under COR code 235902, which is becoming increasingly necessary for authentic teacher training.
The project PROFESSIONALIZING TEACHING CAREERS - PROF, carried out at national level, with several components, hopes to achieve a training of mentor teachers and the legal and methodological support that will lead to the development of an authentic mentoring.
In addition to personality and professional traits, the mentor teacher has to prepare and use a series of working tools, a mentor's kit, which in a general form we will present in this work paper and which need to be adapted according to the needs of the mentee and the school institution

Mentor's kit

In order to carry out the teaching mentoring activity in a coherent and systematic process, it is necessary to design the mentoring activity and to create a kit, which includes the basic tools, starting from a comprehensive analysis of development needs, to activity observation sheets, observation sheets focused on various areas of teaching activity, to professional dialogue sheets, progress evaluation sheets, final evaluation sheets of the mentoring activity. The design of the mentoring activity involves a sequence of steps and activities, starting from the needs analysis.
The needs analysis of the mentee, whether we are talking about mentoring for students (training) or for junior teachers (development), can be carried out using several types of activities: direct observation of the mentee's work, interviews with the mentee and several tools: questionnaire, needs analysis sheet. Each of these activities and tools provides a certain type of useful information in order to make a diagnosis, a clearer picture of the development needs of the learner.
The Needs Analysis Sheet is useful in establishing training needs at the beginning and during a mentoring phase. The mentee will establish their strengths and areas for improvement and then set their personal menu and personal targets, which they will pursue during the mentoring activity. Professional development needs will be prioritised based on the Professional Standards, specific to their level of work.

The mentoring needs analysis will be carried out by the mentee, with the support of the mentor, in the first mentoring activities and may be reformulated during the mentoring process.
Depending on the development needs identified by the mentor or mentee, depending on the diagnosis carried out at school level, the areas/units of competence of the Occupational Standards or any of the areas, specific to the teaching activity, may be addressed. These may include: Instructional design, Classroom management, Conflict management, Instructional communication, Instructional assessment, ICT, European projects, Teaching-learning methods, Methodical activity, Nonformal activity.
The following reflective questions can be used to support the learners in carrying out the needs analysis:
What are the areas in the Professional Standards in which you feel you are well prepared?
Which areas do you feel you need to improve?
What are your professional development goals?
Which of the professional targets set have been achieved?
What will be your next professional target? What will be the work to be carried out?
Through dialogue, based on the targets set in the needs analysis, the mentor teacher together with the mentee will establish an Activity Plan. The activities, tools, resources needed, time, place and way of implementation will be mentioned.
The following reflective questions can be used to support the mentee in developing the mentoring plan:
What are the activities needed to achieve the proposed targets?
What are the necessary tools?
The mentoring plan may include some specific activities:

1. Observation of teaching activities
2. Support of teaching activities by the mentee
3. Completion of the professional dialogue sheet
4. Completion of the Professional Progress Sheet
5. Completion of the Final Evaluation Report

Observation of teaching activities, can be:
Observations in the mentor's class made by the mentee;
Observations in the mentee's class by the mentor;
Observations focused on specific teaching aspects;
Observations of extra-curricular activities, parent meetings, methodological activities, pedagogical circles.
During each observed activity, in the mentor's classroom, the mentee will complete a sheet, Appendix 1. The observation sheet is designed in such a way that the mentee's notes can become a reference for their

own design. At the end of the observation, the mentee can clarify possible concerns or find other ways of intervening in the educational situations observed. Throughout the mentoring activity, reflection and self-reflection is encouraged, providing reflective questions to help the mentee identify the degree of success and alternatives that could improve the teaching performance.

For the observation of extra-curricular activities, methodical activities, meetings with parents, the mentee will use as tools specific journals for the activities. Annex 2

After the period of observation of the mentor's work, the demonstration activities are followed by the mentees, initially in partnership with the mentor for immediate and punctual support and then in partnership with a colleague, if this is possible.

This stage involves:

Supporting activities in partnership, mentor - mentee;

Supporting activities in partnership between two mentees;

Supporting activities by the mentee;

Supporting activities focused on specific teaching aspects;

Supporting extra-curricular activities, meetings with parents, methodological activities, pedagogical circles.

For each learning activity the learner designs the activity, Appendix 3.

At the end of each activity the mentor and mentee will use the Activity Analysis, Self-Assessment/Descriptive Assessment and Measurement Sheet to record the results of the mentee's self-reflection and the mentor's observations, Appendix 4.

The recommendations will take into account areas of low scores. These areas, for example: use of teaching aids, classroom management, organisation of interactive learning, differentiated learning, become topics/themes for professional dialogue.

Professional dialogues can be recorded on the Professional Dialogue Record Sheet, Annex 5. This can be used by the mentor to analyse and reflect on different experiences: supporting activities, producing products (activity projects, learning sheets, assessment tests, learning support materials), individual study, personal development plan, reviewing development needs.

At the end of the professional dialogue, conclusions will be mentioned, targeting progress and areas for improvement, for the next steps and activities. The mentor makes recommendations on bibliography, self-study, ways of documentation, etc.

The mentor can also support teaching activities focused on observing these practices and then the mentee will support activities in which they demonstrate the targeted behaviour. In these circumstances,

Activity Observation Sheets will be used, focusing on the issues identified (Appendix 6).
At the end of the mentoring process, an Evaluation Sheet will be used, in which the mentee's activity is self-evaluated/evaluated in descriptive terms (Annex 7).
From the mentee's perspective the mentoring process ends with a reflective journal (Annex 8), in which he/she analyses and records the impact it has had on his/her own development and the ways of intervention, should the mentoring continue, in a new phase.
Each of the attached instruments will have a section with identification data, depending on the specifics of the instrument and the signatures of the two actors.
Each activity in the mentoring process has an integrated reflexive exercise, giving the mentee the opportunity to identify effective practices that have met the mentor's expectations and aspects that need improvement. The reflective exercises are an opportunity to provide feedback for subsequent activities.

Research presentation. Results obtained

The tools in the mentor's toolkit were presented and offered for use to the 293 teachers participating in the Prof I and II course, in the modules Designing Mentoring Activity and Managing Teaching Practice Activity. Of the participating teachers, 35, 12%, responded to a questionnaire expressing their opinion on the usefulness, advantages and issues that may create problems in using these tools.
During the 10 series, 13 hours each, two purposes were permanently pursued: to go through the contents and the training of specific competences related to the modules and to present and analyse the tools in order to convince teachers to use them in the mentoring activity.
85% of respondents rated the quality and coherence of the tools presented very highly and 13% to some extent.
100% of respondents rated the consistency of the tools in the mentor toolkit very highly.
92% of respondents used the tools presented in the mentoring activity.
85% of respondents asked mentees for their opinion on the usefulness of the tools used.
Of these 100% appreciated the usefulness of the tools in the mentor's kit.
Participating teachers found the idea of teaching in partnership with mentees new and interesting.
Among the aspects that pose some problems in using these tools were mentioned: their complexity, which requires a good theoretical psycho-

pedagogical training to understand the terms and the existing connections, a lot of time to use them, sustained effort from mentors and mentees for demanding reflective exercises.

Conclusions

The tools proposed in this paper are the fruit of twenty years of mentoring. The tools have been designed and continually improved according to the specifics of the institution, the discipline and the mentee.

Starting from the needs analysis, the effective mentor is the one who, through his actions, is moulded to the mentee's needs, with the permanent objective of supporting him in his professional development.

Each activity in the mentoring process, as a mentor, practice coordinator or mentor training, ended with satisfaction questionnaires and measurement of the impact, usefulness, coherence and problems of these tools.

In each setting, satisfaction was provided by the usefulness of the tools received.

Working with these tools is not easy, neither for mentors nor mentees. It requires time, commitment, concentration, reflection but the results lead to an authentic mentoring process.

The way mentoring is now organised requires efforts that only passionate mentors and mentees are willing to make.

We hope that the restructuring of the mentoring process, the repositioning of the mentoring institution on new foundations, will provide the opportunity to use the tools to mainstream the conduct of authentic mentoring.

Annex 1.

Specific skills (Explicitly record the competencies, as they appear in the syllabus)	Operational objectives
S.s....	O1 O2. …
S. s...	

Table 1. Activity observation sheet

Content details	Specific skills	Teacher's activity	Learning activity	Resources (Methods Teaching aids Ways of organising learning)	Ways of Assessment/ Assessment methods continuous

Annex 2

Reflective questions	Examples
What news have you learned?	
What were your most successful experiences during the activity?	
What do you think made it successful?	
What did you participate in the activity with?	
What did you get out of the activity that you carried out?	
What changes would you make to improve the quality of your participation? Refer strictly to yourself.	
What are the new things you are taking forward in your teaching?	
What would you change if you resumed participation in this type of activity?	
Questions you would like to clarify with your mentor	

Table 2. Reflective diary for extra-curricular activity/ Reflective journal for methodical work/teaching circle

Note:
You can fill in any aspect that you think would enhance the quality of self-reflection.

Annex 3.

Specific skills (Explicitly record the competencies, as they appear in the syllabus)	Operational objectives
S.s....	O1 O2. …
S. s...	

Content details	Specific skills	Teacher's activity	Learning activity	Resources (Methods Teaching aids Ways of organizing learning)	Ways of Assessment/ Assessment methods continuous

Table 3. Activity project

Note: Attach to the activity project Appendices: worksheets, clippings from the collections, application notebooks, the digital manuals that you use as support in the activities.

Annex 4.

Domain and aspects assessed	Self-reflection of the learner*	Appraisals/ Mentor's recommendations	Maximum score	Self-assessment	Assessment
Activity design			24 p		
1. Correlation - Content Details. Skills. Learning activities. Resources. Assessment			4 p		
2. Logical sequence of teaching sequences			4 p		
3. Creativity in lesson design			4 p		
4.Intra/interdisciplinary correlations			4 p		
5. Appropriate selection of methods, procedures, ways of organising learning			4 p		
6. Selection of resources. Mandatory requirement - multimedia resources			4 p		
THE CONDUCT OF TEACHING ACTIVITY			44p		
1. Following the syllabus			4 p		
2. Making knowledge accessible, essential and systematic			4 p		
3. Involving all students in learning			4 p		
4.Efficient use of learning resources.			4 p		
5.Differentiating learning			4 p		
6.Providing the necessary support to each pupil			4 p		
7.Scientific accuracy. Correctness of expression (written and oral)			4 p		
8.Clear formulation of tasks, explanations			4 p		
9.Ensuring optimal time and pace			4 p		
10.Carrying out continuous assessment and providing feedback			4 p		
11. Developing students' self-assessment skill			4 p		
CLASSROOM MANAGEMENT			20 p		
1. Handling difficult situations arising in class			4 p		
2. Establishing and maintaining a stimulating atmosphere			4 p		
3. Maintaining discipline			4 p		
4. Valuing positive attitude towards learning, group work, peer support			4 p		
5.Motivating pupils for the activity			4 p		
SELF-ASSESSMENT OF WORK			12 p		
1. Ability to objectively self-evaluate teaching performance			4 p		
2. Ability to support the approach taken psycho-pedagogically			4 p		
3. Ability to respond to observers' questions			4 p		
Total marks			100 p		

Reflection on teaching principles	
P1. Intuition principle	
P.2 The principle of conscious and active participation of all students	
P3. Principle of systematization and continuity	
P4. Principle of linking theory to practice	
P5. Principle of respect for age and individual particularities	

Table 4. Evaluation sheet of teaching activity

* Examples. Concrete ways of implementation. Teaching practices that meet each criterion assessed
Overall assessment by the mentor:

Annex 5

Subject of dialogue	Positive aspects (progress since previous dialogue)		Aspects that can be improved		Appreciations/ Recommendations*
	Self-assessment	Evaluation	Self-assessment	Evaluation	

Table 5. Professional dialogue sheet

Date and place of next dialogue:
*Mentor's feedback, recommendations on possible ways forward:

Reflective questions
1. What were your most successful experiences during the activity?
2. What do you think made it successful?
3. What were the least successful experiences during the activity?
4. What do you consider to have caused the failure?
5. What met your expectations?
6. Which teaching sequences/experiences did not meet your expectations?
7. What would you replace them with if you were to resume the activity? What changes would you make?
8. What was the impact of the activity on students?
9. What would you like to clarify with the mentor?

Annex 6.

Nr. crt.	Evaluation criteria	Self-reflective exercise. Comments. Alternative methods	Comments. Alternative methods / mentor's suggestions
1.	Matching of teaching material and target competence		
2.	The material met the requirements methodological (suggestive, attractive, diversified, differentiated)		
3.	The material was used in front of the teacher / in groups / individually.		
4.	Adaptation to the age specificities of the pupils		
5.	Multimedia materials were used		
6	Specific teaching aids for multimedia learning were used		

Table 6. Activity observation sheet - Use of teaching aids

Reflective questions
What about the way you used the teaching aids satisfied you?
What do you think ensured understanding and learning?
What about the use of teaching aids did you find unsatisfactory? Why?
If you were to repeat the activity, what would you change?
What alternatives do you think you have to improve the effectiveness of the use of teaching aids?
What solutions do you see to prepare for the next activities, from a teaching aid perspective?

Evaluation criteria	Self-reflective exercise. Comments. Alternative methods	Comments. Alternative methods / mentor's suggestions
Clarity of instructions		
Teacher checked whether students understood the instructions		
Students were cooperative		
Teacher maintained eye contact with class		
The teacher expressed him/herself in an approachable manner, clear, coherent and nuanced.		
Teacher maintained control of the class throughout the lesson		
Teacher encouraged participation all students		
Teacher organized activities individual, group/team		

Table 7. Focused Observation Sheet - Classroom Management

Reflective questions

1. What was it about classroom management that pleased you? Why?
2. What about classroom management did you find unsatisfactory? Why?
3. What would you change if you were to return?
4. What alternatives do you consider to improve performance?
5. What solutions do you see to prepare you to remedy problems? Progress and areas for improvement, in interactive learning.

Annex 7

COMPETENCES. ASSESSMENT INDICATORS	Grading awarded		Mentor's recommendations
	Self-	Evaluation	

	evaluation		
I.Cognitive competence			
1. Content knowledge of the subjects taught			
2.Correct writing and neat expression			
II.Design competence			
1. Compliance with the programme			
2. Carrying out the teaching design:			
a) Correlation - Details of content. Skills. Learning activities. Resources. ASSESSMENT			
b) Creativity in designing the lesson			
c) Ensuring the applicability of the content			
d) Intra and interdisciplinary correlations, integrated approach			
e) Appropriate selection of teaching-learning methods (focusing on student activity)			
f) Selection of resources. Mandatory requirement multimedia resources			
g) Combining different forms of activity (frontal, group, individual)			
h) Designing differentiated learning tasks			
i) Adequate selection of continuous assessment modalities			
III.Competence of action			

1.Preparing/maintaining the necessary conditions for the lesson:			
a) Ensuring the means of education			
b) Organization of the group of students			
2.Using motivational strategies			
a) Capturing attention			
b) Maintaining interest in knowledge			
c) Satisfying students' cognitive needs			
d) Attractive approach to the contents and the form of presentation			
e) The ability to effectively use the forms of motivation			
3.Use of teaching-learning-evaluation strategies			
a) Adequate use of teaching-learning methods (focusing on student activation)			
b) Ensuring the applicability of the content			
c) Organizing the class and distributing tasks ensuring the participation and support given to all students;			
d) Capitalizing on the formative value of group activities			
e) Ensuring differentiation in learning			
f) Effective use of educational means in the activity (including multimedia)			
g) Judicious use of training time			
h) Use of assessment as a			

source and opportunity for learning			
i) The use of the evaluation results in the self-regulation of the didactic act			
IV. Communication and relational competence			
1. Semantic communication:			
a) Communication and relationship with the mentor teacher			
b) Ensuring the receptivity of the message (intelligibility, fluency, rhythm, degree of accessibility);			
2. Affective communication			
a) The ability to apply to the student's situation			
b) Identifying problems and solving them constructively			
V. Personal skills/qualities			
1) enthusiasm			
2) affective availability			
3) confidence in students' abilities			
4) consistency			
5) assuming responsibility for the training of students			
6) objectivity			
7) affective balance			
8) flexibility of behavior			
9) moral dress			
10) punctuality in designing			
11) responsiveness to the mentor teacher's			

suggestions			
12) punctuality in the didactic activity			
VI. Self-assessment capacity			
1. The ability to make decisions, during the activity, related to the teaching-learning-evaluation process for the purpose of self-regulation			
2. The capacity for objective self-evaluation of teaching performance			
3. The ability to psycho-pedagogically support the work done			
4. The ability to answer the observers' questions			

Table 8. Final evaluation sheet of the follower's activity

Note:
A qualification is given for each indicator.
Recommendations from the mentor make explicit reference to competencies and assessment indicators.

Annex 8

Reflective questions	Exemplification
1. What were the most successful experiences during the mentoring activity?	
2. What do you think has determined the success?	
3. What were the least successful experiences during the mentoring activity?	
4. What do you think caused the failure?	
5. What met your expectations?	
6. What did not meet your expectations?	
Conclusion. What changes would you make in your own work in the new mentoring phase/if the mentoring were to resume?	

Table 9. Practice journal

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ENHANCING ENTREPRENEURSHIP OPPORTUNITIES THROUGH CHEMISTRY EDUCATION: IMPLICATION FOR NIGERIA YOUTH EMPOWERMENT IN THE 21st CENTURY

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Abstract: *The study investigated enhancing entrepreneurship opportunities through chemistry education: Implication for Nigeria youth empowerment in 21st century. Three research questions with their corresponding null hypotheses guided the study. A quasi-experimental, non-randomized control group design was adopted in three intact groups. population of this study was 954 SS 3 chemistry students in Odeda Local Government Area. A sample of 142 chemistry students was drawn using a purposive and simple random sampling techniques from three (3) out of 18 public schools in the LGA. Three intact classes were randomly assigned experimental groups (two classes) and control group (one class). Both experimental and control groups were subjected to pre-and post-testing. A 20-item tagged "Chemistry Practical Skills Acquisition on Soap and Detergent Production" (CPSASDP) structured on a 4-point rating scale developed by the researchers was the instrument used for data collection. It was validated by three experts in chemistry education and measurement and evaluation. The reliability estimate was computed using Cronbach's Alpha with coefficient index of 0.75. The three groups were taught the same concepts, but with different instructional arrangement. Data collected were analyzed using mean and standard deviation to for answering research questions and Z-test for answering the null hypotheses at 0.05 level of*

significance. The results revealed that both entrepreneurial skills engagements enhance skills acquisition if appropriately handled. In addition, the hypotheses were accepted because they only differed in their mean score differences. Based on the results, it was recommended among others that students should apply the skills acquired in Chemistry practical to enhance their entrepreneurship development.

Keywords: *entrepreneurship; chemistry education; empowerment.*

Introduction

The assurance of Nigeria government providing white-collar jobs for the unemployed youths has become a very difficult problem. This has caused serious threat of increasing unemployment rate. This situation calls for a serious paradigm shift for out of school or graduate to plan for a life-long survival. This rethinking is in line with the National policy on education (FRN, 2013, P. 12) where in the policy framework no (d), it states that an individual is to acquire appropriate entrepreneurial, technical and vocational job-specific skills for self-reliance and for agricultural, industrial, commercial and economic development as equipment for problem solving for the individual and the society general. This policy framework was timely enough as indicator that government is not capable of meeting the need and aspiration of the graduate youths. It was a timely policy, hence the need to find alternate means of reducing the high rate of unemployment in the time of failure on the part of government to meet its responsibility. As a result of this, the youth should be away of what is ahead of them. At this point, there is need for alternative means of survival through self-employment and self-fulfilment for the teaming youths. This implies that the Nigerian youths can no-longer depend on the nation's labour market for job after graduation. The situation has made it possible for realization of the emphasis of the policy on the need to device an alternative source of employment, that is, self-reliance to become the only hope to alleviate the ugly state.

This means that the unemployed youths have to be an entrepreneur. An entrepreneur is an initiator who designs, organizes and creates something new. This can be acquired through entrepreneurship education or apprenticeship. Conceptually, entrepreneurship education according to Albert and Poli (2017), is a formal conveyance of entrepreneurial skills competences, which in turn refers to as concepts, skills and mental awareness used by individuals during the process of starting and developing their growth-oriented ventures. To achieve this,

the individuals must acquire the needed skills to succeed in teaching of science related business opportunities. The entrepreneurial skills are basic skills necessary to start, develop and make future survival in business. It is on this premise, that, the Federal Republic of Nigeria (FRN, 2008), in her policy strategy for education, directs teachers to make curriculum a worthwhile avenue for learner–centered, activity based and practical work oriented. It emphasised on acquisition of entrepreneurial skills in every part of concepts that are practically based for the benefit of individual, school and society. In line with this, Agi (2019) confirmed that entrepreneurship education should aim at producing students with the knowledge and skills, capacities and attitudes to create visions for different and better system of doing things. Hence its broad objectives as pointed by Osuala (2019) are;

i. To provide meaningful education for youth which could make them self- reliant and subsequently encourage them to drive profit and be self -independent.
ii. To provide graduates with the training and support necessary to help establish a career in small and medium size business.
iii. To provide graduates with training skills that will make them meet the manpower needs of the society.
iv. To provide graduates with enough training in risk management and to make uncertainty bearing possible and easy.
v. To stimulate industrial and economic growth of rural and less develop area.
vi. To provide graduates enough training that will make them creative and innovative in dabbling into new business opportunity.

For the past decades, these objectives were ignored, until in the recent time where graduates could no longer get employment immediately due to their unskilled potential (Millennium Development Goals, 2015). This led into many venturing in entrepreneurial development; unfortunately, they are not properly equipped, nor prepared to face the challenges of the new survival. Of course, this informed the nature of the colonial inheritance that our curriculum was tailored to produce "job seekers" and not "job creators". To produce a job creator, the classroom instruction needs to have the 21st century skills. The implementer of the curriculum, the teachers need to have the spirit of entrepreneurial skills. Especially, the chemistry teachers need such skills to facilitate all the process embodied in the chemistry curriculum. The chemistry curriculum is quite rich with the necessary process skills (Dike & Williams, 2018). It is possible for the chemistry teachers to teach students effectively in a way that, the students will be

self- reliance and use the knowledge to make a living for themselves. Nancy (2020), posits that chemistry teaching program prepares students entrepreneurship relevance through laboratory activities, product making activities etc. These activities are planned to develop in students the needed self -reliance for future risk taking. The skills that can facilitate this classroom development are expected to be acquired through training in the school laboratory; guided by qualified teachers. The motivating factor is the expectation by the learner in making a fortune out of the entire experience. Obi (2021) pointed out that this leads to entrepreneurial engagement, where the aim is to improve individual investment opportunities and contribute to the development of the society. The individual should bear in mind that essentially, it involves creative risk taking, perseverance, innovativeness and problem-solving. It is all about showcasing the latent skills or talents and untapped creative abilities, by contributing effectively to the development of the society.

The period of cognitive development only should be backed with real oriented practicality which help in developing the psychomotor skills. It is quite unfortunate that most of the science teachers to guide the leaners are pay less attention in developing the skills, couple with lack of the necessary facilities to work with. The worst implication is that the graduates of the present school system lack the creative ability to stimulate critical thinking, besides the use of skills to create entrepreneurial oriented venture. The only inherent problem, pointed out by Onyirioha and Amina (2020) is the teaching of chemistry in schools using inappropriate methods, which have failed to expose students to economic relevance of chemistry and to develop in the students' the skills embedded in chemistry curriculum. The situation calls for urgent need, to seek the services of a trained entrepreneur as resource person, possibly as adjunct instructor to complement the efforts of the serving teachers, particularly chemistry or science related teachers. This would in no small measure boost the guided inquiring-oriented coaching needed for a successful breed of entrepreneurs. The work of Lev Vygostsky's social constructivist learning theory (1969) in his learning experience cited in Kalu and Neji (2021) is quite relevance to this study. The theory explicitly explained that learning occurs in social context and in an interaction phase with others. The pyramid of learning experience shows in hierarchical percent as remembering shares only 10% of what an individual reads, 20% of what is heard, 30% of what it is seen, 50% of what is heard and seen, 70% of what it says and 90% of what it is said and do. Of course, what the activity-based learning focus is students' involvement in what it is said and do in the laboratory practices.

Through these entrepreneurial skills are acquired, offering a paradigm shift that differs from the normal conventional cognitive skills that depend only on the bookish syndrome that most science teachers adopt.

Statement of the problem

Despite all efforts to produce secondary school graduates that could be self-sustained, particularly, as it was emphasized and provided in the National policy on education (FGN, 2013), stressing graduates at all level to be self-reliance. It appears there is no remarkable impart. Could it be that the teachers are not well prepared for this task? Could we go back to seek the services of private entrepreneurs to support the teachers as resource persons? If these are possible options for a successful self-reliance of present graduates, based on this, the study tried to find out how effective this could be achieved.

Hinged on these, this study tends to investigate the enhancing entrepreneurship opportunities through chemistry education: Implication for Nigeria youth empowerment in 21st century in Odeda Local Government Area. Specifically, the study was intended to find the:

1. level of chemistry students' acquisition entrepreneurial skills taught by resource entrepreneur
2. level of chemistry students' acquisition entrepreneurial skills taught both successful entrepreneur and chemistry teacher.
3. level of students' entrepreneurial skills acquisition when taught chemistry by chemistry teacher.

Research Questions

1. What is the level of chemistry students' acquisition entrepreneurial skills taught by resource entrepreneur?
2. What is the level of chemistry students' acquisition entrepreneurial skills taught by both resource entrepreneur and chemistry teacher?
3. What is level of chemistry students' acquisition entrepreneurial skills taught by chemistry teacher?

Hypotheses

HO_1: There is no significant difference in the level of chemistry students' acquisition of entrepreneurial skills taught by resource entrepreneur and chemistry teacher.

HO_2: There is no significant difference in the level of chemistry students' acquisition of entrepreneurial skills taught by resource entrepreneur and both entrepreneur and chemistry teacher.

HO_3: There is no significant difference in the level of chemistry students' acquisition of entrepreneurial skills taught by chemistry teacher and both entrepreneur and chemistry teacher.

Methodology

The design adopted for this study is the quasi-experimental in the type of pretest-post-test control nonrandomized group design. The study was conducted in Odeda Local Government Area of Ogun State. The study population comprised all the senior secondary school II chemistry students in Odeda Local Government Area of Ogun State. The population comprised of all chemistry students (numbering 954 students) in 18 public secondary schools in Odeda L.G.A. (Source: Teaching Service Commission, TSC, 2022). A sample of 142 chemistry students was drawn from three (3) schools out of the 18 public secondary schools in Odeda L.G.A. The three (3) schools had 3 chemistry intact classes and the study was carried out in their second term, when all the students had chosen their subjects combination for West African School Certificate Examination (WASCE). The number of chemistry students in the class in each school was made available by the Head of Science Discipline (HSD) in each school. Two schools were assigned as experimental groups (A and B). The "A" group comprised (44) students taught by resource entrepreneur, group "B" 42 students taught by both resource entrepreneur and the chemistry teacher, while group C, comprised (56) students the control group was taught by the chemistry teacher. The three groups were taught the skills required for entrepreneurial development of soap and detergent production. The experimental groups involved the entrepreneur by practically following the procedures as in the case of (A) soap. (Modified procedure by (Olotu & Ugwuanyi, 2017), as:

i. Addition of oil to a bigger container
ii. Addition of Sodium silicate
iii. Addition of colourants
iv. Stirring very well
v. Addition of dissolved Caustic Soda to the mixture with stirring
vi. Addition of essential oil
vii. Pouring of the soap to the mould to set overnight
viii. Slicing to bar or tablet after a day when the soap is hardened
ix. Labelling of soap for use.

Acquired skills

- Measuring
- Controlling variables
- Observation

- experimenting
- Classification

B. detergent production

i. Boiling of oil till it is white.
ii. Allowing the boiled oil to cool
iii. Addition of soap dye after cooling the oil
iv. Stirring the mixture
v. Addition of caustic soda to water with stirring
vi. Allowing the solution of caustic soda to cool
vii. Addition of caustic Soda mixture to the oil mixture
viii. Addition of essential oil
ix Stirring the entire mixture very well
x. Pouring the mixture to mould to harden
xi. Grating to powder when purely hardened

The skills involved

- Experimenting
- Controlling variables
- Measuring
- Observation
- Classification

The instrument for data collection was a Chemistry Practical Skills Acquisition on Soap and Detergent Production (CPSASDP) adapted by the researchers. The CPSASDP consisted of 20 items multiple choice students' acquisition of entrepreneurial skills, which carries 4 marks each, totaling minimum of 20 and maximum of 80 scores. The CPSASDP served as pretest and post-test for the 3 groups to measure students' acquisition of entrepreneurial skills. The instrument was validated by three experts in chemistry education and measurement and evaluation Department of Science Education University of Nigeria, Nsukka. The reliability estimate was computed using Cronbach's Alpha with coefficient index of 0.75. adjudged reliable at 0.75. The index showed that the instrument was suitable for the study. Mean and standard deviation were used to analyze the research questions, while Z – test was used to analyze the hypotheses at 0.05 level of significance.

Results

Research Question One: What is the level of chemistry students' acquisition entrepreneurial skills taught chemistry by resource entrepreneur?

Method	Pre-test		Post-test		Mean Gain
	N	$\bar{X}$	SD	$\bar{X}$	SD scores
Guided by Entrepreneur	44	1.67	0 .72	3.19	0 .44 1.52

Table 1: Mean and standard deviation of level of chemistry students' acquisition of entrepreneurial skills taught chemistry by resource entrepreneur

The data presented in table 1 shows that chemistry students taught by resource entrepreneur had a mean gain score (1.52) and standard deviation of 0.72 and 0.44 for pretest and post-test respectively. The instructional method showed enhancement in their acquisition of entrepreneurial skills in chemistry considering the initial baseline compared to the post test performance.

Research Question Two: What is the level of chemistry students' acquisition entrepreneurial skills taught by both resource entrepreneur and chemistry teacher?

Method	Pre-test		Post-test		Mean Gain
	N	$\bar{X}$	SD	$\bar{X}$	SD scores
Both (Methods)	42	2.00	0 .82	3.10	0 .49 1.10

Table 2: Mean and standard deviation of level of chemistry students' acquisition entrepreneurial skills taught by both resource entrepreneur and chemistry teacher

The data presented in table 2 reveals that chemistry students guided by entrepreneur and chemistry teacher had a mean gain score (1.10) and standard deviation 0.82 and 0.49 for pretest and post-test respectively. The instructional method showed enhancement in their acquisition of entrepreneurial skills in chemistry considering the initial baseline compared to the post test performance.

Research Question Three: What is level of chemistry students' acquisition entrepreneurial skills taught by chemistry teacher?

Method		Pre-test		Post-test		Mean Gain
	N	$\bar{X}$	SD	$\bar{X}$	SD	scores
Guided by Chemistry teacher	56	1.70	0.90	3.33	0.41	1.63

Table 3: Mean and standard deviation of level of chemistry students' acquisition entrepreneurial skills taught by chemistry teacher

The data presented in table 3 indicates that group taught by chemistry teacher alone had a mean gain score (1.63) with a standard deviation of 0.90 and 0.41 for pretest and post-test respectively. The instructional method showed enhancement in their acquisition of entrepreneurial skills in chemistry considering the initial baseline compared to the post test performance.

Hypothesis One: There is no significant difference between students taught chemistry entrepreneurial skills by resource entrepreneur and those taught by chemistry teacher.

Method	N	Mean	SD	Z-cal	Z-critical	Decision
Resource entrepreneur	44	3.19	0.44	.63	1.96	accepted
Chemistry teacher	56	3.33	0.41			

Table 4: Z-test comparison of mean scores of chemistry students' acquisition of entrepreneurial skills taught by resource entrepreneur and chemistry teacher.

From table 4, Z calculated value in respect of the instructional effects of integrating external entrepreneur and the chemistry teacher on the acquisition of entrepreneurial skills is 0.63 while the Z-critical value at 0.05 level of significance is 1.96. Thus, the Z-calculated value is less than the Z-critical value. The null hypothesis (H_{O1}) is therefore accepted. To this effect the researchers concluded that it does not matter how the students were exposed to entrepreneurial skills, either arrangement could enhance skills acquisition if appropriately handled.

Hypothesis Two: There is no significant difference between students taught entrepreneurial skills by successful entrepreneur and those taught by both conventional chemistry teacher and entrepreneur.

Method	N	Mean	SD	Z-cal	Z-critical	Decision
Resource entrepreneur	**44**	**3.19**	**0.44**	**0.86**	**1.96**	**Accepted**
Entrepreneur + Chemistry teacher	**42**	**3.10**	**0.49**			

Table 5: Z-test comparison of mean scores of students' acquisition of entrepreneurial skills taught by resource entrepreneur and those taught by both entrepreneur and chemistry teacher.

From table 5, Z calculated value in respect of use of entrepreneur resource and a combination of entrepreneur and chemistry teacher on the acquisition of entrepreneurial skills is 0.86 while the Z-critical value at 0.05 level of significance is 1.96. Thus, the Z-calculated value is less than the Z-critical value. The null hypothesis (H_{O2}) is therefore accepted. To this effect the researchers concluded that it does not matter how the students were exposed to entrepreneurial skills, either arrangement could enhance skills acquisition if appropriately handled.

Hypothesis Three: There is no significant difference between students taught entrepreneurial skills by chemistry teacher and those taught by both chemistry teacher and entrepreneur.

Method	N	Mean	SD	Z-cal	Z-critical	Decision
Chemistry teacher	**56**	**3.33**	**0.41**	**0.94**	**1.96**	**Accepted**
Entrepreneur + Chemistry teacher	**42**	**3.10**	**0.49**			

Table 6: Z-test comparison of mean scores of students' acquisition of entrepreneurial skills taught by chemistry teacher and those taught by both entrepreneur and chemistry teacher

From table 5, Z calculated value in respect of use of chemistry teacher and a combination of entrepreneur and chemistry teacher on the acquisition of entrepreneurial skills is 0.94 while the Z-critical value at 0.05 level of significance is 1.96. Thus, the Z-calculated value is less than the Z-critical value. The null hypothesis (H_{O3}) is therefore accepted. To this effect the researchers concluded that it does not matter how the students were exposed to entrepreneurial skills, either arrangement could enhance skills acquisition if appropriately handled.

Discussion

The findings revealed that all the instructional methods showed enhancement in their acquisition of entrepreneurial skills in chemistry considering their initial baseline compared to the post test performance. Although there was enhancement, further analyses revealed that there was no significant difference between one method and another. Thus, the null hypotheses (H_{O3} toH_{O3}) are therefore accepted. To this effect the researchers concluded that it does not matter how the students were exposed to entrepreneurial skills, either arrangement could enhance skills acquisition if appropriately handled. The results obtained are in line with the positions of Agi (2019) and Nancy (2020), that chemistry curriculum prepares students for entrepreneurship development, this takes place in the laboratory which the instructors prepare. To collaborate this fact, Dike and Williams (2018), affirmed the presence and inculcation of entrepreneurial skills in the curriculum. This means that, the classroom teacher's duty is to inculcate the embedded necessary process skills that will enhance individual entrepreneurial skills.

Conclusion

The results available from this study attested that chemistry teacher still adopt the necessary process skills as enshrined in the curriculum, the only thing requires of chemistry teacher in the classroom is to ensure that all the available and relevance skills necessary for science learning are applied towards a lifelong living. There is therefore the need to inculcate a positive perception of the learner towards personal survival through entrepreneurial skills enhancement.

Recommendations

Based on the outcome of the results, the following recommendations were made.

1. The students should apply the skills acquired in Chemistry practical to enhance their entrepreneurship development.
2. A retraining of chemistry teachers is recommended to update their knowledge of entrepreneurship skills development.
3. Parents should be involved in encouraging their children to improve entrepreneurially, by providing the necessary materials needed for their classroom experience.
4 Graduates at all levels should not shy away from local resource entrepreneurs as a way of showcasing their classroom knowledge in practical reality.

5. Chemistry teachers should be encouraged to use appropriate methods and skills that promote entrepreneurial skills enhancement.

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OPTIMIZING EVALUATION PRACTICES THROUGH RECONSIDERATION OF STUDENT ASSESSMENT STRATEGIES IN THE HYBRID UNIVERSITY ENVIRONMENT

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Abstract: *The theoretical foundation of the research problem highlights both a series of choices and priorities of university trainers regarding the adoption of authentic assessing strategies enriched in the virtual environment, as well as certain limits, difficulties and costs entailed by computerized testing, some applications and electronic platforms, testing of new face-to-face assessment tools etc. The aim of the research was to identify those assessing strategies used by university trainers in the virtual environment, which have proven their effectiveness in the online assessment of students and which have been maintained and enriched to be applied in hybrid university training alongside other modern*

assessment techniques and tools. The research questions that guided the entire study were: What evaluative strategies did university trainers adopt in the virtual environment? What were the most effective assessment strategies adopted according to the specifics of the discipline, assessment objectives and competencies? How were hybrid assessment practices optimized by adopting the new distance assessment strategies? What preferences did students have in hybrid assessment? What advantages and disadvantages are highlighted in adopting such assessment practices? The research methodology brought together qualitative and quantitative research methods, techniques and tools. Main findings describe the particularities of the assessment at the end of the hybrid trainings, the specifics of the design of synchronous and asynchronous student evaluation tasks, the customization of assessment platforms used in electronic evaluation, the adoption of new assessment methods and the improvement of face-to-face assessment techniques and tools.

Keywords: *digital assessment; evaluative strategies; digital assessment competence; assessment methods and tools.*

I. INTRODUCTION

Post-Covid paradigm shifts in university education regarding the integration of digital tools into the teaching process in higher education have led teachers to new training experiences and, at the same time, to the adoption of flexible forms of teaching, learning and evaluation. An important task of teachers in terms of experiences in university education is the curricular integration of IT resources that innovate evaluative strategies (Romero-Ariza, Abril, Quesada, 2017).

In the research report '*The future of assessment: Five Principles, Five targets for 2025*', experts argue that universities should use digital technology to turn assessment into a genuine learning tool by establishing and following five guiding principles: authentic, accessible, appropriately automated, continuous and secure assessment (JISC, 2020). Technology can more easily capture learning evidence, provide formative feedback and record learning progress. At the same time, British experts believe that the annual summative assessment could be replaced by the on-demand assessment, through which the students can demonstrate their learning when they feel ready. Some researchers are optimistic about the possibilities offered by a

combination of artificial intelligence and the generous offer of learning to transform the way we evaluate learning. So artificial intelligence could be used to provide students with a personal learning assistant and help with professional development. British Professor Rose Luckin believes that artificial intelligence will be able in the near future not only to guide the students through the content to be learned but to help evecn understand the process of learning as such, the stages taken in learning and the motivation underlying learning (JISC, 2020).

Senge (2016) stresses the importance of assessments meant to beome part of learning, not those assessments used for criticism, ranking and certification. Assessment as part of the learning process supports autonomous and self-regulated learning, students can set clear goals based on evaluative data and monitor their own progress. Formative, learning-oriented assessment provide teachers important data on the entire learning and development process of students. The studies of Black and William (1998), Boud and Falchikov (2006) highlight the inclusive dimension of assessment, to orient students towards reaching their maximum potential in learning.

Siemens and its collaborators (2015) draw attention to the fact that students achieve better academic results in blended learning environments compared to online or face-to-face environments. Several studies on blended learning indicate the need for innovation in the design and implementation of teaching and assessment strategies. Researcher Cao (2023) draws the attention of teachers to take into account the needs of students and the characteristics of the learning environment when implementing the blended learning system.

Formative evaluative processes are designed to make students more aware of their level of competence, the way they solve tasks, their own strengths to strengthen them, as well as weaknesses to correct and improve them. This process of self-regulation is essential to shape students' lifelong learning skills. Formative assessment, oriented towards learning, is a complex process that requires active participation and involvement from students, and from teachers, resources and didactic skills that favour this process.

Feedback is a central element on which continuous forms of assessment are based. Hattie (2014) starts from the premise that teachers are aware of the importance of feedback and explains the importance of feedback provided by them in relation to the 3 levels: task, process and self-regulation. The most common type of feedback is the one offered at the level of the task called 'corrective feedback or feedback of knowledge of results' (p. 242), being given either through the questions of the teachers, or through the request for new, additional or different information, or through the observations made on the topic.

The second level is 'feedback on the methods used to achieve the result or complete the task. It can lead to offering alternative approaches, reducing cognitive tasks, supporting the development of learning strategies and identifying mistakes, providing clues for a more efficient information search, recognizing the relationship between ideas, and using task-centred approach'. (p. 244). The third level is focused on self-regulation or monitoring by the learner of their own learning process, and 'feed-back at this level can improve students' skills in self-assessment, provide greater confidence for further involvement in the task, support the student in requesting and accepting the feed-back, and increase their willingness to put effort into seeking and using the feed-back information'. (p. 245).

We strongly agree with Professor Cucoș C. (2021) on the idea that that 'the assessment problem must invite a responsible, multi-referential, multi-dimensional approach', since it was 'sometimes reduced to a formal and stereotypical procedure for processing individual assessments based on a normative reference system, agreed at system or institution level'. (p. 334) The authors of this study are interested in the operational decisions of the teachers in the Romanian academic environment regarding the assessment of the students, the forms and types of assessment adopted by them, the methods, techniques and tools for assessing the performance of learning used by teachers both face-to-face and/or at a distance, their coherence in relation to predetermined outcomes, the manner in which the results of the assessments are capitalized in the new learning processes.

II. RESEARCH METHODOLOGY

The research took the form of a fact-finding investigation, the aim of the research being that of identifying those assessing strategies used by university trainers in the virtual environment, which have proven their effectiveness in the online assessment of students and which have been maintained and enriched to be applied in hybrid university training alongside other modern assessment techniques and tools.

The objectives of the research:

O1. Aimed at highlighting the particularities of designing evaluative situations in the virtual environment, the assessment methods and tools used by university trainers in hybrid training, their adequacy with the assessment objectives and the targeted competencies.

O2. At the same time, the students' opinions were polled regarding the assessment strategies adopted by their trainers in the hybrid training in terms of advantages, disadvantages, the consonance of the methods and assessment tools applied with the specific competencies targeted by

completing some university subjects from the initial training plan of future teachers for primary and preschool education.
The participants in the research were 33 teachers from 6 university centres in Romania and 226 students from the University of Pitești (future teachers for primary and preschool education).
The research data was collected and measured through the survey on the basis of questionnaires. 2 questionnaires in format *Google Forms* were built by the authors. The questionnaires were applied electronically and the completion was voluntary. The study period was May-June 2023.

III. RESULTS AND DISCUSSIONS

The surveyed teachers (84.8%) state that they have been using distance assessment strategies since the Covid-19 pandemic and consider the most effective strategies for assessing the student learning outcomes that they have maintained at the present time (fig.1.) are: e-portfolio (45.5%), project-based assessment (42.4%) and hybrid assessment (30.3%). E-portfolios are valued as a powerful tool for feedback and assessment in teaching, as they help teachers track the learning process and foster students' lifelong self-regulation, metacognition and learning skills.

Figure. 1 The most effective assessment strategies adopted by the teachers participating in the study

The teachers participating in the study were also asked what changes they brought/would bring to improve the evaluative practices of the students (fig. 2). They mentioned that the evaluative practices of the students have changed by adopting those pedagogical strategies of

combining those methods, techniques and tools specific to distance assessment with those of face-to-face assessment, in relation to the pre-determined goals of each teacher, with the moments chosen for evaluation and with the frequency of use. The main changes regarding the evaluative practices of post-Covid students mentioned by the teachers participating in the study are the following: the use of the e-portfolio (48.5%), the creation of electronic tests on the University platform (42.4%) and the encouragement of mutual assessment of students (39.4%), followed by:

- 36,4 % use of Google tools in assessment;
- 24.2 % % introduction of reflection tools (electronic journal, KWL, etc.);
- 21,2 % use of electronic concept maps;
- 9.1 % podcast/vlog/blog/slog.

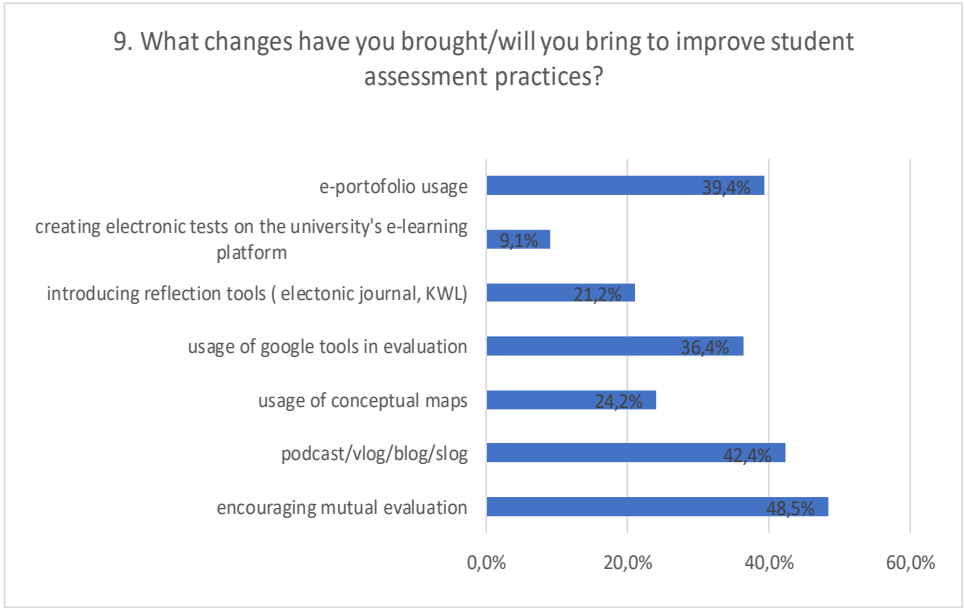


Figure. 2 Types of changes adopted/proposed by teachers to improve student assessments

In the opinion of the respondent teachers, the main advantages (fig.3) of the adoption of hybrid evaluative strategies are primarily the possibility to provide quick, personalized, constructive feedback (66.7%), but also the transparency of assessment criteria and procedures (48.5%), material resources saved (48.5%) „the possibility to easily store the evaluation evidence (48.5%)", digital skills development (48.5%), time saved (45.5%), automatic correction and fast ranking (39.4%), formative capitalization of the feedback received

(33.3%), followed by the advantages of audio-video recording of the assessment and the possibility of simulation of electronic testing.

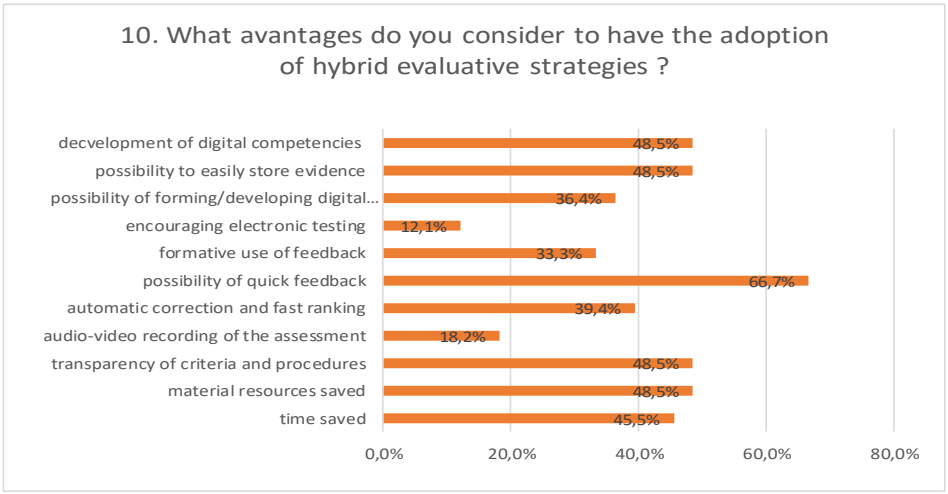


Figure.3. The main advantages of adopting hybrid evaluative strategies

Among the disadvantages, the respondent teachers identify primarily technical problems (78.8%) that may occur in the distance assessment, but also the risk of exam fraud (72.7%), psychological stress (18.2%) and even cyber-bulling (12.1%).

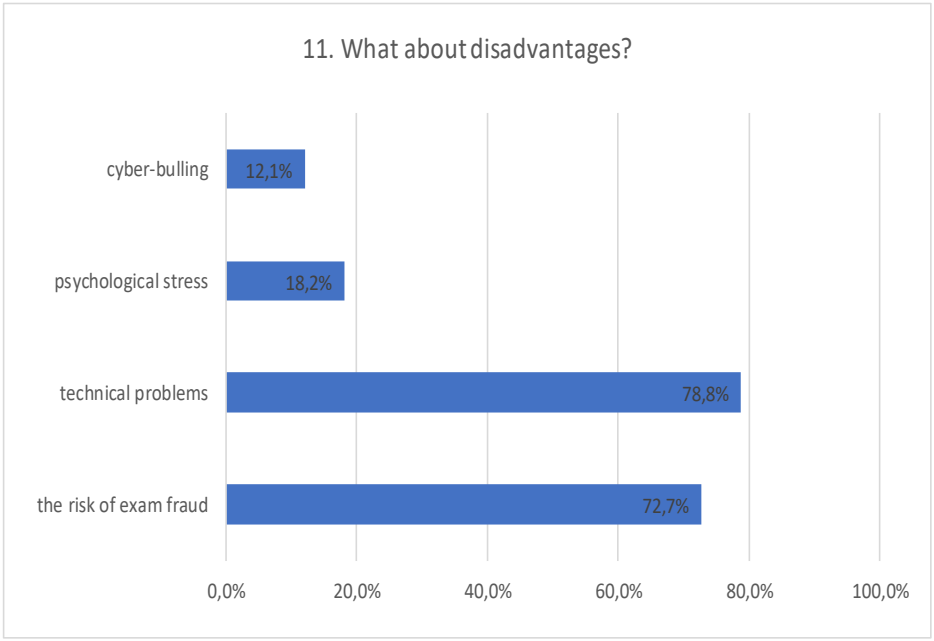


Figure.4. The main disadvantages of adopting distance evaluative strategies

Regarding the knowledge of students' preferences in assessment (fig.5), the teachers participating in the study mentioned that most of the students (72.7%) prefer to be assessed based on the e-portfolio (33.3%), other students prefer to present orally individual or group project (33.3%), and other students express their preference for electronic testing (33.3%). The arguments are given by the students themselves when asked '*Why do you prefer the strategies you chose? Argue briefly!*'

On the project-based oral assessment, the arguments of the students participating in the study were as follows: '*they can see everyone's work, and the teacher can also ask additional, clarifying questions; develop communication skills and teamwork; involvement is greater in the learning process having the opportunity to analyse, research and discover the knowledge ourselves, to form ourselves some skills of intellectual work and not only; involves creativity, synthesis capacity and individual contribution; teaches you to learn and trains you.*

On electronic testing, students argue that it '*helps in self-assessment and allows managing emotions more easily*'.

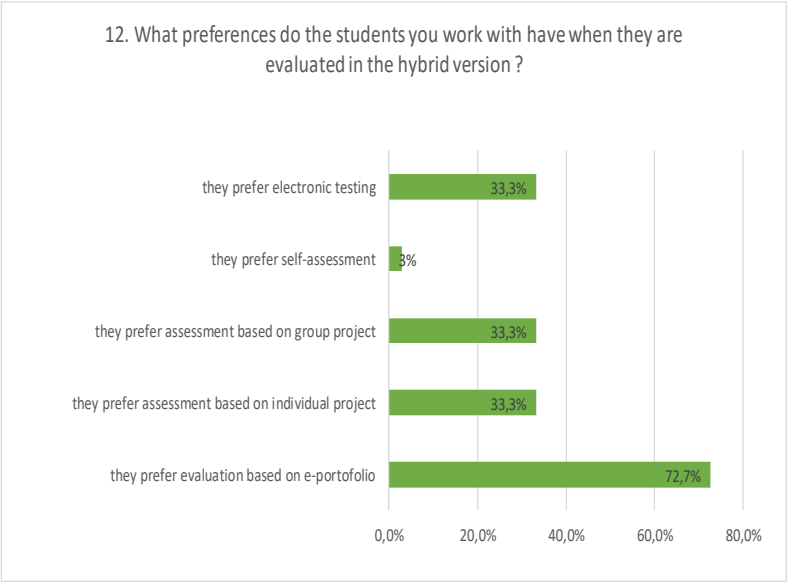


Figure. 5. Student preferences for different assessment strategies

Students were asked which assessment strategies they most prefer for obtaining valuable feedback, understanding the importance of assessment for improving learning and acquiring skills. 30.1% of the respondent students mention as preferred evaluative strategies are

written assessment, e-portfolio (20.4%) and assessment based on individual project, which leads us to the conclusion that these strategies are often used by their teachers depending on the specifics of the respective academic subjects, the objectives and competences of the assessment and are well known by the students. From these student preferences, teachers can go into analysis and debate to improve academic assessment practices.

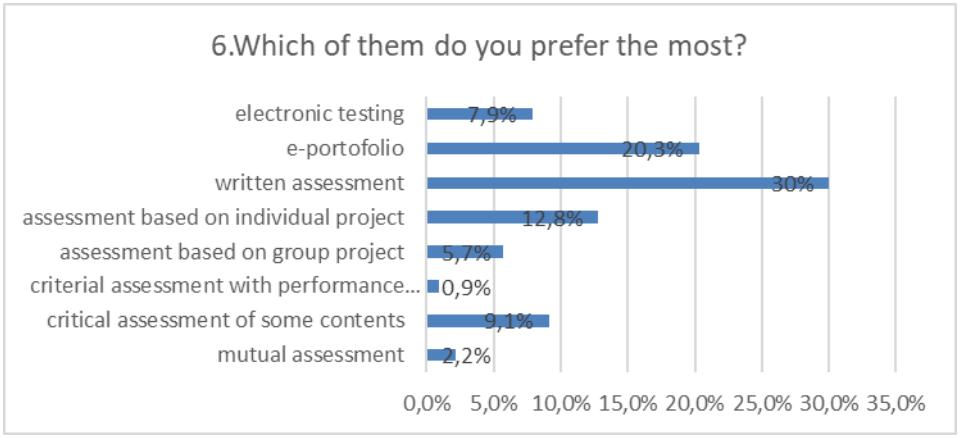
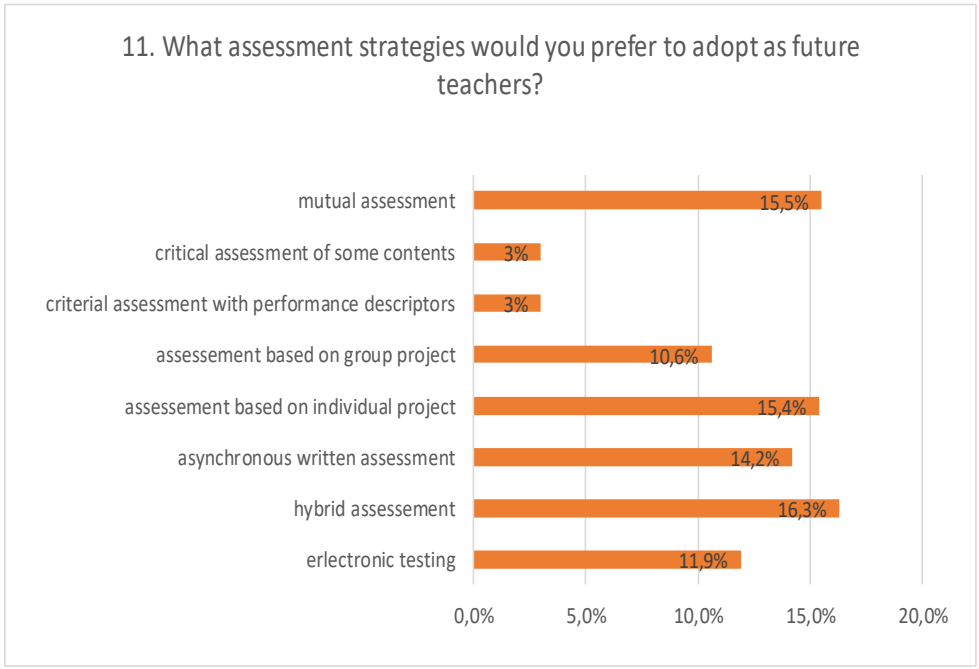


Figure.6. Assessment strategies preferred by students-future teachers

At the same time, the students were also asked what assessment strategies would they prefer as future teachers (fig. 8). It is interesting that 16.4% of the respondent students mention the critical assessment of some contents, followed by the assessment based on individual project (15.5%) and the criterial assessment with performance descriptors (11.5%), which leads us to the conclusion that only the project-based assessment is the strategy valued after the completion of academic studies and considered effective to be applied in the classroom as future teachers along with other assessment strategies that carefully, objectively and constantly monitor learning outcomes.



Regarding the knowledge of the assessment criteria (fig.7), 47.8% of students mention that to a large extent they were presented to them by teachers, only 14.2% mentioned that they know them to some extent, which leads us to the conclusion that there are teachers who do not insist on explaining the assessment criteria as there are also students who do not attach much importance to the assessment criteria in the study of a subject.

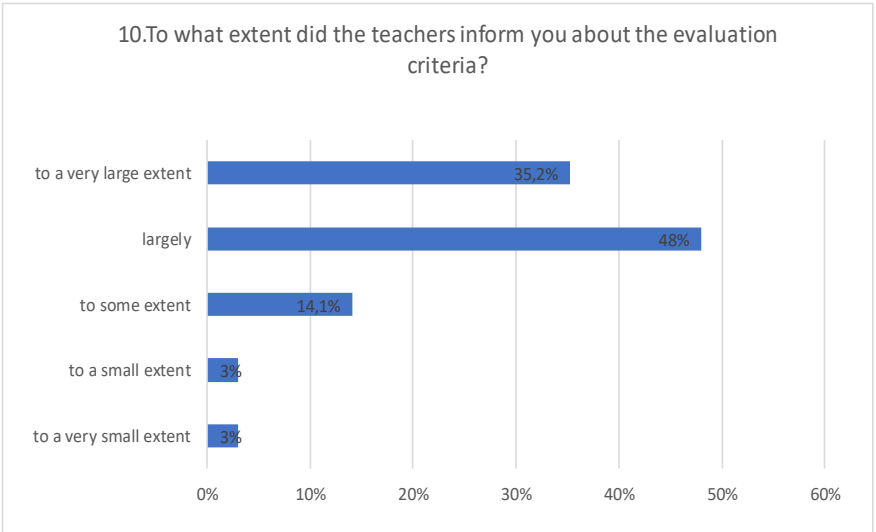


Figure.7. Share of briefings on assessment criteria

IV. CONCLUSIONS

In order to capture the most comprehensive picture of the performance and progress of the students participating in the study, respondent teachers design and apply effective assessment strategies both face-to-face and at a distance, using a variety of assessment methods, techniques and tools. Electronic assessments, although they were a great challenge for most teachers during the Covid-19 pandemic, are still used today for efficiency, objectivity, inclusiveness, authenticity and validity through which quality requirements are ensured in the assessment. Electronic testing although at first it proved difficult and even generated problems such as academic honesty, plagiarism, fairness is still practiced today in some academic subjects, even if only for simulations or in continuous assessments.

Several students mentioned some barriers in distance assessment, related to: lack of a performing device for using the necessary platforms and applications, lack of internet connection, lack of access to the necessary software and applications, but also lack of digital skills necessary to use these platforms. Therefore, the complexity of course design, technical difficulties and increased objectivity of assessment, problems of internet connectivity or low digital skills still remain obstacles for teachers to pass. It is essential that universities ensure that students have all the equipment and conditions necessary for assessment also at distance, not just face-to-face. Students felt the lack of feedback from teachers on the implementation of the projects, which were subsequently subject to assessment.

For quantitative and qualitative monitoring of the teaching activities carried out, with automated display of the results and to monitor the level of understanding of the learning contents by students, for constant feedback and to be able to resume certain aspects less understood by the majority of students teachers and students prefer online formative assessment tools, continue.

Optimising assessment practices in academic environment involves a well-planned approach to ensure that the assessment process is efficient, fair and relevant to the academic context. The clear communication of expectations and evaluation criteria to all students is essential, as well as the exchange of best practices between teachers for the constant improvement of the assessment process. The following conclusions are drawn from the study:

The successful integration of technology into the academic teaching process and the adoption of complex and varied assessment tools leading to long-term learning must be an objective assumed by each teacher to develop critical thinking, metacognition and autonomy and responsibility skills of students;

The need for a greater focus on authentic, formative, systematic and analytical assessment, adapted to the educational needs of students, which would actively involve them in the evaluative processes and contribute to the formation of their capacity for self-regulation of learning and the improvement of their professional competences;
Refining progress-oriented formative assessment practices to produce learning, in which learning and assessment are built together, in a coherent manner, where formative feedback is a priority;
Encouraging peer evaluations to provide opportunities for students to learn from each other, interact and understand assessment criteria and standards, use them in peer assessments, and provide real feedback to peers;
Greater encouragement of self-assessment practices, reflective processes following self-assessments and assessments conducted in varied contexts, including hybrid, to develop students' critical thinking, value judgments and drive the improvement of sustainable learning.
The need for increased engagement of students in metacognitive processes, which include self-monitoring and self-assessment to enhance reflection and self-regulation of learning.

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LEVERAGING PUBLIC PRIVATE PARTNERSHIP (PPP) APPROACH FOR TECHNOLOGY-DRIVEN TEACHING AND LEARNING OF ENTREPRENEURSHIP IN SOUTHEAST NIGERIAN UNIVERSITIES

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Abstract: *The study examined leveraging Public Private Partnership (PPP) approach for technology-driven teaching and learning of entrepreneurship in Southeast Nigerian Universities. Two research questions were answered while two hypotheses were tested. Multistage sampling technique was used to select 203 respondents for the study. The instrument for data collection for the study was a structured questionnaire and face-validated by three experts. To obtain the reliability of the instrument, Cronbach Alpha reliability technique was used which yielded a reliability coefficient of 0.934, indicating that the instrument was about 93% reliable for data collection for the study. Out of the 203 copies of the questionnaire administered, 194 copies were completely responded to, returned and considered suitable for the study. Data were analysed using mean and t-test statistics. From the data analysed, the results identified 12 Public Private Partnership (PPP) approaches for technology-driven teaching and learning of entrepreneurship studies and 15 potentials of well-coordinated Public Private Partnership (PPP) for technology-driven teaching and learning of entrepreneurship studies in southeast Nigerian Universities. The results on the hypotheses tested showed that no significant ($p<0.05$) difference existed in the mean ratings of the responses of Entrepreneurship Studies*

Lecturers and Administrators. Based on these findings, the study recommended improved collaborations of public institutions with private investors for adequate funding and management of entrepreneurship programmes to actualize technology-driven instruction for quality education in Nigeria.

Keywords: *public private partnership; technology-driven instruction; entrepreneurship*.

Introduction

Entrepreneurship activities are key drivers of national growth. Entrepreneurship is the willingness and ability of individuals to seek out investment opportunities in an environment, be able to establish it as well as run such enterprise successfully based on the identifiable opportunities (Agboola, 2015). Entrepreneurship deals with the effort to equip trainees with the willingness and ability to invest in opportunities, to establish and to run an enterprise successfully. Aja, Onoh, and Igwe (2018), argued that entrepreneurship is regarded as the engine room for every country's economic development because it is a sure way of generating employment opportunities, providing needed manpower for industrial development, marketing and market factor growth, capacity building on the citizenry and resource distribution which are necessary paraphernalia for national development.

The significance of entrepreneurship activities cannot be overemphasized. Madichie, Nkamnebe, and Ekanem (2020), for instance noted that entrepreneurial activities across the globe have been reported to contribute as much as 60% of global economic output. In the specific case of Nigeria, the International Monetary Fund indicates that Nigerian entrepreneurial sector of the economy grew at the rate of 8.5% between 2015 and 2017. It accounted for about 65% of GDP which has helped to absorb unemployment in the labour market (Madichie, Gbadamosi, and Rwelamila, 2021). In affirmation, Omeje, et al (2020) observed that job creation and self-reliance of youths could be enhanced through deliberate government policies geared toward functional entrepreneurial education and training programmes in the country. This is because, Nigerian education is faced with myriad of challenges ranging from under funding, infrastructural decay, gross brain-drain to inadequate provision of needed instructional materials and facilities which can be salvaged through functional Public Private Partnership (PPP) approach in the education sector.

Public Private Partnership is an agreement between governments and actors in the private sector for the supply of public infrastructure, facilities and services through contractual arrangement such that

partners' efforts are complementary (Aja, 2020). According to Izuwah (2017), Public Private Partnership is a contractual agreement between a public agency (Federal, State or Local) and a private sector entity. Through this agreement, the skills and assets of each sector (public and private) are shared in delivering a service or facility for the use of the general public. Manuel (2012) emphasized that public private partnership approach when effectively coordinated has the capacity to prudently harness the needed expertise from pools of qualified labour. It also deals with prerequisite resources in both the public and private sectors, utilizing the combined resources for optimal service delivery, thereby making it easy for the government to focus mainly on its assigned regulatory functions.

It is imperative to state that sustainable access to socio-economic products and services can be accomplished through public private partnerships, where the government delivers the minimum standard of services, products and/or care; with the private sector bringing skills and core competencies, while donors and businesses bring funding and other resources (Adirieje, 2023). Hence, Umar and Babalola (2016), recognized the need for government clamour for improved public private partnership in the nation's educational management; most especially in the area of technology-driven instruction in the contemporary global village. Roland (2015), submitted that modern technology is an important tool in achieving success in educational programmes.

Technology-driven instruction is a critical component at all levels of education from kindergarten to middle school through high school, college, and beyond. When integrated seamlessly and thoughtfully both inside the classroom and at home, technology not only makes the lives of educators easier, but also engages and motivates students to learn while preparing them for the future (Intel Corporation, 2022). Similarly, Ganimian, Vegas, and Hess (2023), highlighted the comparative advantages of technology-driven instruction to include scaling up standardized instruction, facilitating differentiated instruction, increase learners' engagement in learning and expand opportunities to practice. Palia (2021), on the other hand stated that the transition from traditional classroom learning to electronic-based instruction has presented great opportunity to sustain learning engagement of students.

Technology provides ways for students to learn anywhere and at any time, and affords the possibility of providing learning at a pace that is comfortable for students using modern teaching and learning tools. Ganimian, Vegas and Hess (2023), further noted that while technology has positively affected most sectors of the economy and changed how

we communicate, access information, work and interact; its impact in education sector of developing countries has been limited to a great extent. The limited impact of technologies in teaching and learning in developing countries is primarily due to poor funding and commitment of the government on one hand, and weak public private partnership on the other. It is thought that when schools engage modern technologies to drive teaching and learning of entrepreneurship education through public private partnership approach, there will be significant improvement in learning and entrepreneurial engagement of learners on graduation from their training institutions. Hence, this study examined the leveraging of public private partnership (PPP) approach for technology-driven teaching and learning of entrepreneurship in Southeast Nigerian Universities.

Purpose of the Study

This study broadly investigated leveraging public private partnership (PPP) approach for technology-driven teaching and learning of entrepreneurship in Southeast Nigerian Universities. Specifically, the study identified:

1. Public Private Partnership (PPP) approaches for technology-driven teaching and learning of entrepreneurship studies in Southeast Nigerian Universities.
2. The potentials of well-coordinated Public Private Partnership (PPP) for technology-driven teaching and learning of entrepreneurship studies in Southeast Nigerian Universities.

Research Questions

In line with the two specific purposes for the study, the following two research questions were answered

1. What are the Public Private Partnership (PPP) approaches for technology-driven teaching and learning of entrepreneurship studies in Southeast Nigerian Universities?
2. What are the potentials of well-coordinated Public Private Partnership (PPP) for technology-driven teaching and learning of entrepreneurship studies in Southeast Nigerian Universities?

Research Hypotheses

$H0_1$: There is no significant difference in the mean ratings of Entrepreneurship Lecturers and Administrators on Public Private Partnership (PPP) approaches for technology-driven teaching and learning of entrepreneurship studies.

$H0_2$: There is no significant difference in the mean ratings of Entrepreneurship Lecturers and Administrators on the potentials of well-coordinated Public Private Partnership (PPP) for

technology-driven teaching and learning of entrepreneurship studies.

METHODS

Two research questions and tested two hypotheses were developed to guide the study using descriptive survey research design. The study was carried out in South Eastern Nigeria comprising of five States of Abia, Anambra, Ebonyi, Enugu and Imo States. Multistage sampling technique was used to select 203 respondents for the study. The first stage was random sampling of two states (Anambra and Enugu) out of the five existing states in South Eastern Nigeria. The second stage of the sampling was purposive selection of the four public Universities in the two states which are: (i) Chukwuemeka Odumegbu Ojukwu University, Uli Anambra State, (ii) Nnamdi Azikiwe University, Awka, Anambra State, (iii) University of Nigeria, Nsukka, Enugu State and (iv) Enugu State University of Science and Technology, Enugu. The third stage involved, all the 120 administrators (4 Registrars and 4 Deputy Registrars, 52 Deans and 52 Deputy Deans of Faculties/Colleges, 4 Directors and 4 Deputy Directors of Entrepreneurship Centres) and 83 Lecturers of Entrepreneurship in the four selected Universities making a total of 173 respondents. Hence, the 203 respondents (120 Administrators and 83 Entrepreneurship Lecturers) constituted the sample from which data were collected for the study.

The instrument for data collection for the study was a structured questionnaire. The questionnaire was structured into three sections A, B and C. Section A of the questionnaire was made to collect data on personal characteristics of the respondents such as their status as Registrars/Deputy Registrars, Deans/Deputy Deans, Directors/Deputy Directors and Lecturers. Section B was structured to obtain data on Public Private Partnership (PPP) approaches for technology-driven teaching and learning of entrepreneurship studies while Section C was made to elicit data on the potentials of well-coordinated Public Private Partnership (PPP) for technology-driven teaching and learning of entrepreneurship studies. The response option for sections B and C of the questionnaire was 4-point rating scale of Strongly Agree (SA) = 4; Agree (A) = 3; Disagree (D) = 2 and Strongly Disagree (SD) = 1. The instrument was face-validated by three experts. These include two Senior Lecturers in Entrepreneurship Centre and one Expert in Measurement and Evaluation in Michael Okpara University of Agriculture, Umudike, Abia State. To obtain the reliability of the instrument, 10 copies of the instrument was administered to 10 Lecturers in Entrepreneurship Centre in Michael Okpara University of

Agriculture, Umudike, Abia State, which is out of the coverage of the study. Data collected from the trial testing was analysed using Cronbach Alpha reliability technique which yielded a reliability coefficient of 0.934 indicating that the instrument was about 93% reliable for data collection for the study.

Data for the study were collected by the researchers with the help of four research assistants. Each of the four research assistants handled data collection from one of the four universities involved in the study. Out of the 203 copies of the questionnaire administered, 194 copies were completely responded to, returned and considered suitable for use. Data extracted from the returned questionnaire were analysed using mean, standard deviation and t-test statistics at 0.05 level of significance. The 4-point response options were assigned values as follows:

Response Category	***Value***	***Boundary Limit***
Strongly Agree	(SA)	4 3.50 – 4.00
Agreed	(A)	3 2.50 – 3.49
Disagree	(D)	2 2.00 – 2.49
Strongly Disagree	(SD)	1 1.00 – 1.99

Based on this computation, any item whose mean value fell within 3.50 – 4.00 was interpreted as "Strongly Agree"; those with mean values within 2.50 – 3.49 were interpreted as "Agree"; while items with mean values within 2.00 – 2.49 and 1.00 – 1.99 were interpreted as "Disagree" and "Strongly Disagree" respectively. The hypothesis of no significant difference was rejected when the t-cal (t-calculated) value was greater than t-tab (t-table) value of 1.96 while the hypothesis of no significant difference was accepted when the t-cal (t-calculated) value was less than t-tab (t-table) value of 1.96 at obtained degree of freedom.

RESULTS

Research Question One

What are the Public Private Partnership (PPP) approaches for technology-driven teaching and learning of entrepreneurship studies in southeast Nigerian Universities?

The data for answering research question one are presented in Table 1 below.

SN	**PPP for technology-driven instruction include:**	**X**	**SD**	**Rmks**
1	Old Students Association of entrepreneurship studies graduates'	3.47	0.48	**A**

	involvement in provision of modern instructional facilities.			
2	Involvement of community-based professional association in providing modern technologies for teaching entrepreneurship.	3.66	0.53	**SA**
3	Political parties' involvement in financing technologies for teaching entrepreneurship studies in Nigerian schools.	2.47	0.47	**D**
4	Finance of entrepreneurship studies programme by community-based philanthropists.	3.61	0.54	**SA**
5	Tasking students in fund raising for procurement of ICT gadgets for teaching entrepreneurship studies.	2.32	0.72	**D**
6	Involvement of Nigerian in Diaspora in supplies of modern teaching facilities in entrepreneurship studies programme.	3.59	0.74	**SA**
7	Non-governmental Organizations (NGOs) corporation in financing technology-driven instruction in entrepreneurship.	3.65	0.52	**SA**
8	Setting up Entrepreneurship Studies Trust Fund (ESTF) for improved financing of entrepreneurship studies programme.	3.75	0.62	**SA**
9	Parents-School Management Association for improved provision of ICT facilities for entrepreneurship study programme.	2.44	0.78	**D**
10	Involvement of religious organizations in provision of ICT-facilities in entrepreneurship studies programmes.	3.57	0.53	**SA**
11	Build Operate and Transfer (BOT) arrangement of ICT-based entrepreneurship laboratories between private & public institutions.	3.80	0.60	**SA**
12	Facility Operations, Maintenance, and Management arrangement between private and public institutions.	3.64	0.53	**SA**
13	Sale/Leaseback arrangement between private and public institutions.	3.48	0.61	**A**
14	Supplies of ICT facilities for teaching and learning in Entrepreneurship centres by ICT-based companies.	3.71	0.48	**SA**
15	Organized skill training for lecturers on technology-driven instruction by ICT-	3.76	0.63	**SA**

experts in informal sector.			
Pooled Mean	**3.39**	**0.58**	**A**

Note: ***X*** **=** *Mean;* ***SD*** *= Standard Deviation;* ***SA****= Strongly Agreed;* ***A*** *= Agreed;* ***D*** *= Disagreed;* ***n*** *= number of respondents.*

Table 1: Public Private Partnership (PPP) Approaches for Technology-driven Teaching and Learning of Entrepreneurship Studies (n= 194).

The data presented in Table 1 above revealed that the mean ratings of the respondents on 10 of the 15 items ranged from 3.57 to 3.80 which all fell within the boundary limit of 3.50 – 4.00. This indicates that respondents "Strongly Agreed" that the identified 10 items are Public Private Partnership (PPP) approaches for technology-driven teaching and learning of entrepreneurship studies. The mean values of items 1 and 13 are 3.47 and 3.48 respectively which fell within the boundary limit of 2.50 – 3.49. This indicates that the respondents "Agreed" that items 1 and 13 are Public Private Partnership (PPP) approaches for technology-driven teaching and learning of entrepreneurship studies. On the other hand, the mean values on items 3, 5 and 9 are 2.47, 2.32 and 2.44 respectively which fell within the boundary limit of 2.00 – 2.49. This implies that respondents "Disagreed" with the three items as being part of Public Private Partnership (PPP) approaches for technology-driven teaching and learning of entrepreneurship studies in southeast Nigerian Universities.

Hypothesis One

$H0_1$: There is no significant difference in the mean ratings of Entrepreneurship Lecturers and Administrators on Public Private Partnership (PPP) approaches for technology-driven teaching and learning of entrepreneurship studies.

The data for testing hypothesis one are presented in Table 2 below.

Variables	N	X	SD	DF	Std. Error	t-Cal	t- tab	p-value	Decision
Entrepr Lecturers	76	3.37	0.54						
				192	0.022	0.35	1.96	0.53	**NS**

Administrators	117	3.40	0.48

Note: NS = Not Significant at 0.05.

Table 2: Test of significant difference in the mean ratings of Entrepreneurship Lecturers and Administrators on Public Private Partnership (PPP) approaches for technology-driven teaching and learning of entrepreneurship studies

The data presented on t-test statistics in Table 2 revealed that the t-calculated (t-cal) value of 0.53 is less than the t-table (t-tab) value of 1.95 at 192 degree of freedom. This indicates that there was no significant ($p<0.05$) difference in the mean ratings of the responses of Entrepreneurship Studies Lecturers and Administrators on Public Private Partnership (PPP) approaches for technology-driven teaching and learning of entrepreneurship studies in South Eastern Nigerian Universities. Consequently, the null hypothesis of no significant ($p<0.05$) difference in the mean ratings of the responses of the lecturers and administrators is accepted on hypothesis one.

Research Question Two

What are the potentials of well-coordinated Public Private Partnership (PPP) for technology-driven teaching and learning of entrepreneurship studies in South Eastern Nigerian Universities?

The data for answering research question two are presented in Table 3 below.

SN	Potentials of PPP approach to technology driven instruction include:	X	SD	Rmks
1	PPP approach to technology driven instruction is a means of enhancing entrepreneurship studies	3.55	0.57	**SA**
2	Well-designed public-private partnership will improve efficiency in teaching and learning entrepreneurship studies.	3.78	0.45	**SA**
3	Resources are more efficiently managed under public private partnership arrangement.	3.23	0.51	**A**
4	PPP approach to technology driven instruction will stimulate entrepreneurial capacity of Nigerian graduates.	3.55	0.66	**SA**
5	Sharing burdens between public and private sectors lessens the risks of both partners.	3.64	0.52	**SA**
6	PPP approach to technology driven instruction gives room for innovation in	3.54	0.58	**SA**

	public education system.			
7	It stimulates partnership between private and public actors in technology-driven curriculum development and implementation.	3.49	0.47	**A**
8	Promote funding of entrepreneurship studies by private organizations and individuals.	3.77	0.49	**SA**
9	Public-private partnership helps boost welfare and motivational packages of human resources in public education sector.	3.43	0.61	**A**
10	Public-private partnership will enhance the absorption of entrepreneurship graduates for gainful employment on graduation.	3.75	0.57	**SA**
11	Public-private partnership will encourage scholarship to outstanding entrepreneurship students for further studies.	3.45	0.53	**A**
12	PPP approach to technology driven instruction will increase capacity building in public education sector of a nation.	3.51	0.48	**SA**
13	Quality assurance of entrepreneurship studies will be guaranteed through effective public-private partnership arrangement.	3.34	0.56	**A**
14	PPP approach to technology driven instruction will give room for more inclusiveness in entrepreneurship studies in particular	3.63	0.71	**SA**
15	PPP approach to technology driven instruction will promote higher academic achievement of entrepreneurship students	3.48	0.57	**A**
	Pooled Mean	**3.54**	**0.55**	**SA**

Note: ***X*** **=** *Mean;* ***SD*** *= Standard Deviation;* ***SA****= Strongly Agreed;* ***A*** *= Agreed;* ***n*** *= number of respondents.*

Table 3: Potentials of well-coordinated Public Private Partnership (PPP) for technology-driven teaching and learning of entrepreneurship studies (n= 194).

The data presented in Table 3 above showed that the mean ratings of the respondents on 9 of the 15 items ranged from 3.51 to 3.78 which all fell within the boundary limit of 3.50 – 4.00. This implies that respondents "Strongly Agreed" that the identified nine (9) items are potentials of well-coordinated Public Private Partnership (PPP) for

technology-driven teaching and learning of entrepreneurship studies. The mean values of the remaining 6 items specifically items 3, 7, 9, 11, 13 and 15 are 3.23, 3.49, 3.43, 3.45, 3.34 and 3.48 respectively which fell within the boundary limit of 2.50 – 3.49. This implies that respondents "Agreed" that the remaining 6 items are the potentials of well-coordinated Public Private Partnership (PPP) for technology-driven teaching and learning of entrepreneurship studies in southeast Nigerian Universities.

Hypothesis Two

$H0_2$: There is no significant difference in the mean ratings of Entrepreneurship Lecturers and Administrators on the potentials of well-coordinated Public Private Partnership (PPP) for technology-driven teaching and learning of entrepreneurship studies.

The data for testing hypothesis two are presented in Table 4 below.

Variables	N	X	SD	DF	Std. Error	t-Cal	t- tab	p-value	Decision
Entrepr Lecturers	76	3.55	0.47						
				301	0.016	0.25	1.96	0.36	**NS**
Administrators	117	3.53	0.50						

Note: NS = Not Significant at 0.05.

Table 4: Test of significant difference in the mean ratings of Entrepreneurship Lecturers and Administrators on the potentials of Public Private Partnership (PPP) for technology-driven teaching and learning of entrepreneurship studies.

The data presented on t-test statistics in Table 4 showed that the t-calculated (t-cal) value of 0.36 is less than the t-table (t-tab) value of 1.95 at 192 degree of freedom. This indicates that there was no significant ($p<0.05$) difference in the mean ratings of the responses of Entrepreneurship Studies Lecturers and Administrators on the potentials of well-coordinated Public Private Partnership (PPP) for technology-driven teaching and learning of entrepreneurship studies in southeast Nigerian Universities. Consequently, the null hypothesis of no significant ($p<0.05$) difference in the mean ratings of the responses of the lecturers and administrators on hypothesis two is accepted.

Discussion of findings

The study identified Public Private Partnership approaches for technology-driven teaching and learning of entrepreneurship studies to include: Old Students Association of entrepreneurship studies graduates' involvement in the provision of modern instructional facilities, involvement of community-based professional associations in providing modern technologies for teaching entrepreneurship, finance of entrepreneurship studies programme by community-based philanthropists. Other identified approaches are: involvement of Nigerians in Diaspora in supplies of modern teaching facilities in entrepreneurship studies programme, non-governmental organizations (NGOs), corporations in financing technology-driven instruction in entrepreneurship, setting up Entrepreneurship Studies Trust Fund (ESTF) for improved financing of entrepreneurship studies programme.

Additional approaches also include: involvement of religious organizations in provision of ICT-facilities in entrepreneurship studies programmes, build operate and transfer (BOT), arrangement of ICT-based entrepreneurship laboratories between private and public institutions, facility operations, maintenance, and management arrangement between private and public institutions. The findings agreed with the reports of Umar and Babalola (2016), who identified common Public-Private-Partnership approaches as community-based philanthropists, community based professional workers association, parents' teachers' association, NGOs and international organizations, build operate and transfer (BOT) and facility operations, maintenance, and management private and public institutions arrangement among others. In addition, the findings of the study partly agreed with the report of Mobility Investment Priorities (2021), who found that build operate and transfer (BOT), facility operations, maintenance, and management and sale/leaseback are effective private and public arrangements.

The study identified potentials of well-coordinated Public Private Partnership for technology-driven teaching and learning of entrepreneurship studies to include: enhancement of entrepreneurship studies, improvement of efficiency in teaching and learning entrepreneurship studies, resources are more efficiently managed under public private partnership arrangement, stimulating entrepreneurial capacity of Nigerian graduates, sharing burdens between public and private sectors lessens the risks of both partners, PPP approach to technology driven instruction gives room for innovation in public education system, stimulates partnership between private and public actors in technology-driven curriculum development and implementation. It promotes funding of entrepreneurship studies by

private organizations and individuals. PPP helps boost welfare and motivational packages of human resources in public education sector and it enhances the absorption of entrepreneurship graduates for gainful employment on graduation. In agreement with the findings, Manuel (2012), affirmed that public private partnership approach when effectively coordinated has the capacity to prudently harness the needed expertise from pools of qualified labour and the prerequisite resources in both the public and private sectors. This finding conformed with that of Umar and Babalola (2016), who identified the benefits of private public partnership in education system to cover: employment of teachers and payment of their salaries, training and development of teachers, provision of infrastructural facilities, provision of quality assurance, provision of instructional materials, curriculum development and implementation, staff welfare and motivation and students' welfare and motivation. Osundina and Nwokocha (2015), submitted that engaging PPP model structure is effective in solving infrastructural problems that usually affect teaching and learning process in most universities in Nigeria.

Conclusion and recommendations

Public private partnership approach has proven to be effective in building strong and effective education system among other socioeconomic needs of the society. This study examined leveraging Public Private Partnership (PPP) approach for technology-driven teaching and learning of entrepreneurship in Southeast Nigerian Universities. From the data collected and analysed, the study identified 12 Public Private Partnership (PPP) approaches for technology-driven teaching and learning of entrepreneurship studies and 15 potentials of well-coordinated Public Private Partnership (PPP) for technology-driven teaching and learning of entrepreneurship studies in southeast Nigerian Universities. The results on the hypotheses tested showed that no significant ($p<0.05$) difference existed in the mean ratings of the responses of Entrepreneurship Studies Lecturers and Administrators. It is therefore concluded that adoption of well-structured public private partnership approach will help a great deal to actualize technology-driven instruction in the teaching and learning of entrepreneurship in south-eastern Universities and the country in general. Based on these findings, the study recommended:

1. Improved collaborations of public institutions with private investors for adequate funding and management of entrepreneurship programmes to actualize technology-driven instruction for quality education in Nigeria.

2. Better collaborations with foreign bodies and agencies for enhanced provision of required ICT facilities to promote technology-driven instruction in entrepreneurship centers in Nigerian tertiary institutions.

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STEPS TOWARDS CHANGE
DESIGNING PERSONALIZED MESSAGES BASED ON THE TRANSTHEORETICAL MODEL

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Abstract: *The Prochaska and DiClemente model, also known as the Transtheoretical Model (TTM), provides a comprehensive framework for understanding and facilitating behavior change. In this article, we explore the stages of change in the TTM and examine how they can be effectively applied to achieve lasting transformations. By analyzing the principles and strategies associated with each stage, individuals and professionals can gain insights into the process of change and develop tailored interventions that promote real, sustainable changes in various domains of life. In this article, we offer examples of how to communicate to individuals in each stage, depending on the area that change is expected in (e.g. climate change, addictions, positive new behaviors) and thus lay the framework for a more effective communication for change.*

Keywords: *Transtheoretical Model; stages of change; behavior change; sustainable transformation.*

Introduction

The Prochaska and DiClemente model, or the Transtheoretical Model, developed in the late 1980s, revolutionized the understanding of behavior change by introducing the concept of stages. In this article, we describe the stages of change in this model and explore their application to achieve real changes. By applying the principles of the Transtheoretical Model, individuals, researchers, and practitioners can develop effective strategies to facilitate behavior change across diverse contexts.

Individuals and organizations cannot change overnight, and that is the main idea behind the Transtheoretical Model, developed by researchers Prochaska and DiClemente (1983). The model states that, in order to be successful, a message or a campaign has to take into account the fact that there are many stages an individual goes through, before

actually changing. Initially, four stages were proposed by the two authors, in a 1982 article about smoking: (1) precontemplation; (2) contemplation; (3) action and (4) maintenance, and later on a fifth stage was added, between contemplation and action stages, and called *preparation* (Grimley, Prochaska, Velicer, Blais & DiClemente, 1994). Now, the model looks like this: (1) precontemplation; (2) contemplation; (3) preparation; (4) action and (5) maintenance. Sometimes, especially in health-related programs, a 6th stage might appear, called (6) termination or relapse, depending on the ending of the change process. In certain cases, *termination* means that the change is complete and the individual has successfully been through all the steps, or *relapse* when the individual slips from the process of change and has to go over through some of the steps.

1. Precontemplation Stage:
In the precontemplation stage, individuals are not planning to change their behavior in the near future. In fact, they are not even contemplating change (hence the name - precontemplation), because they do not see their behavior as being problematic. In this stage, individuals are usually uninformed about their behaviors and the long-term consequences that might occur, lack the belief that they could change anything, avoid thinking about the problem and are generally in defense about the social pressures for change. In an article about smoking cessation, researchers Prochaska, Velicer, Guadagnoli, Rossi & DiClemente (1991), found that two thirds of the 200 smokers investigated in the study remained in the precontemplation stage even two years later, thus proving that this stage is one of the most stable and difficult to overcome. A period of six months is usually used for this stage, as it is considered that individuals don't go further than six months when considering changes.

Characteristics and Mindset:

- Lack of awareness or denial of the need for change.
- Minimal intention to take action.
- May exhibit defensiveness when confronted with the need for change.
- May rationalize or justify their behavior.

Advantages:

- Provides a sense of stability and familiarity with the current behavior.

- May serve as a protective mechanism against immediate distress or discomfort.

Disadvantages:
- Lack of readiness for change can hinder progress.
- May lead to missed opportunities for personal growth and improvement.
- Maintaining unhealthy behaviors can lead to negative consequences in the long run.

2. Contemplation Stage:
Contemplation is the second stage in the model, where individuals are aware that a problem exists and have serious intentions to change that within the next six months. This stage can also be very static, as individuals have not committed to make any change and thus can be stuck in this loop for a very long time. In the previously mentioned study about smokers, the authors (DiClemente & Prochaska, 1982; Prochaska & Di Clemente, 1984) found that individuals remained in this stage for almost 2 years, without making any significant action to change that. In this stage, people know their direction and where they want to get with the change, but are not ready yet to implement it.

Characteristics and Mindset:
- Ambivalence towards change.
- Recognizes the need for change but feels uncertain about taking action.
- Weighs the benefits and drawbacks of change.
- May seek information and explore different options.

Advantages:
- Increasing awareness of the need for change.
- Openness to gathering information and considering alternatives.
- The contemplation stage can serve as a bridge between precontemplation and preparation stages.

Disadvantages:
- Tendency to remain in a state of indecisiveness or inaction.
- May become overwhelmed by the perceived challenges and uncertainties of change.

- Procrastination or delay in taking the necessary steps towards change.

3. Preparation Stage:
Preparation is the stage where individuals *prepare* to take action in the very near future (usually within the next month), they have designed an action plan and have tried several small behavioral changes (e.g. reducing the alcohol quantity, in case of alcohol consumption). This stage is more of a transitional one, as individuals will make progress in the foreseeable future (within the next month).

Characteristics and Mindset:
- Intention to take action in the near future.
- May set specific goals and establish a timeline.
- Starts seeking resources and support to facilitate change.
- May experiment with small changes or preliminary actions.

Advantages:
- Increased commitment and motivation to change.
- Active preparation and planning for change.
- Engagement in actions that support the desired transformation.

Disadvantages:
- The preparation stage can be prolonged, leading to a delay in actual behavior change.
- The risk of becoming stuck in the planning phase without progressing to the action stage.
- Unrealistic goal-setting or inadequate preparation, which can undermine successful change.

4. Action Stage:
Action is the fourth stage in the model and is represented by clear behavioral changes. For example, with smokers, they are not considered to be in the action stage if they only reduced their number of cigarettes per day. Instead, they must have quit smoking within the last six months. Of all the stages in the model, this one is the least stable, because there are a lot of behavioral changes to maintain and the risk of relapses are often at the highest levels.

Characteristics and Mindset:
- Visible behavioral changes in pursuit of the desired goal.

- Requires a conscious effort to overcome obstacles and sustain new behaviors.
- May experience both successes and setbacks along the way.
- Active engagement in strategies and techniques to support behavior change.

Advantages:

- Concrete progress towards the desired change.
- Enhanced confidence and self-efficacy through successful modification of behavior.
- Opportunities for learning and growth through experiences and feedback.

Disadvantages:

- The action stage can be demanding, requiring sustained effort and willpower.
- The risk of relapse or reverting to old behaviors due to challenges or triggers.
- The need for ongoing support and self-motivation to maintain new behaviors.

5. Maintenance Stage:

Maintenance is the fifth stage and ranges from a period of six months when the action phase has been reached, until the problematic behavior is terminated. In this stage, individuals don't just resist temptation and refrain from engaging in the problematic behaviors, instead they use a vast array of tools (e.g. behavioral skills) needed to avoid relapses.

Characteristics and Mindset:

- Consistent practice of new behaviors or habits.
- Integration of the desired change into daily life.
- Developing strategies to cope with challenges and prevent relapse.
- Building resilience and self-efficacy in maintaining the change.

Advantages:

- Consolidation of the desired behavior change.
- Increased self-confidence and self-control.

- Reduced risk of relapse and long-term adherence to the new behaviors.

Disadvantages:

- Complacency or a false sense of security, leading to a decline in vigilance.
- The risk of environmental or internal triggers that may challenge the maintenance of new behaviors.
- The need for ongoing effort and commitment to sustain the change in the long run.

6. Termination Stage:

After these five stages which belong to the acquisition of behaviors, there can also be a final stage, either in the form of *termination* or *relapse.* The termination stage is a period of time when the problematic behavior has been extinct. This stage is characterized by two criteria: (1) there is no temptation to engage in a previous problematic behavior and (2) the individual is 100% confident that he/she will not engage in the problematic behavior again. Regarding smoking, research (Prochaska & DiClemente, 1984) shows that the highest levels of confidence appear after 1 year and a half of abstinence, yet temptation appears only after 3-4 years of abstinence, making things tricky for former smokers to resist. Even after one year of continuous abstinence there is still a third of individuals who will return to smoking, and this percentage drops to 7% after 5 years of continuous abstinence (USDHHS, 1990).

Characteristics and Mindset:

- Complete internalization of the desired change.
- Absence of temptation or desire to return to the previous behavior.
- High self-efficacy and confidence in maintaining the change.

Advantages:

- Successful achievement of sustainable behavior change.
- Greater overall well-being and improved quality of life.
- The transformed behavior becomes automatic and requires minimal effort.

Disadvantages:

- The termination stage is not always applicable to all behaviors or individuals.
- Overconfidence in maintaining the change, which may lead to complacency.
- The potential for unexpected life events or circumstances that may challenge the maintenance of the change.

The progress through these stages is not always linear, but rather cyclical, and individuals who relapse don't always go back to the first stage.
The Transtheoretical model offers a valuable framework for understanding the process of behavior change and achieving sustainable transformations. By recognizing the distinct stages individuals pass through during their change journey, interventions and strategies can be tailored to meet their unique needs and circumstances. However, it is important to consider the challenges and limitations associated with each stage and implement approaches that promote long-term maintenance and prevent relapse. With a comprehensive understanding of the stages of change, individuals, professionals, and policymakers can foster real changes in various domains of life and contribute to the betterment of society as a whole.

Applying the Model
The Transtheoretical Model (TTM), can be applied to various areas where behavior change is desired. Some of the areas where this model has been used include:

1. Health and Wellness:
The TTM has been extensively used in promoting health behavior changes such as smoking cessation (Prochaska, Velicer, Guadagnoli, Rossi & DiClemente, 1991), weight management (de Freitas et al., 2020), physical activity (Marcus, Rossi, Selby & Niaura, 1992; Han, Pettee & Kohl, 2017), sunscreen use (Rossi, 1992), medication adherence (Imeri, Toth, Arnold & Barnard, 2022), dietary modifications (Rossi, Rossi, Velicer & Prochaska, 1990), nursing care (Lee, Park & Min, 2015), condom and contraceptive use (Grimley, Riley, Bellis & Prochaska, 1992), medical screenings (Rakowski, Dube, Marcus, Prochaska & Velicer, 1992) or diabetes control (Andrés, A., Gómez, J., & Saldana, C. (2008). It provides a framework for understanding individuals' readiness to change and tailoring interventions accordingly.

2. Addiction and Substance Abuse:
The model is highly relevant in the context of addiction (Sutton, 2001) and substance abuse, such as alcohol abuse (Prochaska et al., 2004), drug abuse (Evers et al., 2012). It helps professionals assess an individual's stage of change, develop personalized treatment plans, and address relapse prevention strategies.

3. Mental Health:
The TTM can be applied to promote behavior change in mental health (Lach, Everard, Highstein & Brownson, 2004) domains such as stress management (Evers et al., 2006), coping skills, adherence to treatment plans Guillot, Kilpatrick, Hebert, Hollander, 2004), and seeking help for mental health concerns such as depression (Levit, Cismaru & Zederayko, 2015). It offers insights into individuals' readiness to engage in therapeutic interventions and supports treatment planning.

4. Education and Learning:
In educational settings, the TTM can be used to understand and facilitate behavior change related to study habits (Grant & Franklin, 2007), time management (O'Brien, 2000), goal setting, and academic performance (Moreira et al., 2020). It helps educators develop interventions that cater to students' specific needs and readiness for change.

5. Workplace and Organizational Change:
The TTM can be employed in facilitating behavior change within organizations (Prochaska, 2000), such as promoting a healthy work-life balance (Geithner, Albert & Vincent, 2007), enhancing productivity (Finnegan et al., 2018), fostering teamwork, and implementing organizational changes. It assists in identifying employees' readiness for change and designing interventions accordingly.

6. Environmental Sustainability:
Behavior change plays a crucial role in promoting sustainable practices and mitigating environmental challenges. The TTM can be utilized to encourage individuals to adopt environmentally friendly behaviors (Saulick, Bekaroo, Bokhoree & Beeharry, 2023), such as recycling, energy conservation, and sustainable transportation choices.

7. Social and Community Initiatives:
The TTM can be applied in community-based interventions aimed at addressing various social issues. It can guide programs targeting areas such as smoking prevention, violence reduction (Anderson, 2003),

community engagement (Finnegan et al., 2018), and promoting social responsibility (Simpkins, 2015).

Advertising and Campaign Messages for Change

This article is not an endeavor to list the clinical and behavioral strategies to be applied in the change process. Instead, it is a short guide on how to communicate with individuals (or companies) regarding change, for each of the five stages and in various fields (e.g. to achieve positive and desirable behaviors or to quit negative, undesirable ones). Next, we present some messages that can be used to communicate for change, for each of the five stages in the Transtheoretical model and depending on the topic. We have chosen 13 areas of communication for change that we considered to be most relevant and presented them in their alphabetical order. We acknowledge that there could be other important areas as well, and we will consider them in future research.

I. Messages for promoting alcohol cessation

1. Precontemplation stage (Not yet considering change):
Message: "Explore Life's Possibilities Without Alcohol!"

- "Take a moment to reflect on your relationship with alcohol. Even if you're not ready to quit yet, it's important to consider the impact it may have on your health and well-being."
- "Explore the reasons behind your drinking habits. Understanding the potential risks and benefits can motivate you to take the next step when you're ready."

In this stage, individuals may not recognize or acknowledge any negative consequences associated with their drinking behavior. Focus on raising awareness about the benefits of a sober lifestyle and the potential for positive experiences, such as increased health, clearer thinking, and more meaningful connections with others.

2. Contemplation stage (Considering change but undecided):
Message: "Question Your Relationship with Alcohol – It's Your Choice!"

- "You're considering making a change, and that's a significant step. Take the time to weigh the pros and cons of reducing or quitting alcohol. Visualize the positive outcomes and envision a healthier, more fulfilling life."

- "Talk to others who have successfully reduced or quit drinking. Learn from their experiences and gather insights that can help you make an informed decision."

Individuals in the contemplation stage are aware of the potential negative effects of drinking but may still feel uncertain about change. Encourage self-reflection and critical thinking by presenting thought-provoking questions about the impact of alcohol on various aspects of their lives. Highlight the importance of personal agency and emphasize that the decision to change ultimately lies with them.

3. Preparation stage (Preparing for change):
Message: "Empower Yourself: Take the First Step to a Healthier You!"

- "Congratulations on deciding to take action! Set a specific date to start your alcohol cessation journey. Use this time to gather resources, build a support network, and develop strategies to cope with potential challenges."
- "Identify your triggers and develop alternative activities or coping mechanisms to replace alcohol. Surround yourself with supportive friends or family members who can help you stay committed to your goals."

Individuals in the preparation stage are ready to take action and make a change. Provide practical information and resources to support their decision, such as tips for finding alternative activities, seeking social support, and setting achievable goals. Emphasize that they are not alone in their journey and that assistance is available.

4. Action stage (Initiating change):
Message: "Embrace the Freedom of a Drink-Free Lifestyle!"

- "You're actively working towards reducing or quitting alcohol. Stay focused on your motivations and celebrate each milestone along the way."
- "Seek professional assistance if needed. Consider joining support groups or engaging in therapy to enhance your chances of success. Remember, you're not alone in this journey."

Individuals in the action stage have already taken significant steps to modify their drinking behavior. Focus on reinforcing their commitment and motivation by highlighting the positive changes they are experiencing. Share success stories, tips for overcoming challenges, and strategies for maintaining a healthy and fulfilling life without alcohol.

5. Maintenance stage (Sustaining change):
Message: "Celebrate Your Progress: A Lifetime of Health and Happiness Awaits!"

- "You've successfully reduced or quit alcohol, but the journey doesn't end here. Stay vigilant and continue practicing healthy habits. Remind yourself of the progress you've made and the reasons why you chose to change."
- "Share your success story with others who may be struggling with alcohol. Your experience can inspire and motivate them to pursue their own journey of change."

Individuals in the maintenance stage have successfully modified their behavior and are striving to maintain long-term change. Reinforce their achievements and remind them of the ongoing benefits of a sober lifestyle. Provide encouragement, ongoing support resources, and reminders of the progress they have made to help them stay motivated and committed.

II. Messages for stopping bullying

1. Precontemplation:

- "Bullying affects more than just the victim. Take a moment to reflect on the impact your actions may have on others. Together, we can build a kinder and more inclusive community."
- "Reflect on the impact of bullying on others and yourself. Even if you haven't considered changing your behavior yet, it's important to acknowledge the harm it causes and the potential for personal growth."
- "Learn about the consequences of bullying for both the victim and the perpetrator. Understanding the negative effects can help you develop empathy and perspective."

2. Contemplation:

- "Are you tired of seeing bullying around you? It's time to consider taking a stand. Reflect on the power of empathy and compassion. Join us in creating a safe and respectful environment for everyone."
- "You're considering making a change in your behavior towards bullying. Take the time to evaluate your actions and the reasons

behind them. Imagine a world without bullying and envision the positive impact you can have."

- "Engage in open conversations with friends, family, or professionals who can provide guidance and support. Discuss your concerns, doubts, and aspirations related to stopping bullying."

3. Preparation:
   - "You've recognized the need for change. Equip yourself with knowledge and strategies to prevent bullying. Start by learning effective communication skills and conflict resolution techniques. Together, we can stop bullying in its tracks."
   - "Congratulations on deciding to take action! Set a clear intention to stop bullying and make a commitment to change. Identify the specific behaviors you want to address and develop strategies to handle challenging situations."
   - "Educate yourself about alternative ways to communicate and resolve conflicts. Practice empathy, active listening, and assertiveness skills. These tools can help you build healthier relationships and prevent bullying."

4. Action:
   - "Take action against bullying today! Speak up when you witness it, support victims, and encourage empathy. Together, we can create a culture where bullying is not tolerated. Your voice matters!"
   - "You're actively working towards stopping bullying. Practice self-awareness and monitor your behavior closely. Recognize when you're tempted to engage in bullying and consciously choose alternative responses."
   - "Seek guidance from mentors, counselors, or anti-bullying programs. They can provide valuable support, teach conflict resolution skills, and help you navigate challenging social dynamics."

5. Maintenance:
   - "Congratulations on making a difference! Staying vigilant is key to maintaining positive change. Keep educating and

inspiring others to stand up against bullying. Together, we can build a lasting legacy of kindness and respect."

- "Congratulations on making progress in stopping bullying! Remember, this is an ongoing commitment. Stay vigilant and continue practicing empathy, respect, and kindness in all your interactions."
- "Lead by example and encourage others to join you in promoting a bully-free environment. Spread awareness about the impacts of bullying and advocate for positive change in your community."

III. Messages for promoting child adoption

1. Precontemplation Stage (Not considering adoption):
   - "Discover the joy of parenthood and make a lasting impact on a child's life through adoption."
   - "Learn about the rewards of adoption and how it can bring love and fulfillment to your family."
   - "Explore the possibilities of expanding your family through adoption and provide a loving home for a child in need."

2. Contemplation Stage (Considering adoption):
   - "Imagine the incredible bond you can create through adoption. Take the first step towards building a loving family."
   - "Reflect on the joy of giving a child a forever home. Consider adoption as a path to parenthood."
   - "Explore the world of adoption and gather information to make an informed decision. Begin your journey towards becoming an adoptive parent."

3. Preparation Stage (Preparing for adoption):
   - "Get ready to welcome a child into your home. Learn about the adoption process and prepare yourself for the journey ahead."
   - "Take practical steps towards adoption. Attend informational sessions, connect with adoption agencies, and start laying the groundwork for a loving family."
   - "Prepare your heart and home for a child. Create a safe and nurturing environment that will give an adopted child the love they deserve."

4. Action Stage (Actively pursuing adoption):
   - "Take the leap and start the adoption process today. Begin the fulfilling journey of becoming a parent through adoption."
   - "Navigate the adoption process with confidence. Our experienced team is here to support you every step of the way."
   - "Start connecting with adoption professionals, attend parenting workshops, and complete the necessary paperwork. Your dream of adopting a child is within reach."

5. Maintenance Stage (Successfully adopted):
   - "Celebrate the joy of adoption and the incredible bond you've formed with your child. Embrace the adventure of parenthood."
   - "Share your adoption story and inspire others to consider adoption. Help create a world where every child has a loving home."
   - "Continue to nurture your family and provide a loving environment for your adopted child to thrive. Be a role model for other families considering adoption."

IV. Messages for promoting climate change awareness

1. Precontemplation Stage (Unawareness):
   - "Discover the impact of climate change on our planet and learn how small changes can make a big difference."
   - "Uncover the hidden consequences of our actions on the environment and join the conversation on climate change."

2. Contemplation Stage (Awareness):
   - "Recognize the urgency of climate change and explore how your choices can contribute to a sustainable future."
   - "Consider the environmental challenges we face and envision a greener tomorrow. Together, we can create change."

3. Preparation Stage (Motivation):
   - "Take the first step towards a sustainable lifestyle. Join us in adopting eco-friendly habits for a brighter future."
   - "Get ready to make a positive impact. Learn practical ways to reduce your carbon footprint and inspire others to do the same."

4. Action Stage (Implementation):
   - "Become an environmental champion by incorporating renewable energy, recycling, and conservation practices into your daily life."
   - "Lead the way in combating climate change through tangible actions. Together, we can build a greener and cleaner world."

5. Maintenance Stage (Sustainability):
   - "Celebrate your commitment to a sustainable lifestyle. Share your success stories and inspire others to follow in your footsteps."
   - "Keep the momentum going! Stay dedicated to sustainable choices and encourage others to join the movement for a thriving planet."

V. Messages for promoting daily exercising

1. Precontemplation Stage (Not considering exercise):
   - "Discover the benefits of daily exercise – a step towards a healthier you!"
   - "Unleash your potential with daily exercise – it's never too late to start!"
   - "Explore the joy of an active lifestyle – exercise your way to a happier, fitter you!"

2. Contemplation Stage (Considering exercise):
   - "Imagine a healthier future – take the first step towards daily exercise today!"
   - "Unlock your motivation – daily exercise can transform your life!"
   - "Ponder the possibilities – commit to daily exercise and embrace a better you!"

3. Preparation Stage (Preparing for exercise):
   - "Gear up for success – get ready to incorporate daily exercise into your routine!"
   - "Plan your fitness journey – start small and work your way up to daily exercise!"
   - "Equip yourself for a healthier lifestyle – set achievable goals for daily exercise!"

4. Action Stage (Engaging in exercise):
   - "Embrace the power of daily exercise – feel the energy and vitality it brings!"
   - "Make every day count – commit to daily exercise and see amazing results!"
   - "Celebrate your progress – you're on track with daily exercise, keep pushing!"

5. Maintenance Stage (Sustaining exercise):
   - "Daily exercise is your way of life – continue to prioritize your health and well-being!"
   - "You're an exercise champion – maintain your momentum with daily exercise!"
   - "Stay motivated, stay active – daily exercise ensures a lifetime of wellness!"

VI. Messages for promoting a healthier lifestyle

1. Precontemplation Stage (Not yet considering change):
   - "Discover the power of a healthier lifestyle and its positive impact on your well-being."
   - "Uncover the benefits of embracing a healthier life and take control of your future."
   - "Learn how small changes can lead to a happier, healthier you."

2. Contemplation Stage (Considering change):
   - "Imagine a healthier life: one step closer to achieving your goals."
   - "Ponder the possibilities of a healthier lifestyle and the positive transformations it can bring."
   - "Reflect on the potential of a healthier you and the improved quality of life that awaits."

3. Preparation Stage (Planning for change):
   - "Get ready to embark on a journey towards a healthier lifestyle. Start planning today!"
   - "Equip yourself with the tools and knowledge needed to make lasting changes for a healthier you."

- "Preparation is key: lay the foundation for success on your path to a healthier tomorrow."

4. Action Stage (Taking steps towards change):
   - "Take charge of your health today! Implement small changes and witness big results."
   - "It's time to make a move! Embrace healthier habits and experience a positive transformation."
   - "Commit to action! Start exercising, eating well, and nurturing yourself for a healthier, happier life."

5. Maintenance Stage (Sustaining the change):
   - "Congratulations on your progress! Maintain your healthier lifestyle and enjoy the long-term benefits."
   - "You've come a long way! Keep up the good work and enjoy the rewards of a sustainable, healthy lifestyle."
   - "Stay motivated, stay healthy! Embrace the joy of maintaining your positive lifestyle changes."

VII. Messages for promoting mental health awareness

Stage 1: Precontemplation (Not ready for change):
- "Understanding mental health is the first step towards a healthier you. Explore the resources available to learn more."
- "Don't suffer in silence. Let's start a conversation about mental health and find support together."
- "Take a moment to consider the importance of mental well-being. Your journey starts with self-reflection."

Stage 2: Contemplation (Considering change):
- "Change begins with self-reflection. Explore your feelings and thoughts about mental health today."
- "You're not alone in your contemplation. Discover stories of others who have transformed their lives through mental health acceptance."
- "Contemplating change is the first step towards a brighter future. Learn about the benefits of embracing mental health."

Stage 3: Preparation (Getting ready for change):

- "Equip yourself with knowledge and resources to embrace mental health positively. Prepare for a transformative journey."
- "Take charge of your mental well-being. Start planning small steps towards self-care and acceptance."
- "Preparing for change? Seek out a support network and empower yourself with tools to foster mental health."

Stage 4: Action (Initiating change):

- "It's time to take action! Engage in self-care practices and reach out to professionals or support networks for guidance."
- "Every small step counts. Embrace mental health by adopting healthy habits and engaging in activities that promote well-being."
- "You're on your way to a healthier mind. Stay committed to self-care and inspire others to take action too."

Stage 5: Maintenance (Sustaining change):

- "Celebrate your progress! Maintain your mental well-being through continued self-care practices and ongoing support."
- "Consistency is key. Stay connected with your support system and enjoy the benefits of a healthier mindset."
- "You've come a long way, and your journey isn't over. Continue prioritizing mental health and inspire others to do the same."

VIII. Messages for promoting the adoption of a pet

1. Precontemplation Stage (Unaware or Uninterested):

- "Discover the joy of pet companionship! Learn about the benefits of adopting a furry friend."
- "Find out how adopting a pet can bring happiness and love into your life."
- "Explore the world of pet adoption and see how it can transform your daily routine."

2. Contemplation Stage (Considering Change):

- "Thinking about adopting a pet? We're here to answer your questions and provide guidance."
- "Imagine the bond you can create with a loyal pet. Consider the possibilities of adoption."

- "Explore the different types of pets available for adoption and see if one resonates with you."

3. Preparation Stage (Getting Ready for Change):
- "Ready to take the next step? Discover our adoption process and get prepared."
- "Plan for your new family member. Learn about pet care, supplies, and creating a safe environment."
- "Get your home pet-ready! Find out how to ensure a smooth transition for your adopted pet."

4. Action Stage (Taking the Plunge):
- "Adopt your new best friend today! Explore our selection of adorable pets waiting for a forever home."
- "Visit our adoption center and meet your perfect match. Start the amazing journey of pet companionship!"
- "Congratulations on adopting a pet! Discover helpful resources and tips for a successful integration."

5. Maintenance Stage (Sustaining the Change):
- "Celebrate your pet adoption anniversary! Share your story and inspire others to follow in your footsteps."
- "Enjoy the rewards of pet ownership. Explore ongoing education, health care, and training options."
- "You've made a lifelong commitment. Discover how to keep the bond alive and provide the best care for your pet."

IX. Messages for promoting reading

1. Precontemplation Stage (Not considering reading as a regular activity):
- "Discover the magic of reading! Start exploring new worlds and expanding your horizons today."
- "Unleash the power of reading! It's never too late to embark on a journey through the pages of a great book."
- "Imagine the joy, knowledge, and inspiration waiting for you in books. Let's open a new chapter in your life!"

2. Contemplation Stage (Considering the benefits of reading but hesitant):

- "Curiosity sparked. Adventure awaits. Dip your toes into the world of reading and unlock countless possibilities."
- "Pondering the rewards of reading? Take a leap of faith and let books captivate your imagination and enrich your mind."
- "Contemplating the joy of reading? Join a community of book lovers and experience the transformative power of words."

3. Preparation Stage (Getting ready to incorporate reading into daily life):

- "Prepare to ignite your passion for reading! Gather your favorite books, find a cozy spot, and get ready for an adventure like no other."
- "Equip yourself for a reading revolution! Create a reading nook, compile a reading list, and set the stage for a lifelong love affair with books."
- "Preparation is key! Set aside dedicated reading time, gather recommendations, and embrace the wonderful habit of reading."

4. Action Stage (Actively engaging in reading):

- "Congratulations on taking action! Dive into the pages of captivating stories, gain knowledge, and experience the transformative joy of reading."
- "Unlock the power of imagination through action! Immerse yourself in fascinating narratives and let reading shape your perspective on life."
- "You're on a roll! Keep the reading momentum going. Discover new authors, genres, and ideas. Your reading adventure awaits!"

5. Maintenance Stage (Sustaining reading as a regular habit):

- "Maintain the magic of reading! Continue to explore new genres, share book recommendations, and inspire others to embark on their reading journey."
- "You've made reading an integral part of your life. Keep the flame alive! Discover hidden gems, join book clubs, and experience the lifelong rewards of reading."

- "Congratulations on maintaining a love for reading! It's a lifelong gift. Keep expanding your literary repertoire and inspire others to join the reading revolution."

X. Messages for promoting smoking cessation

1. Precontemplation Stage (Not ready to quit):
   - "Learn the facts: Smoking increases your risk of heart disease, cancer, and respiratory problems. Start gathering information to make an informed decision."
   - "Reflect on your values: Imagine a future where you are free from addiction, enjoying a healthier, smoke-free life."

2. Contemplation Stage (Considering quitting):
   - "Picture a smoke-free you: Visualize the benefits of quitting smoking - improved health, increased energy, and a longer life."
   - "Explore your motivations: Identify the reasons why quitting smoking is important to you, your loved ones, and your overall well-being."

3. Preparation Stage (Getting ready to quit):
   - "Set a quit date: Choose a specific date to start your smoke-free journey and mark it on your calendar. It's a significant step towards a healthier lifestyle."
   - "Build a support network: Inform your family and friends about your decision to quit smoking. Seek their encouragement and assistance during challenging times."

4. Action Stage (Quitting smoking):
   - "Take it one step at a time: Break your smoking habit into manageable chunks. Celebrate each small victory along the way as you stay committed to your smoke-free goal."
   - "Find healthy alternatives: Replace smoking with positive activities such as exercise, hobbies, or spending time with loved ones. Discover new ways to cope with stress."

5. Maintenance Stage (Maintaining a smoke-free life):

- "Celebrate milestones: Acknowledge your progress and reward yourself for staying smoke-free. Treat yourself to something special as a reminder of your achievement."
- "Guard against relapse: Stay vigilant and recognize potential triggers. Build a strong support system that will help you stay on track and overcome any challenges."

XI. Messages for promoting sustainability

1. Precontemplation Stage (Not yet considering change):
   - "Discover the power of sustainability and its positive impact on your world."
   - "Uncover the hidden benefits of sustainable living for a brighter future."
   - "Explore how small changes can make a big difference for a sustainable planet."

2. Contemplation Stage (Thinking about change):
   - "Imagine a sustainable future where your actions contribute to a thriving planet."
   - "Reflect on the benefits of sustainable choices and consider taking the first step."
   - "Picture a world where every decision you make aligns with a sustainable lifestyle."

3. Preparation Stage (Preparing for change):
   - "Equip yourself with practical tools and resources to kick-start your sustainable journey."
   - "Plan for a sustainable lifestyle by setting achievable goals and creating a roadmap."
   - "Get ready to make a positive impact on the environment with simple, actionable steps."

4. Action Stage (Taking steps towards change):
   - "Join the movement and become an agent of change for a sustainable planet."
   - "Implement sustainable practices in your daily life and inspire others to follow suit."
   - "Take action now to create a greener, healthier future for generations to come."

5. Maintenance Stage (Sustaining the change):
   - "Celebrate your sustainable achievements and inspire others with your success story."
   - "Continue to nurture your sustainable habits and enjoy the long-term benefits."
   - "Embrace a lifestyle that harmonizes with nature and cultivates a sustainable legacy."

XII. Messages for promoting a vegetarian consumption

1. Precontemplation Stage (Not considering change):
   - "Discover the benefits of a vegetarian/vegan lifestyle and how it can positively impact your health and the environment."
   - "Learn about the ethical reasons behind choosing a vegetarian/vegan lifestyle and its impact on animal welfare."
   - "Explore delicious plant-based recipes that can open up a whole new world of flavors and culinary experiences."

2. Contemplation Stage (Considering change):
   - "Reflect on the reasons why you are considering a vegetarian/vegan lifestyle and how it aligns with your personal values and beliefs."
   - "Find support and join a community of like-minded individuals who can share their experiences and provide guidance on transitioning to a vegetarian/vegan lifestyle."
   - "Take small steps towards vegetarianism/veganism, such as participating in meatless Mondays or experimenting with plant-based meals."

3. Preparation Stage (Preparing for change):
   - "Develop a meal plan and gather resources to ensure a balanced and nutritious vegetarian/vegan diet."
   - "Educate yourself about alternative protein sources to meet your nutritional needs and fuel your body in a sustainable way."
   - "Start exploring vegetarian/vegan-friendly restaurants, food products, and cooking techniques to make your transition smoother and more enjoyable."

4. Action Stage (Making the change):

- "Embrace the vegetarian/vegan lifestyle and experience the positive changes in your health, energy levels, and overall well-being."
- "Share your journey with others and inspire them to join you in adopting a more compassionate and sustainable way of living."
- "Celebrate your progress and achievements as you explore new flavors, support ethical practices, and reduce your environmental footprint."

5. Maintenance Stage (Sustaining the change):
   - "Continuously educate yourself about the latest developments in vegetarian/vegan nutrition and culinary trends to keep your diet varied and exciting."
   - "Become an advocate for vegetarianism/veganism by sharing your knowledge, experiences, and recipes with friends, family, and your community."
   - "Celebrate the positive impact you are making on your health, animal welfare, and the environment, and inspire others to join you on this journey."

XIII. Messages for promoting selective waste collection

Stage 1: Precontemplation (Unaware of the issue)

- "Discover the power of selective waste collection and its positive impact on the environment!"
- "Did you know that small changes in waste disposal can make a big difference? Learn more about selective waste collection today!"
- "Join us in raising awareness about the importance of selective waste collection. Together, we can make our planet greener!"

Stage 2: Contemplation (Considering change)

- "Are you ready to make a positive change? Explore the benefits of selective waste collection and take the first step towards a cleaner future!"
- "Imagine a world with less waste and a healthier environment. Start considering selective waste collection today and be part of the solution!"

- "Pondering over waste reduction? Discover the advantages of selective waste collection and how it contributes to a sustainable future."

Stage 3: Preparation (Preparing for change)

- "Ready to take action? Equip yourself with the knowledge and tools for successful selective waste collection. Get ready to make a difference!"
- "Plan your waste reduction strategy with selective collection methods. Prepare yourself and your community for a sustainable tomorrow!"
- "Take the next step and get ready to implement selective waste collection. Find out how to set up your collection system effectively!"

Stage 4: Action (Implementing change)

- "Congratulations on taking the leap! Start sorting your waste today and experience the positive impact of selective collection on our environment!"
- "You're making a difference! Embrace the habit of selective waste collection and inspire others to follow suit. Together, we create a greener world!"
- "You've joined the movement! Keep up the great work and continue to champion selective waste collection. Your actions matter!"

Stage 5: Maintenance (Sustaining change)

- "You're a waste reduction champion! Maintain your selective waste collection habits and motivate others to do the same. Together, we can achieve a long-lasting impact!"
- "Consistency is key! Keep up the good work with selective waste collection and inspire those around you to adopt sustainable practices. Our planet thanks you!"
- "You've made selective waste collection a way of life. Share your success story and encourage others to stay committed. The environment thrives with your ongoing efforts!"

Conclusions

To effectively implement personalized messages within the TTM framework, several considerations should be taken into account. Firstly, an initial assessment of an individual's or targeted group's stage of change is necessary to tailor the messages appropriately. This assessment can be conducted through self-report measures or in collaboration with healthcare professionals and specialists in various areas (advertising, marketing communication). Secondly, the messages should be designed to align with the individual's specific needs, motivations, and barriers. This requires a comprehensive understanding of the target behavior and the factors influencing behavior change. Thirdly, the messages should be delivered through suitable channels, such as face-to-face interactions, written materials, mobile applications, or online platforms. Utilizing technology, such as mobile apps or social media platforms, can enhance the accessibility and effectiveness of personalized messages. Lastly, regular follow-up and feedback are essential to track progress, provide ongoing support, and reinforce positive behavior changes.

The Transtheoretical Model (TTM) provides a valuable framework for facilitating positive behavior change and overcoming dysfunctional behaviors across various areas. Personalized messages play a crucial role in tailoring interventions within the TTM framework and have shown promising results in promoting behavior change. By incorporating personalized messages into behavior change interventions, individuals can receive targeted support that addresses their unique needs, motivations, and barriers. Moving forward, further research and practical implementation of personalized messages within the TTM framework can contribute to more effective behavior change interventions and ultimately improve individuals' health and well-being.

In this brief article, we have designed messages for change for 13 different areas (alcohol cessation, stopping bullying, promoting child adoption, raising awareness for climate change, promoting daily exercising, a healthy lifestyle, raising awareness about mental health issues, promoting pet adoption, promoting reading, smoking cessation, sustainability awareness, vegetarian lifestyle and waste collection). We have done this within the Transtheoretical Model approach, considering that individuals and groups can be in different stages of (mental and behavioral) change and thus communication should be different, according to the state they are in. Organizations that work in the field of behavioral and attitude change can use the information in this article to start designing their communication accordingly and better understand that messages have to be personalized according to

(1) the characteristics of the targeted groups (the avatars), (2) the stage they are in (described in the Transtheoretical Model) and (3) other factors (socio-demographic or cultural ones).

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INCORPORATION OF ICT INTO EDUCATION: THE REQUIREMENT FOR EMERGING NATIONS TO COORDINATE ICT IN THE EDUCATING AND LEARNING OF MATHEMATICS SUCCESSFULLY

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Abstract: *The world is growing technologically in various circles of life; education is not left out. Countries are attempting to get together with this turn of events. In the education sector, many information communication technology devices have been invented to supplement the normal customary technique for education. Numerous soft wares can be applied in educating/learning. These ICT tools are utilized in the instructing and studying of mathematics that make it clearer and more practical for students to comprehend the concepts of mathematics. Regardless the benefits of technology to the teaching of mathematics, a few nations are yet to incorporate it in their schools most particularly the developing nations. Many developed nations have incorporated the ICT into their schooling however the vast majority of the developing nations are as yet lingering behind; it might be because of their administration's disregard for the significance of the ICT use. The study reviews some related literature on ICT use. The study looks at the meaning of ICT, ICT use and mathematics learning, ICT use and developing countries' institutions, and the benefit of ICT usage and students' performance in mathematics.*

Keywords: *ICT; education, mathematics.*

Introduction

Many developing countries, for example, Nigeria is been impacted by science and Technology. It is vital for the total acknowledgement of science and technology nations' fast development, be it economical or technological. The numerous issues educators experience in mathematics teaching and learning today at all levels of education should be completely handled; if not, the acknowledgement of this

technology will be a futile exercise. One method to realize this science and technology is to improve mathematics teaching and learning in our different schools, most particularly at the elementary and secondary schools' levels.

According to Batiku (2002) cited in Bature (2016), mathematics is a significant subject or tool required in this current technology development era. Babalola (1991) cited in Bature (2016) consider mathematics as the fundamental and central instrument in gaining scientific and technological knowledge, and sound basic and scientific thinking for our day to day existence or living. Anibueze (2015) believed that mathematics assumes crucial parts in acquiring technological and scientific knowledge. The utilization of ICT is vital in mathematics; along these lines there is a need to further develop mathematics teaching in our schools for successful teaching and study of the subject and advancement of our country.

One of the core subjects offered at the elementary level of every nation's educational system is Mathematics. It is made compulsory as a result of its usefulness to our everyday living. In nation such as Nigeria, mathematics is compulsory at the elementary, secondary levels and a prerequisite to university education. Due to its essential nature, the government is trying to ensure high-quality mathematics education. The administration has made different attempts previously to ensure mathematics achievement in schools is improved. Despite the effort of the government, students' performance is still very low. Furthermore, this is shown in students' interest and their attitude toward mathematics learning and the poor performance of students in secondary school. The significance of mathematics to the economic and developmental growth of every nation cannot be overlooked.

What is ICT?

The term ICT and which implies Information, Communication and Technology is coined from two terms that imply, Information Technology, Communication Technology. Information is a design discipline, logical, mechanical, and procedure in administration used to deal with data. Keong, Sharaf and Daniel (2005) referred to Information Communication Technology as "an engine of innovation in education". The ICT is explained as the storage, information dissemination and management of different resources and technical tool sets acceptable in the ICTS.

Ameen, Adeniji and Abdullahi (2019) consider the ICT to be an instrument that achieves confidence in the educational system. The ICT is comprised of technology resources and devices utilized for relationship and control of information (Kaware & Sain, 2015, Zakaria

& Khalid, 2016). Prytherch (2000) sees ICTs as organizations that make arrangements for picking up, preparing amazing open doors, and instructing through advanced content conveyance. ICT is exceptionally indispensable to changing the Mathematics teaching-learning process by adding a flavour of vitality to education classroom environments. The ICT apparatuses involve computerized gadgets and electronic gadgets like the web, PCs, and other interactive media innovations. The ongoing ICT computerized are comprised of various conveyance frameworks, the hardware and software. There are different compact ICT instruments utilized in teaching mathematics, similar to automated charting, realistic mini-computers, data sets, particular programming, accounting sheets, and so on.

ICT use and teaching/learning

In the world over, computers as a technology tool are now becoming very vital for our everyday use in our schools. For the ICT technology to be used in the schools it lies on the exposure of teachers and their students. Students having similar ICT technology use depend on their exposure (Gachinu, 2014). ICT incorporation into education has given rise to numerous online educational resources, knowledge exchange, and connections between learning communities (Ferraro, 2018, Konnova, Lipagina, Postovalova, Rylov & Stepanyan, 2019, Mora, Signes-Pont, Fuster-Guillo & Pertegal-Felices, 2020). According to Yusuf (2005) cited in Ameen et al, (2019), ICT has greatly affected learning-teaching and every facet of the system of education.

The ICT assists in building a favorable learning atmosphere for the students and make them acquire knowledge in a constructive, self-directed and active way (Volman & Van Eck, 2001, Ameen et al, 2019). Gachinu (2014) research findings in America revealed that ICT has the force to dramatically remake American schools, raising its performance standards while potentially at the same time cutting costs. The students' ICT use helps or enables them to personalize learning that can result in stronger output, empower and assist them in pursuing their knowledge, provide effective learning, enhance the content and rich information devices that are not restrained to one place.

Students, who are raised in an ICT environment, may probably utilize the web at whatever point they are confronted with a difficult problem and utilizing ICT in various ways to acquire and construct knowledge, solve complex math problems and acquire different skills (Kang, Heo, & Kim, 2011, Gachinu, 2014). Despite the ICT's importance to education, it does not replace the existing teaching methods; instead, it is utilized to make learning-teaching more accurate and meaningful. ICT usage has become more vital in educational institutions because it

helps to build up a conducive, better environment for teaching-learning (Gabare, Gabarre, Din, Shah & Karim, 2014, Daud & Khalid, 2014, Zakaria & Khalid, 2016). This can be found in our school and the library. When the students are taught to use a computer to find a solution to a problem, it helps them work in collaborative groups or apply the problem-solving process to develop the solution.

The ICT develop students' communication, problem-solving skills and lifelong mathematics learning (Voogt, 2003, Ameen et al, 2019). The technology application in education assists in implementing active methodologies and eliminates certain space-time obstacles in the process of teaching-learning (Sánchez-Prieto, Trujillo-Torres, Gómez-García, Gómez-García, 2020). ICT brought about a new type of teaching method that focused on satisfying the individual students' needs and marks leaving the current pedagogy where students have not been well taking care of (Kozma, 1992, Gachinu, 2014). ICT is employed to help change the conventional teaching methods of talking and coping on the instruction board. Instead, it proposes a reason for an education rethink regarding a more current method (White, 2010). The positive ICT impact can be observed through students' academic performance (Alemayehu, Natarajan, 2018, Guillén-Gámez, Mayorga-Fernández, 2020).

The ICT utilization in the mathematics teaching/learning

In recent times, it appears there is a rapid expansion in the use ICT aspect in teaching-learning of mathematics in our schools through computers, video recorders, overhead projectors, internet, calculator, slide projectors, audio-visual materials, printed materials, motion pictures and films, sound etc (Bature,2016). Kelleher (2000), in his study on the recent ICT developments to instruct in schools, observed that the usual classroom teaching method cannot be replaced by ICT. However, rather ICT ought to be a driving force or complement classroom teaching to enhance a more profound comprehension of mathematics concepts and principles that will make mathematics more authentic, motivating, exciting and successful.

Guzel (2011) discovered that the efficient utilization of computers to teach mathematics has made it more effective. Furthermore, Guzel (2011) recommended that there is a need for students and mathematics educators to be acquainted and familiarized themselves with the utilization of ICT devices to promote or make the teaching/learning of mathematics to be viable. The teaching professions have become more complex and challenging because of rapid knowledge expansion that requires new and current technologies. ICTs tools are powerful for mathematics problem-solving, mathematics concept development and

mathematics critical thinking. The ICT prospect will be of great benefit to mathematics teaching but is dependent on some factors, which include mathematics teachers' perceptions about ICT skills, mathematics teachers' proficiency in ICT usage and attitudes of students toward the ICT contribution to learning mathematics.

The ICT brought many changes to mathematics education in this 21st century. The application of this current ICT technology's potential benefits to education is that, it promotes or enhances and makes mathematics teaching more effective (Skinner & Preece, 2003, Gachinu, 2014). The ICT utilization by teachers, teaching mathematics implies that their attitude toward technology is positive. Effective technology use has simplified mathematics works or tasks significantly. The ICT motivates the students' in mathematics learning and enhances collaborative work among students (Griffith, Hagan, Heymann, Heflin & Bagner, 2020, Dalby, 2019, Andersen, Beuchert, Nielsen & Thomsen, 2020, Mikropoulos, 2018).

The ICT tools usage in mathematics teaching helps students understand better and give fast bits of knowledge into the mathematical concepts. It supports the mathematics educators when instructing their students in designing, producing their knowledge presentations, and equipping them with learning experiences. The ICT application gives the students a quick comprehension of the mathematical concepts by using different available technologies to the mathematics educators designed to match the user characteristics and the required mathematics curriculum tasks (Leask et al., 1999). The total utilization of these technological tools in our school system will improve instructing and learning. It will result in a student's greater comprehension of mathematics instead of mere memorization and struggling to grasp the concepts. The resultant effect of this ICT use will result in a good student's mathematics performance.

ICT use and Mathematics

According to Rahman, Ghazali, and Ismail (2003) cited in Gachinu (2014) on the mathematics teaching using ICT, he linked the ICT uses in three different ways; to them, it is utilized to find solution to problem or as a modeling tool, tools for data analysis and as for integrating mathematics with context. From the research carried out in Uganda and Kenya, it was discovered that teachers of mathematics rarely use ICT to teach mathematics (Kidombo, 2010). The Earlier studies of Polya (1957) cited in Gachinu (2014) indicated that the problem-solving process in mathematics involves four steps: it entails the total comprehension of the problem, seeking a way(plan) or solution, making proper use of this plan and then reflecting or

examining the previous solution. All these four steps required the students' ability and a deeper comprehension of the problem then devise means for solving them. The cognitive ICT tools help foster the mathematics concepts learning and students' problem-solving approaches (Alonso-Garcia, Aznar-Diaz, Caceres-Reche, Trujillo-Torres & Romero-Rodriguez, 2019).

Despite headway of technology, its development and integration into teaching mathematics have been lower than expected (Lavicza, Prodromou, Fenyvesi, Hohenwarter, Juhos, Koren & Diego-Mantecon, 2020). Ameen et al, (2019), in their study on educators and students' ICT tools utilization levels for mathematics learning and teaching in Nigeria. The sample of 170 students and 50 teachers of mathematics were selected randomly from secondary schools. The study instrument was a questionnaire; in analyzing the data Chi-Square and simple percentages were used. Their findings revealed that although both the mathematics teachers and students utilize ICT tools to teach and learn mathematics, but not skilled in utilizing them. This, therefore, indicates that much is likely not to be achieved since they lack the skills. This shows that both educators and students need proper orientation and preparation in the application of ICT for it to be meaningful and successful. It is necessary to properly train the mathematics educators to effectively apply technology in their classroom (Baya'a, Daher & Anabousy, 2019).

The teacher's utilization of ICT tools is influenced by their perception and the training they received (Sánchez-Prieto, Huang, Olmos-Miguelanez, Garcia-Penalvo & Teo, 2019). According to Daniels et al, (2018), ICTs is devices that should be well chosen and appropriately applied by the mathematics teacher. They opined that effective strategy methodology should positively impact students' learning The utilization of mathematical software in secondary schools helps in promoting the practice, establishing collaborative learning environments, assisting students in interpreting relationships among graphs and functions, assisting the students understanding the complex algebra and arithmetic concepts (Çekmez, 2019, Acikgul, Aslaner, 2020, Donnelly-Hermosillo, Gerard & Linn, 2020, Verscha_el, Depaepe & Mevarech, 2019), Technology helps teachers develop abstract mathematics concepts and thereby build the students' prior skills, knowledge, abilities, connect materials to the basic mathematical concepts, take care of common understandings of concepts and introduce them to more progressive concepts (CTLI, 2007, Dirgha, 2017).

The ICT helps mathematics teacher in teaching mathematical concepts, facts, and knowledge and make mathematics understanding more

successful and increase the teachers' and students' capability. It is indispensable in mathematics learning and teaching; the ICT promotes learning and influences mathematics teaching (NCTM, 2000, Dirgha, 2017). The Pedagogical shift of utilizing ICT brought in new teaching approaches to widening the conceptual students understanding, the strategic, procedural fluency and mathematics competency. The ICT makes mathematics teachings better and assists to improve students' achievement (Safdar, Yousuf, Malik, & Behlol, 2011, Gera & Verma, 2012, Dirgha, 2017). Rendall (2001) discovered that ICT assists teachers in building students' logical and arithmetical mathematics skills. Rendall (2001) revealed that ICT helps the teaching to be efficient in improving the students' logic and arithmetical. Karami and Attarn (2013) revealed that including problem-based learning and technology into education effectively promoted teachers' teaching skills and students' knowledge.

The ICT use and students' performance in mathematics

Bature (2016), in his study to determine ICT use as a tool for effective mathematics learning and teaching, used a research survey design and questionnaires as the instrument for the study that was administered to students and teachers. Chi-square and simple percentages were applied for data analyses. His study exposed that when the students used ICT it leads to improved skills in problem-solving and mathematics achievement. Bature (2016) findings revealed that the use of ICT devices enhances students' performance in mathematics and students' mathematics problem-solving. It indicated that when tools of ICT were used, it assists as a motivating force that drives the students to study thereby helping in arousing students' interest in mathematics. Relating to this study, for students' performance to be enhanced, enhance students' skills in problem-solving and mathematics teaching, therefore applying the ICT devices in teaching mathematics should be practical (Bature,2016). The proper utilization of this technology is of great importance, if it is effectively applied to the learning/teaching of mathematics if not there may be no good result, and it will result in a fruitless exercise

Why mathematics teachers should integrate ICT into teaching

With the advent and development of the current technology era, the mathematics educator is encouraged to key into utilizing ICT in his/her teaching as a substitute to conventional teaching methods (Kiflee & Khalid, 2014, Zakaria & Khalid, 2016). This technology called ICT acts as a motivating force for the mathematics teachers to perform their education function, not just learning and instruction tool (Nur &

Hazman, 2006). For instance, ICT applications could assist students to gain different skills and connect them to future needs, like the internet learning processes, Microsoft Word and email (Gabare et al, 2014, Khalid, 2014, Jones, 2011, Zakaria & Khalid, 2016). The ICT devices can be utilized by the mathematics educator to enhance student productivity in low-level tasks, repetitive that involve computation and problem-solving. Apart from being important to the mathematics educators in developing skills of students, it is of great benefit or prerequisite to enhance some higher-level tasks (Newhouse et al., 2002). Teachers of Mathematics who use computers are likely to develop better attitudes in teaching when using computers, which will likely help them, maintain students' interest in the broader range.

ICT application helps mathematics teachers get resources from outside the internet, thus helping them transform teaching. The main reason for applying ICT is to refine, raise the qualities of mathematics teachers' teaching and students' learning (KPM, 2013). The ICT assists in fitting technology to different learning and teaching conditions, whether within the classroom or outside the classroom setting (Norazrena & Khairul Anuar, 2011, Nur & Hazman, 2006). The incorporation of ICT in school could increase teachers' and the student's competency, which lies in global needs by sharing knowledge and skills (Storm, 2011). It also assists increase cooperative learning among students through community practice (Khalid, Joyes, Ellison, & Abdul Karim, 2013, Khalid, Joyes, Ellison & Daud, 2014).

Some mathematics ICT resources

These mathematics ICT resources could be applied in diverse ways, such as data capturing, simulation, digital recording equipment, presentation tools, and computer projection. There are tutorial software applications that present information check learning by the question method and answer, judge responses, and provide feedback while letting them to teach personally (Newhouse et al., 2002). The multimedia and interactive features can assist students to figure out more complicated mathematics concepts like the three-dimension (3D) (Gachinu, 2014). The inclusion of ICT into education or learning environment has been revealed to build learning to be more student-centred, encourage cooperative learning amongst students, and increase teacher-student interaction. Teachers who use ICT devices in their pedagogy are more likely to benefit from progressive reflection and thought (Newhouse, 2002, Gachinu, 2014)).

Gachenga (2007) identified demonstration, assignments, practice and drills as the standard methods applied by the teachers of mathematics when teaching. These particular methods tend to slow down students'

problem-solving cues and creativity; it was discovered that using or having unlimited access to learning technologies usage would be a very vital aspect in teaching abstract mathematics such topics as the 3D geometry which will arouse the student toward good performance (Gachenga 2007, Gachinu,2014). ICT Technology provides teaching/learning tools for mathematics (Ahmad, Hoda & Alahmari, 2020). Some teachers feel that ICT software cannot be functional in mathematics teaching. ICT can be utilized in every subject, mathematics inclusive.

Keong et al, (2005), in their study, stated that 89.5% of mathematics teachers use basic ICT tools when teaching. Furthermore, these basic ICT tools include graphics and visuals, online demonstrations and training software. This exposed that the mathematics teachers' skills in ICT have improved in applying different technology resources in their classroom teaching (WanMohd, 2013). Keong et al. (2005) work also uncovered that 68.5% of mathematics teachers search through internet websites, 44% use email, while in the online forum 7.2% participated in the discussions (Keong et al,2005). These percentages are associated to the teachers' capability to utilize ICT in accessing teaching resources outside textbooks. We say that ICT has turned out to have become a vital means through which the teachers can obtain teaching resources, simulations, information sharing and brainstorming. Microsoft Excel technology aids students carry out problem-solving related to algebra, like equation graphs construction, finding the gradient of a straight-line graph, and simplification of equations.

Some developed ICT software for Mathematics teaching

Some ICT software can be useful in teaching mathematics, whether at the primary or secondary school stages. This software aids and serves as complementary materials for the mathematics teachers during teaching and students' revision in school and outside school. The ICT technology assists students in working their mathematics problem-solving or their assignments at home. Many recent studies have supported that technology has lots of benefits to mathematics teaching/learning (Alonso-Garcia et al, 2019, Fernandes, Rodrigues & Ferreira, 2018).

Zakaria & Khalid (2016) cited Norazrena and Khairul (2011) developed software for educating and learning fractions. It was advanced in light of a model called ADDIE, which means Analysis, Design, Develop, Implement, and Evaluation. The developers of this software carried out their study by using secondary school students. This software focuses on special needs' students and its content is founded on basic fractions concepts, such as addition, subtraction, and

proper fractions. Their results exposed an enhancement in the students' achievements after utilizing the software. It also revealed that the software application reduced the students' cognitive weight during learning owing to its straightforward content with simple illustrations that were explicit. Although this software was purposely developed for students of special needs, it could likewise be effective for students of non-special needs in enhancing their basic knowledge of fractions concepts.

Zakaria and Khalid (2016) cited Neurath and Stephens (2006) in their experimental study using secondary school students. In their study, Microsoft Excel was utilized as a support to teaching in an algebra class. The control group was educated using traditional methods, while the experimental group was engaged in the computer laboratory. Different problems were assigned to the two groups, but those in the experimental group were shown the procedures on how to tackle the problems through Microsoft Excel. Three detailed tests which involve similar questions were shared with both groups. Their findings revealed that the students' interest in the subject was higher, and students' achievement is enhanced slightly in the experimental group. The reason for the improvement may be that the students enjoyed Microsoft Excel utilization for problems solving; hence their overall comprehension of algebra was increased, which went well with technology and computers. The inclusion of ICT into education with digital resources and methodologies has resulted in its development exponentially (Prendes-Espinosa, Garcia-Tudela & Solano-Fernandez, 2020).

The ICT utilization in the developing countries' educational institution

Many developing nations, including Nigeria, are yet to meet up with ICT application in schools; this might be owing to lack of education funding, shortage of qualified ICT skills teachers, ICT resources and be short of infrastructure. Numerous developing nations' educational policies consider ICT and digital competency as very vital in teaching. However, they are yet to spend in training and acquiring technological resources to be applied in education. One method the governments can improve this; making the instructional objectives to be explicit, and enhancing the education quality through the efficient utilization and ease of access to ICT, because it allows students' needs, interests, weaknesses and strengths to drive the course of learning with a teacher overseeing instead of dictating (Rogers, 1995, Gachinu, 2014). From studies, it was revealed that some African countries, Nigeria inclusive, have not fully felt the ICT impact on the educational system, although

the federal government, state government and Education Ministry recognizes the vital function of the ICT in the education of every country, but there is a call for an ICT literate workforce to improve its productivity and involvement in the understanding of the global economy, but they are yet to fully key into it.

If the developing countries' government really recognizes the ICT function in education, they would have increased ICT infrastructure investment and education resources and the ICT in various educational institutions (Morrison, 1998, Gachinu, 2014). Kozma (1992) in his work on the degree of ICT utilized in education observed that while ICT utilized is advancing in developed nations, some developing countries were still lagging in ICT integration into education. Gakuu and Kidombo (2010), in their study, discovered that inclusion of ICT is a policy that is embedded in most private schools. However, these policies are missing in Kenya's public schools then gave an instance of some sampled private schools where they make computer literate a mandatory requirement for seeking a teaching job in their different schools to be qualified. These schools integrated this technology into their schools to attract more students and improve students' performance. These schools recognize the vital nature of technology to education.

Apart from Kenya as a country, it is common for some Nigeria's schools and other developing countries although the government is slow in integrating or providing the ICT resources into public schools, some private schools in these countries try their best to ensure that students and teachers are ICT compliance. The developing nations such as Nigeria and others have not fully recognized the ICT's function in learning/teaching, not knowing that all countries need a workforce that is ICT literate in this current globalized economy to enhance its participation in the knowledge economy (Gachinu, 2014). The federal government and the education ministry assumed that ICT in education is a normal platform to equip countries with ICT abilities for dynamic, rapid and sustainable economic growth, but this is just in theory or paperwork; this is evident in the covid-19 pandemic period, most of these developing countries education system was shut down due to ICT facilities shortage and shortage of qualified staff to operate these ICT technologies where they are available. They were not able to implement or cope with online teaching because most public or government schools lack ICT equipment; even teachers to operate or teach this ICT are not available. Some private schools with ICT equipment succeeded in operating online teaching because they recognize the ICT benefit and make provisions in their different schools.

Failure of any country to integrate or update ICT devices in their education is at severe marginalization risk on the global scene. For them not to be left behind in this technology era, their governments should adopt the ICT in their educational institution. Many private schools have adopted the use of ICT in schools. The ICT inclusion in these private schools was done to attract more students to their schools and boost their student's performance.

The benefits of ICT utilization to mathematics education

Ittigson and Zewe (2003) opined that ICT is an indispensable tool for mathematics teaching/learning. ICT improves the knowledge of students in the basic mathematics concepts and improves the teaching of mathematics in schools. Different researches have been done to evaluate and ascertain the benefits accrued to ICT uses in learning and teaching Mathematics. Mdlongwa (2012) cited in Dirgha (2017), **x**-ray some gains of utilizing ICT to teach and learn mathematics; with the ICT, students can be linked to experts and have access to excellence global resources and learning resources. Students can enhance their knowledge, do standard work, browse the internet to source mathematics materials, get information, thereby making communication to be faster and easier and acquiring more mathematical knowledge or skills that can be applied outside the school or workplace which cannot be obtained elsewhere (Dirgha,2017).

Becta (2003) cited in Keong et al, 2005) listed some advantages of ICT tools utilization in teaching/learning of mathematics as; i) it encourages knowledge sharing and communication ii) it promotes greater collaboration between teachers, students and teachers, and among the students. iii) it encourages positive motivation through rapid and accurate feedback it gives to students; iv) it also assists constructivist pedagogy. Students apply technology in exploring and understanding mathematics concepts (Keong et al, 2005). Goos (2010) stated that digital technology assists students to be efficient and accurate in mathematics learning.

Numerous factors affect the utilization of ICT in instructive practices, such as policy, human resources, infrastructure, technical, hardware and software associated factors. For the incorporation of this technology to be effective, the mathematics educators should be knowledgeable about the existing software used by them; otherwise, it will be the reverse.

Conclusion

Education is very essential; it is the engine of any nation's development. Many nations that have developed economically, socially and technologically today because of the type of education they adopted. Any nation that neglects its education cannot develop. In this recent time, there has been a transformation in the method of teaching and learning in our schools as a result of the emergence of ICT. Many developed countries have integrated ICT into their education system. Most developing countries are yet to assimilate the ICT into their schools, even though they recognize the significance of applying ICT resources. The drawback of these developing countries in including technology in schools may be because of lack of education funding, total neglect of the education sector, shortage of ICT facilities/ infrastructures and shortage of trained staff that are ICT compliance to handle these ICT tools once provided.

From the appraisal of the related literature, we discovered that there are lots of benefits that in applying ICT in teaching and mathematics learning. The ICT devices assist the teachers in explaining those abstract topics and making mathematics concepts to be extra real and meaningful to students for easy comprehension.

For mathematics teaching to be effective in our schools there is a need for the government of every country most especially the developing countries to properly integrate these ICT tools into their school. If the federal, state and those concerned in education sectors want the students' performance in mathematics to be enhanced they should not neglect the full inclusion of ICT in education. Teachers should be trained in the aspect of ICT utilization for effectiveness. Most teachers in the school are not computer literates talk less of utilizing the ICT soft wares.

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THE FORMATION OF SELF-IMAGE OF PRIMARY CLASS STUDENTS IN THE PROCESS OF RECEPTION OF THE LITERARY TEXT

(ANALYSIS OF THE CONTROL EXPERIMENT)

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Abstract: *This article presents the analysis of the control experiment, reflected in the test applied to third and fourth grade students in the Republic of Moldova and in Romania, in the framework of research on the formation of the self-image of primary school students in the process of receiving the literary text. Following the completion of the optional discipline "Read and know yourself!", through which the formation of the students' self-image was pursued through literary texts, the students from two grades of third and fourth, each from Romania and the Republic of Moldova, completed a test with items based on a literary text, with answers aimed at the level of reception of the reproductive, productive or creative literary text, in order to identify the level of reception of the prevailing literary text. Comparative analyses were made between the results obtained in the ascertainment experiment and the control experiment, as well as between the results obtained by each individual student, demonstrating their evolution in terms of self-image formation. The use of literary-artistic education, respecting its own methods and principles through the optional discipline resulted in the formation of a positive self-image in students. The results of the pedagogical experiment allow the finding that the level of self-image formation of the students in the experimental classes increased considerably in relation to the level of the self-image*

formation of the students in the control classes. This confirms the validity of the research hypothesis as well as the effectiveness of the methodology of forming the students' self-image in the process of receiving the literary text.

Keywords: *self-image; literary text; student; literary-artistic education; experiment; questionnaire.*

Introduction

Emil Verza states that "early school age is the period characterized by rapid quantitative and qualitative accumulations that do not refer only to the field of language facts, but to the entire mental activity". Literature, even at the level at which it is represented in the reading manuscripts from the primary cycle, brings children closer to reality, allows wide perspectives towards the knowledge of other forms of reality. The revelation of literature is prepared above all by the aesthetic side of education. Expressive reading and methods that make students discoverers of an immense treasure of information, of human experiences, of moral patterns, of emotions and feelings, will eventually impose literature on their attention.

Entering in school, the young schoolboy diversifies his range of concerns, becomes more organized in his actions, has an organized lifestyle, makes great efforts to cope with educational demands, "learns new things and in general how to think, memorize, to observe, to express ideas, is disciplined and stimulated. All this constitutes an important moment in the child's mental development, allowing him to make progress in understanding and knowing the world," states Emil Verza in the book "The verbal behaviour of primary school children".

In the work „*Self-knowledge and personality knowledge"*, Vasile Pavelcu states that the formation of self-image is not an external process, it penetrates organically, being the essential direction of becoming the personality itself. The individual is both subject, carrying out the process of information processing and integration, and object, providing information. Regarding the formation of the attitude towards themselves, referring to the children, Vasile Pavelcu says that "the assessment made by the teacher, internalized by the student, becomes self-assessment". At the basis of the study of the literary text with the aim of forming the self-image of students, were the theoretical-epistemological resources of literary-artistic education, which include: ELA principles, the concept of ELA, the theoretical model of ELA.

Materials and methods

Purpose. Objectives. Research hypothesis.

The research started in 2019, with the analysis of the curriculum and textbooks of the Romanian language and literature for the 3rd and 4th grades, both in Romania and in the Republic of Moldova. The existence of some literary texts and exercises aimed at forming students' self-images through literary texts was researched.

Their lack generated the need to think about the optional discipline Read and know yourself!, with its own curriculum and special aids for students and teaching staff. This discipline was followed by students in the 2021-2022 school year.

The purpose of the research is to reveal some methods corresponding to the literary-artistic education for the formation of the self-image of primary school students in the process of receiving the literary text.

The object of the research is the formation of the self-image of primary school students in the process of receiving the literary text.

Research hypothesis: If methods corresponding to literary-artistic education will be applied for the formation of the self-image of primary school students in the process of receiving the literary text, then the quality of the self-image will be better.

The development and application of didactic technologies for the formation of the self-image of primary school students in the process of receiving the literary text will be effective if: the teacher will take into account the origin of the literary text in art as well as its approach through methodologies specific to the system of literary-artistic activities ; through the literary text, the teacher will propose not so much the forced formation of moral qualities according to artistic models (characters), but will contribute to intrapersonal development through self-knowledge; it will contribute to the formation of the competence to interpret the artistic image through the procedures of the formation of the self-image; in the reading process, the student's development will be contributed to as a valorizing subject of the lecture tools, through which the life and aesthetic experience will be updated with each reading: the freedom of imagination and own opinion will be ensured.

Research objectives:

- establishing the psycho-pedagogical and literary-artistic benchmarks for the formation of the self-image of primary school students in the process of receiving the literary text;
- studying the practical situation regarding the formation of the student's self-image; applying questionnaires to investigate the student's self-image;

• revealing, in the process of the pedagogical experiment, the tendencies and particularities of the formation of the student's self-image, as well as the validation of the formative approach within the control stage;
• creating opportunities to introduce didactic technologies specific to the system of literary-artistic activities for the formation of the student's self-image;
• formulating general conclusions and recommendations regarding the formation of the self-image of primary school students in the process of receiving the literary text.

Research variables and sampling

Therefore, the research variables were established:

• **dependent variable –** the level of development of students' self-image

• **independent variables-** applying appropriate methods corresponding to literary-artistic education for the formation of the self-image of primary school students in the process of receiving the literary text, within the optional discipline Read and know! (with a specific curriculum and auxiliary)

Pedagogical research represents a strategy designed and carried out with the aim of capturing relationships and facts between the components of the educational action and to develop on this basis optimal solutions for the educational process.

In carrying out the research, two samples of students were used, constituting the training group (L.T) and the control group (control) (L.M.).

The control group was trained according to traditional pedagogical methods: didactic exposition, demonstration, observation, working with the manual, the teaching staff manifesting a rigid, non-permissive relationship with the students.

The training batch was influenced by the ELA principles of receiving the literary text, within the optional discipline ,,Read and get to know yourself!", with a specific curriculum and with its own auxiliaries (for students and teacher).

Both the control group and the training group are classes made up of 3rd and 4th grade students. They are similar groups, approximately homogeneous in terms of characteristics, close in level of development of intellectual abilities. The sample included in the research has the following characteristics:

Group type	**country**	**school**	**grade**	**Total students**	**No girls/boys**	**age**			
						8	**9**	**10**	**11**
L.1.F. (training group 1)	Republic of Moldova	Theoretical High School "Ion Creangă" Chişinău	4B	38	No. girls			20	
					Nr. boys		1	12	5
L.2.M (control group 2)	Republic of Moldova	Theoretical High School "Ion Creangă" Chişinău	4D	38	No. girls		1	21	1
					Nr. boys			14	1
L.3.F (training group 3)	Republic of Moldova	Theoretical High School with Sports Profile No.2 Chişinău	3	24	No. girls		10		
					Nr. boys	1	11	1	1
L.4.M (control group 4)	Republic of Moldova	Theoretical High School "Ion Creangă" Chişinău	3 B	24	No. girls		5	1	
					Nr. boys		17	1	
L.5.F. (training group 5)	Romania	Secondary School No. 8 Piatra-Neamt, Neamt county	3 A	30	No. girls		13	1	
					Nr. boys	1	15		
L.6.M (contr	Romania	Secondary	3 B	30	No. girls		14	6	1

ol group 6)		School No. 3 Piatra-Neamt, Neamt county			Nr. boys		4	4	1
L.7.F. training group 7	Romania	Secondary School No. 8 Piatra-Neamt, Neamt county	4 A	22	No. girls			6	4
					Nr. boys			8	4
L.8.M (control group 8)	Romania	Secondary School No. 3 Piatra-Neamt, Neamt county	4 A	**22**	No. girls			6	4
					Nr. boys			7	5
			Total pupil	**228**	No. Girls:114				
					Nr. boys:114				

Table 1. The control group and the training group

- 228 students from the urban environment
- 104 students from Romania, 124 students from the Republic of Moldova
- 108 students from the 3rd grade, 120 students from the 4th grade
- 93 students aged between 8/9 years, 135 students aged between 10-11 years
- 50% girls and 50% boys. All students attended kindergarten and previous grades and have parental consent for the research

Volume: the sample size is 228 students from the 3rd and 4th grades, from urban schools in Romania and the Republic of Moldova.
The division into research lots/groups and the sampling procedure used

• type: is a representative batch for the population of primary school students from Neamț, Romania and Chisinau, Republic of Moldova.
• we opted for non-random sampling, in which we will use "available subjects".
Research sample: 228 students from the 3rd and 4th grades, from schools in Romania and the Republic of Moldova
The experimental sample (training group): 54 students from the 3rd grade (30 students from Romania and 24 students from the Republic of Moldova) and 60 students from the 4th grade (22 students from Romania and 38 students from the Republic of Moldova)
The control sample (control group): 54 students from the 3rd grade (30 students from Romania and 24 students from the Republic of Moldova) and 60 students from the 4th grade (22 students from Romania and 38 students from Republic of Moldova)

Research methodology
Qualitative methods are used to obtain richer and more in-depth data.
Qualitative research has methods, techniques and study tools, adapted to the specifics of the problem which we study.
The research methodology includes the following types of methods:
1. pedagogical:
1.1. theoretical: bibliographic, monographic research: scientific documentation-the research method of curricular documents and other school documents-through which the authentic, contemporary methodological trends of the curriculum and textbooks of the Romanian language and literature will be analyzed, for the 3rd and 4th grades,
1.2. empirical: the pedagogical observational, formative and control experiment, as a data collection method, for this study, by applying T1 and T2 (tests with items based on a literary text) and the questionnaire instrument, and for measuring the data from the questionnaire, Likert scale was used.
2. statistics: statistical processing and interpretation of data from a quantitative, qualitative, graphical point of view and through variation indicators.

In 1879, W. Wunat introduces the experiment as a specific research method in psychology. It was the moment when psychology was established as an independent science, separating itself from philosophy.

During its evolution, the experiment which at first was applied only in the study of sensory and motor processes, is used today in the research of all psychic processes and functions.

Summarizing its main characteristics, in 1963, Festinger & Ratz defined it as "the observation and measurement of the effects of an independent variable on the dependent variable, in a situation where the action of other factors (actually present, but foreign to the study) is minimized". Thus, the elicited and controlled observation called an experiment involves the following basic concepts: variables, experimental situation and experimental manipulation.

The experiment involves the isolation of a variable (the independent variable), the intervention on this variable (the manipulation of the independent variable), following the effects of this variable on the dependent variable. In carrying out the experiment, the aim is to inventory the factors, the variables that could have an effect on the dependent variable and keep them under control, manipulating only the independent variable that interests us. In the context where the other variables relevant to the dependent variable are controlled, then only the manipulated independent variable can be responsible for the changes in the dependent variable. Depending on where the experiment takes place, in this case it is a natural one.

The questionnaire, which will be used in the control stage, is a data collection tool, a basic tool in the collection of information.

The questionnaire technique was initiated in pedagogy by Alfred Binet, in 1903. It represents a set of questions with the aim of collecting the necessary data to achieve the research objectives. In developing the questionnaire, the following objectives were considered: transforming the necessary information needed in the research into a set of questions that students can answer, motivating and encouraging students to communicate and cooperate - minimizing the risk of boredom and fatigue, minimizing the risk of errors.

The self-image identification questionnaire of students aged 9 to11, which will be applied in the control experiment, includes ten questions.

The Likert scale “consists of a series of items to which the subject must respond; the respondent indicates agreement or disagreement with each item on a scale of intensity; the Likert technique produces an ordinal scale that typically claims non-parametric statistics. The scale is very reliable if used to roughly rank individuals with respect to a certain attitude or a complex of attitudes; the score includes a measure of intensity as expressed in each sentence tested."

• we made a set of sentences that represent statements of a favourable or unfavourable nature to the stimulus that is the object of the investigation,

• the sentences are presented to each of the subjects whose opinions will be scaled in relation to that information contained in the sentence

• we used five gradations of the scale, from total agreement to total disagreement.
• the sentences are presented to the subjects and they must present their agreement, they give their disagreement by ticking with X one of the five gradations of the scale, total agreement: agreement: indifferent: disagreement: total disagreement
• the distance between the different points of the scale is perfectly equal
• after the administration of the questionnaire, if it is a favourable statement, as the case may be, the following numerical values are attached to each gradation: +2,+1,0,-1,-2. (in the case of an unfavourable statement, the order of the values numeric is reversed)
• the score that will be achieved by a subject is calculated by making the algebraic sum of the numerical values, which characterize his opinion regarding each sentence of the questionnaire.
The questionnaire also used some identification data such as: class, school, country, gender, age.
The application of the questionnaire to investigate the student's self-image represents the study of the practical situation regarding the formation of the student's self-image, with the aim of confirming or denying the research hypothesis and will be applied after the students (experimental group) will follow the optional discipline Read and know- te!, which will create opportunities to introduce didactic technologies specific to the system of literary-artistic activities for the formation of the student's self-image. The students will go through a specially created curriculum, they will study from a specific manual/teaching aid and they will use an appropriate aid, also made within the research.
Early diagnosis of unfavourable self-image will allow the development of an adequate self-image formation program, which would reduce the risk of behaviour problems and learning outcomes in the immediately following periods: preadolescence and adolescence.

Analysis of data from the control experiment, reflected in the test applied to third and fourth grade students in the Republic of Moldova and Romania.

For this stage, as part of the control experiment, we proposed applying a test similar to the one in the ascertainment stage, namely test 2 - test with items based on a literary text.
In table below, the students' activity is presented synthetically, within the control experiment.

The group of the control experiment							
Group type	**country**	**school**	**grade**	**Group type**	**Total students**	**Sample type (control experiment)**	**Date of the control experiment**
L.1.F. (training group 1)	Republic of Moldova	Theoretical High School "Ion Creangă" Chişinău	4 B	training	38	Test with items based on a literary text	May 2022
L.2.M (control group 2)	Republic of Moldova	Theoretical High School "Ion Creangă" Chişinău	4 D	control	38	Test with items based on a literary text	May 2022
L.3.F (training group 3)	Republic of Moldova	Theoretical High School with Sports Profile No.2 Chişinău	3	training	24	Test with items based on a literary text	May 2022
L.4.M (control group 4)	Republic of Moldova	Theoretical High School "Ion Creangă" Chişinău	3 D	control	24	Test with items based on a literary text	May 2022

L.5.F. (training group 5)	Romania	Secondary School No. 8 Piatra-Neamt, Neamt county	3 A	training	30	Test with items based on a literary text	May 2022
L.6.M (control group 6)	Romania	Secondary School No. 3 Piatra-Neamt, Neamt county	3 B	control	30	Test with items based on a literary text	May 2022
L.7.F. training group 7	Romania	Secondary School No. 8 Piatra-Neamt, Neamt county	4 A	training	22	Test with items based on a literary text	May 2022
L.8.M (control group 8)	Romania	Secondary School No. 3 Piatra-Neamt, Neamt county	4 A	control	22	Test with items based on a literary text	May 2022

Table no. 2. Students' activity in the control experiment

The tables with the 3rd and 4th grade students from Romania and the Republic of Moldova, participants in the control experiment, as well as quantitative indices, can be found in the appendices of the research.
The main objectives of the control experiment were:

• Presentation of the dynamics obtained through the qualitative evolution as a result of the application of the techniques of forming the students' self-image in the process of receiving the literary text, in parallel with the control ones (witness)

• Parallel between the results initially obtained in the observation experiment and those in the control stage
• Demonstration of the effectiveness of the didactic model, oriented towards the use of the literary text in the process of forming the self-image of the students
• Confirmation of the scientific basis of the hypothesis
• Formulation of general conclusions regarding the effects of the methods of forming the students' self-image in the process of receiving the literary text, in the 3rd and 4th grades.

The formative effects of the methods of forming the students' self-image in the process of receiving the literary text, in the 3rd and 4th grades, in the Republic of Moldova and in Romania

The students were proposed to solve a test similar to the one used in the finding experiment sample (test 2).
During the experiment, we tracked the identification of students' emotions, ideals, acts of will, self-appraisals, convictions, personal conceptions, determined by reading a literary text, following the training experiment carried out in the experimental classes.
The instrument used was a test based on a literary text, with seven multiple-choice items (test 2), which assumed the existence of a question from the proposed text, and a list of three alternatives-possible solutions. The student must choose only one answer, considered by him to be the best solution.
The analysis of the students' answers to the seven questions, found in appendices 11-18, demonstrates that the objectives of the training experiment have been achieved, in this sense we present clues from tables 3 and 4 and figures 1 and 2, illustrated below.

	Republic of Moldova							
The level	**L.1.F. (aIV-a)**		**L.2.M(aIV-a)**		**L.3.F. (aIII-a)**		**L.4.M (aIII-a)**	
	training	**control**	**training**	**control**	**training**	**control**	**training**	**control**
Reproductive (a)	63.16 %	0.37 %	52.26 %	53.76%	67.26 %	1.79 %	60.71 %	48.21%
Productive (b)	35.34 %	32.71%	46.24 %	41.73%	30.36 %	42.26%	39.29 %	48.21%
Creative (c)	1.50 %	66.92%	1.50 %	4.51 %	2.38 %	55.95%	0%	3.58 %
Total students	**38**		**38**		**24**		**24**	

Table 3. Quantitative values of the experience of students' self-image formation in the process of receiving the literary text, in the 3rd and 4th grades, in the Republic of Moldova

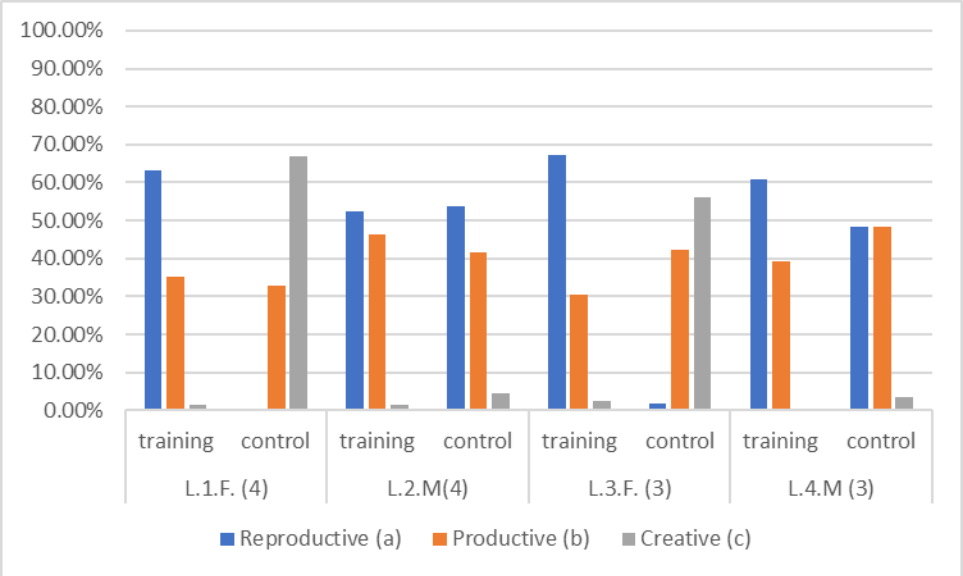

Figure.1. Quantitative values of the training experience of students' self-image formation in the process of receiving the literary text, in the 3rd and 4th grades, in Republic of Moldova

	Romania							
The level	**L.5.F. (3)**		**L.6.M (3)**		**L.7.F.(4)**		**L.8.M(4)**	
	training	**control**	**constatare**	**control**	**constatare**	**control**	**constatare**	**control**
Reproductive (a)	28.57%	0%	37.62 %	30.48%	27.27 %	0%	66.88 %	29.87%
Productive (b)	71.43%	44.76%	58.57 %	67.62%	72.73 %	30.52%	33.12 %	45.45%
Creative (c)	0%	55.24%	3.81%	1.90 %	0%	69.48%	0%	24.68%
Total students	**30**		**30**		**22**		**22**	

Table.4. Quantitative values of the training experience of students' self-image formation in the process of receiving the literary text, in the 3rd and 4th grades, in Romania

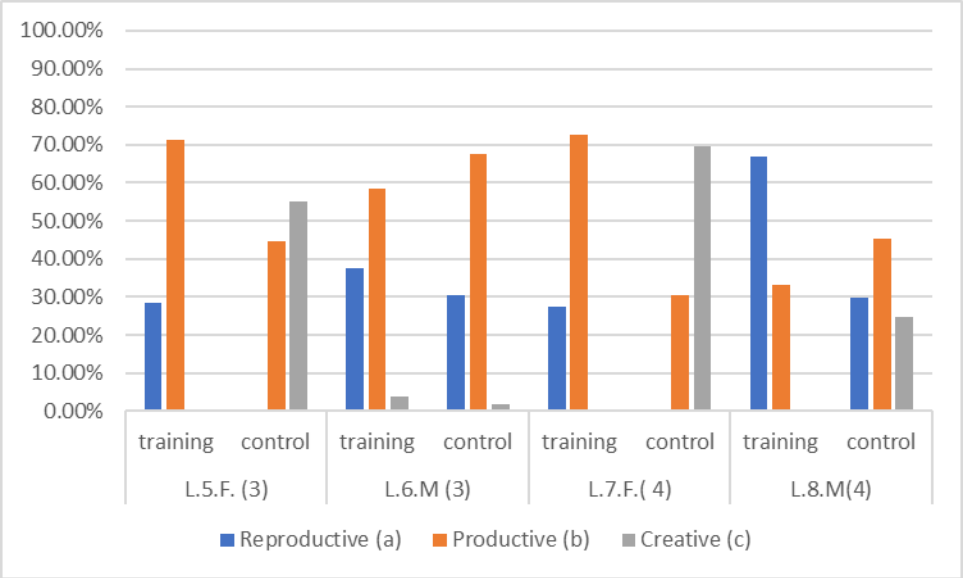

Figure 2. Quantitative values of the training experience of students' self-image formation in the process of receiving the literary text, in the 3rd and 4th grades, in Romania

The obtained data were processed and expressed in different graphs to be able to easily observe the difference between the results, which would facilitate both a quick interpretation and a clear visualization of the results.

Following the analysis, the level of reception of the literary text can be observed, both for the training groups (1,3,5,7) and for the control group (2,4,6,8), in the control experiment.

In contrast, we analyze for the Republic of Moldova, in the 4th grades L.1.F. and L.2.M., where we identify the following aspects:

• The reception level of the reproductive literary text has a considerable decrease in L.1.F., but in L.2.M. rose more than 1%,

• The reception level of the productive literary text has a decrease both at L.1.F. and at L.2.M.,

• The level of reception of the creative literary text shows an increase of over 60% in the answers both to L.1.F. and to L.2.M. only 3%.

In the 3rd grades, batches L.3.F. and L.4.M, we find the following:

• The reception level of the reproductive literary text has a considerable decrease, of over 60% in L.3.F., and in L.4.M. of 12%,

• The reception level of the productive literary text has increased by 12% at L.3.F., and at L.4.M. by 9%

• The reception level of the creative literary text has increased by 50% at L.3.F., and at L.4.M. of over 3.50%.

For Romania, in the 3rd grades, we note the following aspects:

• The reception level of the reproductive literary text shows a considerable decrease, at L.5.F., and at L.6.M. of only 7%,
• The reception level of the productive literary text has a decrease of almost 30% in L.5.F., and in L.6.M. an increase of 3%,
• The reception level of the creative literary text shows an increase of over 50% at L.5.F., and at L.6.M. a decrease of about 3%.
In the 4th grades, it can be observed that:
• The reception level of the reproductive literary text shows a total decrease at L.7.F., and at L.8.M. by almost 50%,
• The reception level of the productive literary text has a 40% drop at L.7.F., and at L.8.M. registers an increase of 12%,
• The level of reception of the creative literary text shows an increase of almost 70% of the total responses to L.7.F., and to L.8.M. registers an increase of almost 25%.
If in the control groups there is a fluctuation in the answers aimed in particular at the reproductive and productive levels, we notice that in the training groups the greatest increase is recorded in the answers that are attributed to the creative level of reception of the literary text, as a result of going through the literary texts and the exercises applied to the texts, but also the guidance provided by the teacher for each text (noted in the teacher's aids).
In the training classes, they insisted on a deeper analysis of the literary characters, facts and events in the texts, paralleling both the social environment in which the students find themselves at different times of the day, as well as everyone's self.
The research subjects opted for creative or productive responses and because of the way students began to perceive themselves, appreciate themselves, communicate with others, tolerate or relate to others, eliminate prejudices and interact, with examples concrete different characters or events from the studied literary texts.
It was also interested to find out how performed each student from the training group. The comparison of the qualitative indexes, obtained during the administration of the two tests, by the same students of the training group, contained in the tables below, is also relevant.
In the data analysis, we noted with:
• 1 point for the response associated with the reproductive level in receiving the literary text
• 2 points for the response associated with the productive level in receiving the literary text
• 3 points for the answer associated with the creative level in receiving the literary text

The score obtained by each student was collected and presented in the tables below. The data analysis is presented in the appendices of the research

For L.1.F. (grade 4 B, Theoretical High School "Ion Creangă" Chişinău), we obtained the following data:

No. crt.	Initials of the name and first name	Test score 1	Test score 2
2	A.B.	10	18
3	B.D.	9	18
8	C.L.	7	18
11	C.N.	10	18
12	D.L.	10	18
13	D.N.	9	18
17	G.M.	9	18
27	M.R.	9	18
35	Ţ.T.	8	18
38	Z.I.	9	18
1	A.A.	9	19
4	B.L.	11	19
6	B.M.	8	19
9	C.M.	10	19
10	C.M.S.	11	19
15	F.C.	9	19
18	I.A.	10	19
19	L.A.	8	19
21	L.P.	10	19
22	M.A.	11	19
23	M.A.	7	19
24	M.A.	11	19
25	M.A.	9	19
28	M.T.	11	19
30	P.A.	10	19
31	P.M.	11	19
34	T.S.	12	19
36	V.D.	11	19
5	B.L.	9	20
7	C.A.	12	20
20	L.M.	10	20

26	M.B.	9	20
29	N.E.	10	20
32	P.S.	10	20
33	S.S.	8	20
37	V.J.	8	20
14	D.S.	9	21
16	F.C.	14	21

Table 5. Qualitative values of student responses for 1 și T2 L.1.F.

The formative effects of the methods of forming the students' self-image in the process of receiving the literary text, in the 3rd and 4th grades, in the Republic of Moldova and in Romania

An instrument used in the control experiment was a questionnaire to identify the self-image of students aged between 9-11 years.

Method of administration and rating of the questionnaire

The questionnaire is composed of a number of 10 items. Each questionnaire question has a 5-level scale attached. +2.+1.0.-1.-2. In the case of an unfavourable statement, the order of the numerical values is reversed. We present the scoring grid in the following table.

No. crt.	Item	Totally agree	agree	Indifferent	disagreement	Total disagreement
1	I1	+2	+1	0	-1	-2
2	I2	-2	-1	0	1	2
3	I3	-2	-1	0	1	2
4	I4	+2	+1	0	-1	-2
5	I5	-2	-1	0	1	2
6	I6	+2	+1	0	-1	-2
7	I7	+2	+1	0	-1	-2
8	I8	+2	+1	0	-1	-2
9	I9	-2	-1	0	1	2
1	I10	+2	+1	0	-1	-2
Total		**4**				**-4**

Table.6. Scoring grid

In the table below, the students' activity is presented synthetically, within the control experiment, in which the Questionnaire for identifying the self-image of students aged between 9-11 years was applied.

Group of control experiment							
Group	**country**	**school**	**grade**	**Group**	**Total stude**	**Sample type**	**Date of the**

type				type	nts	(control experiment)	control experiment
L.1.F. (training group 1)	Republic of Moldova	Theoretical High School "Ion Creangă" Chişinău	4 B	training	38	Questionnaire	May 2022
L.2. M (control group 2)	Republic of Moldova	Theoretical High School "Ion Creangă" Chişinău	4 D	control	38	Questionnaire	May 2022
L.3.F (training group 3)	Republic of Moldova	Theoretical High School with Sports Profile No.2 Chişinău	3	training	24	Questionnaire	May 2022
L.4. M (control group 4)	Republic of Moldova	Theoretical High School "Ion Creangă" Chişinău	3 D	control	24	Questionnaire	May 2022
L.5.F. (training	Romania	Secondary School	3 A	training	30	Questionnaire	May 2022

group 5)		No. 8 Piatra-Neamt, Neamt county					
L.6. M (control group 6)	Romania	Secondary School No. 3 Piatra-Neamt, Neamt county	3 B	control	30	Questionnaire	May 2022
L.7.F. training group 7	Romania	Secondary School No. 8 Piatra-Neamt, Neamt county	4 A	training	22	Questionnaire	May 2022
L.8. M (control group 8)	Romania	Secondary School No. 3 Piatra-Neamt, Neamt county	4 A	control	22	Questionnaire	May 2022

Table.7. Student activity in the control experiment

The tables with the 3rd and 4th grade students from Romania and the Republic of Moldova, participants in the control experiment, as well as quantitative indices, can be found in the appendices of the research.
The main objectives of the control experiment were:
• Presentation of the dynamics obtained through the qualitative evolution as a result of the application of the techniques of forming the students' self-image in the process of receiving the literary text, in parallel with the control ones (witness)
• Demonstration of the effectiveness of the didactic model, oriented towards the use of the literary text in the process of forming the self-image of the students
• Confirmation of the scientific basis of the hypothesis

• Formulation of general conclusions regarding the effects of the methods of forming the students' self-image in the process of receiving the literary text, in the 3rd and 4th grades.

Following the analysis, it is possible to observe the level of formation of the students' self-image in the process of receiving the literary text, both for the training groups (1,3,5,7) and for the control groups (2,4,6,8), in the control experiment.

In contrast, we analyzed for the Republic of Moldova, at the 4th grades L.1.F. and L.2.M., where we identify the following values, mentioned in the following table:

Republic of Moldova																					
The level	**I1**		**I2**		**I3**		**I4**		**I5**		**I6**		**I7**		**I8**		**I9**		**I10**	
	L.1.F.	**L.2.M**	**L.1.F.**	**L.2.M**	**L.1.F.**	**L.2.M**	**L.1.F.**	**L.2.M**	**L.1.F.**	**L.2.M**	**L.1.F.**	**L.2.M**	**L.1.F.**	**L.2.M**	**L.1.F.**	**L.2.M**	**L.1.F.**	**L.2.M**	**L.1.F.**	**L.2.M**
Totally agree	73.70%	57.90%	0%	0%	0%	0%	68.4%	57.86%	15.8%	7.9%	21.1%	5.3%	73.7%	68.4%	68,5%	60.5%	0%	0.0%	84.2%	78.9%
Agree	18.40%	34.20%	2.600%	2.600%	2.600%	2.600%	31.6%	36.8%	7.9%	18.4%	31.6%	18.4%	26.3%	23.7%	26.3%	31.6%	0%	2.6%	15.8%	18.4%
Indifferent	7.90%	5.30%	0%	2.600%	0%	2.600%	0.0%	5.26%	21.1%	18.4%	15.8%	28.9%	0.0%	2.6%	0%	7.9%	0%	2.6%	0%	0%
Disagree	0%	2.600%	13.20	47.40	13.20	47.40	0.0%	0.0%	21.1%	13.2%	13.2%	7.9%	0.0%	2.6%	2.6%	0.0%	18.4%	15.8%	0%	2.6%

ment			%	%	%	%														
Total disagreement	0%	0%	84.20%	47.40%	84.20%	47.40%	0.0%	0.0%	58.6%	47.4%	18.4%	39.5%	0.0%	2.6%	2.6%	0.0%	81.6%	78.9%	0%	0%

Table. 8. Contrastive aspects of responses to L.1.F. și L.2.M. (4 B and 4D, Theoretical High School "Ion Creangă" Chişinău)

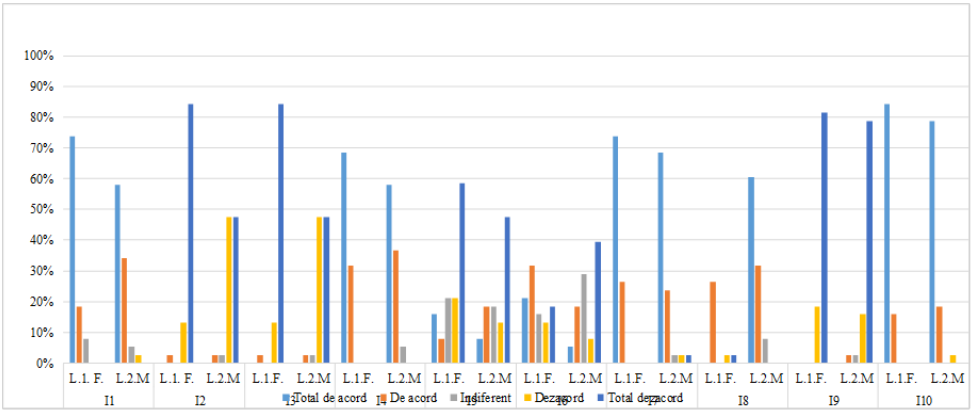

Figure 3. Contrastive aspects of responses to L.1.F. și L.2.M. (4 B and 4D grade, Theoretical High School "Ion Creangă" Chişinău)

In the Republic of Moldova, the 4th grades, L.1.F. and L.2.M., following the analysis of the obtained data, we identify the following aspects:

For item 1: I like to get involved in tasks and take on responsibilities.

A percentage of over 70% of students in L.1. F. they totally agree to get involved in tasks and assume responsibilities, and in the case of L.2.M, the percentage is only 57.90%.In group L.2.M there are 3 students who either disagree with the statement or gave the answer "indifferent"

For item2. I always say "I don't know how to do it".

In the case of the students who studied the optional Read and get to know!, respectively students from L.1.F., a percentage of 84.20%

totally disagree with the statement, unlike L.2.M, where the percentage is only 47.40%.

For Item 3. I am dissatisfied with my own person.

There is a difference of almost 40% between students in L.1.F. compared to those in L.2.M, who are satisfied with their own person

For Item 4. I am proud of my achievements

There is a difference of more than 10% between students in L.1.F. compared to those in L.2.M, who state that they are proud of their achievements.

For Item 5. I avoid getting involved in new tasks.

There is a difference of 11% between students in L.1.F. compared to those in L.2.M, who state that they do not avoid getting involved in new tasks.

For Item 6. Other people's opinion of me matters.

There is a difference of over 15% between students in L.1.F. compared to those in L.2.M, who, after studying literary texts for a school year, according to ELA principles, state that the attitude of others is important for them: how much they feel appreciated, esteemed, accepted or rejected.

For item 7. I offer help and support to other children.

There is a difference of more than 5% between students in L.1.F. compared to those in L.2.M, who offer help and support to the other children

For Item 8. I relate harmoniously with all my colleagues.

There is a difference of over 8% between students in L.1.F. compared to those in L.2.M, who state that they relate harmoniously with all their colleagues

For Item 9. I always say "what's the point of trying anyway I won't succeed", "it's hard", "I'm not able".

There is a difference of almost 2% between students in L.1.F. versus those in L.2.M, who state that they do not agree with this statement.

For Item 10. I always say "I can do this or at least I can try".

There is a difference of more than 5% between students in L.1.F. compared to those in L.2.M, who state that they are trusted to do a certain thing, or can at least try.

In contrast, we analyzed for the Republic of Moldova, at the 3rd grades L.3.F. and L.4.M., where we identify the following values, mentioned in the following table:

Republic of Moldova																				
The level	**I1**		**I2**		**I3**		**I4**		**I5**		**I6**		**I7**		**I8**		**I9**		**I10**	
	L.3.F.	**L.4.M**	**L.3.F.**	**L.4.M**	**L.3.F.**	**L.4.M**	**L.3.F.**	**L.4.M**	**L.3.F.**	**L.4.M**	**L.3.F.**	**L.4.M**	**L.3.F.**	**L.4.M**	**L.3.F.**	**L.4.M**	**L.3.F.**	**L.4.M**	**L.3.F.**	**L.4.M**
Totally agree	54.2%	41.7%	0.0%	4.2%	12.5%	8.3%	58.3%	45.8%	0.0%	16.6%	29.2%	16.7%	41.7%	29.2%	45.8%	33.3%	0.0%	41.6%	54.1%	41.6%
Agree	45.8%	41.7%	0.0%	4.2%	12.5%	16.7%	20.8%	29.2%	4.2%	12.5%	16.7%	20.8%	29.2%	20.8%	25%	29.2%	12.5%	12.5%	33.3%	37.5%
Indifferent	0.0%	12.5%	0.0%	12.5%	12.5%	20.8%	12.5%	25%	25%	16.6%	25%	12.5%	0.0%	29.2%	12.5%	20.8%	8.3%	4.2%	4.2%	20.9%
Disagreement	0.0%	0.0%	25%	12.5%	8.3%	20.8%	0.0%	0.0%	16.6%	20.9%	8.3%	20.8%	12.5%	16.6%	0.0%	16.7%	29.2%	4.2%	4.2%	0.0%
Total disa	0.0%	4.1%	75%	66.6%	54.2%	33.4%	8.4%	0.0%	54.2%	33.4%	20.8%	29.2%	16.6%	4.2%	16.7%	0.0%	50.0%	37.5%	4.2%	0.0%

gr ee m en t																			

Table 9. Contrastive aspects of responses to L.3.F. și L.4.M. (third grade Theoretical High School with Sports Profile No.2 Chişinău and third grade Theoretical High School "Ion Creangă" Chişinău)

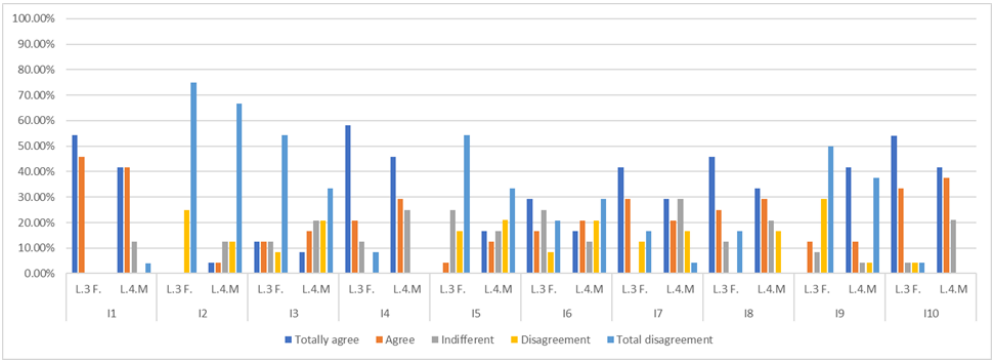

Figure 4. Contrastive aspects of responses to L.3.F. și L.4.M. (third grade Theoretical High School with Sports Profile No.2 Chişinău and third grade Theoretical High School "Ion Creangă" Chişinău)

In the Republic of Moldova, the 3rd grades, L.3.F. and L.4.M., following the analysis of the obtained data, we identify the following aspects:

Item 1: a percentage of over 54% of students in L.3.F totally agree to get involved in tasks and take responsibility, and in the case of L.4.M, the percentage is only 41%.

Item 2. In the case of students who studied the optional Read and get to know!, respectively students in L.3.F., a percentage of 75% totally disagree with the statement, in contrast to L.4.M, where the percentage is only 66%.

Item 3. There is a difference of almost 20% between students in L.3.F. compared to those in L.4.M, who are satisfied with their own person

Item 4. There is a difference of over 13% between students in L.3.F. compared to those in L.4.M, who state that they are proud of their achievements.

Item 5. There is a 19% difference between students in L.3.F. compared to those in L.4.M, who state that they do not avoid getting involved in new tasks.

Item 6. There is a difference of more than 13% between students in L.3.F. compared to those in L.4.M, who, after studying literary texts

for a school year, according to ELA principles, state that the attitude of others is important for them: how much they feel appreciated, esteemed, accepted or rejected.

Item 7. There is a difference of more than 10% between students in L.3.F. compared to those in L.4.M, who offer help and support to the other children.

(1.) Item 8. There is a difference of over 11% between students in L.3.F. compared to those in L.4.M, who state that they relate harmoniously with all their colleagues

(2.) Item 9. There is a difference of more than 12% between students in L.3.F. versus those in L.4.M, who state that they do not agree with this statement.

(3.) Item 10. There is a difference of over 13% between students in L.3.F. versus those in L.4.M, who state that they are trusted to do a certain thing, or can at least try.

In contrast, we analyzed for Romania, in the 3rd grades L.5.F. and L.6.M., where we identify the following values, mentioned in the following table:

Romania																				
The level	**I1**		**I2**		**I3**		**I4**		**I5**		**I6**		**I7**		**I8**		**I9**		**I10**	
	L.5.F.	**L.6.M**	**L.5.F.**	**L.6.M**	**L.5.F.**	**L.6.M**	**L.5.F.**	**L.6.M**	**L.5.F.**	**L.6.M**	**L.5.F.**	**L.6.M**	**L.5.F.**	**L.6.M**	**L.5.F.**	**L.6.M**	**L.5.F.**	**L.6.M**	**L.5.F.**	**L.6.M**
Totally agree	80%	70%	0%	3,33%	0,000%	0,000%	76,666%	66,666%	0,000%	0,000%	46,667%	10%	83,333%	80%	73,334%	66,666%	0,000%	0,000%	93,334%	90%
Agree	20%	26.666%	10%	0%	0,000%	0,000%	16,666%	6,666%	10%	3,333%	10%	3,333%	16,667%	13,333%	26,666%	30%	0,000%	0,000%	6,666%	6,666%
Indiff	0,0	3.3	6,6	10%	0,0	0,0	0.0	26,	0,0	6,6	26,	36,	0,0	6,6	0,0	3,3	0,0	6,6	3,3	0,0

ere nt	%	3 %	6 %		0 %	0 %	0 %	6 6	0 %	6 %	6 %	6 6 %	0 %	6 %	0 %	4 %	0 %	7 %	3 %	0 %
Dis agr eem ent	0 . 0 0 %	0 . 0 0 0 %	2 0 %	3 3 , 3 3 %	6 , 6 6 %	1 3 , 3 3 %	0 . 0 0 %	0 . 0 0 0 %	6 , 6 6 %	2 6 , 6 6 %	1 6 , 6 6 %	2 3 , 3 3 %	0 , 0 0 %	0 , 0 0 0 %	0 , 0 0 %	0 , 0 0 0 %	0 , 0 0 %	6 , 6 7 %	6 , 6 7 %	0 , 0 0 %	0 , 0 0 0 %
Tot al dis agr eem ent	0 . 0 0 %	0 . 0 0 0 %	6 3 , 3 3 %	5 3 , 3 3 %	9 3 , 3 3 %	8 6 , 6 6 %	6 , 6 6 %	0 . 0 0 %	8 3 , 3 3 %	6 3 , 3 3 %	0 , 0 0 %	2 6 , 6 6 %	0 , 0 0 %	0 , 0 0 0 %	0 , 0 0 %	0 , 0 0 0 %	0 , 0 0 %	9 3 , 3 3 %	8 6 , 6 6 %	0 , 0 0 %	0 , 0 0 0 %

Table 10. Contrastive aspects of responses to L.5.F și L.6.M

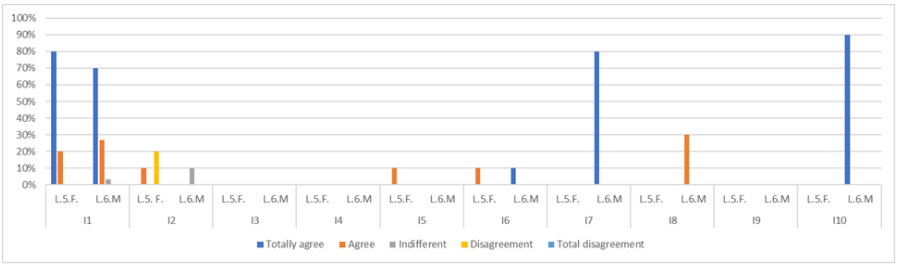

Figure 5. Contrastive aspects of responses to L.5.F și L.6.M

In Romania, at the 3rd grades L.5.F. and L.6.M., following the analysis of the obtained data, we identify the following aspects:

Item 1. A percentage of over 10% of students in L.5.F. they strongly agree to get involved in tasks and take responsibility, compared to students who belong to L.6.M

Item2. A percentage of 10% of students from L.5.F. who studied the optional Read and know!, totally disagree with the statement, compared to the students who belong to L.6.M

Item 3. There is a difference of almost 40% between students in L.5.F. compared to those in L.6.M, who are satisfied with their own person

Item 4. There is a difference of more than 10% between students in L.5.F. compared to those in L.6.M, who state that they are proud of their achievements.
Item 5. There is a 20% difference between students in L.5.F. compared to those in L.6.M, who state that they do not avoid getting involved in new tasks.
Item 6. There is a difference of over 36% between students in L.5.F. compared to those in L.6.M, who, after studying literary texts for one school year, according to ELA principles, state that the attitude of others is important for them: how much they feel appreciated, esteemed, accepted or rejected.
Item 7. There is a difference of more than 6% between students in L.5.F. compared to those in L.6.M, who offer help and support to the other children.
Item 8. There is a difference of over 9% between students in L.5.F. compared to those in L.6.M, who state that they relate harmoniously with all their colleagues
Item 9. There is a 7% difference between L.5.F students. versus those in L.6.M, who state that they do not agree with this statement.
Item 10. There is a difference of more than 3% between students in L.5.F. versus those in L.6.M, who state that they are trusted to do a certain thing, or can at least try.
In contrast, we analyzed for Romania, in the 3rd grades L.7.F. and L.8.M., where we identify the following values, mentioned in the table below:

Romania																				
The level	**I1**		**I2**		**I3**		**I4**		**I5**		**I6**		**I7**		**I8**		**I9**		**I10**	
	L.7.F.	**L.8.M**	**L.7.F.**	**L.8.M**	**L.7.F.**	**L.8.M**	**L.7.F.**	**L.8.M**	**L.7.F.**	**L.8.M**	**L.7.F.**	**L.8.M**	**L.7.F.**	**L.8.M**	**L.7.F.**	**L.8.M**	**L.7.F.**	**L.8.M**	**L.7.F.**	**L.8.M**
Totally agree	45,45%	36,36%	0.00%	0.00%	4,54%	4,54%	77.27%	45.45%	18,18%	4,54%	31,81%	13,63%	59,09%	50%	50%	22,72%	4,54%	0.00%	77,27%	68,18%
Agr	45	31	9,	0.	9,	4,	18	45	9,	4,	18	13	36	36	40	59	0.	0.	22	27

ee	,45%	,81%	09%	00%	09%	54%	.18%	.45%	09%	54%	,18%	,63%	,36%	,36%	,90%	,09%	00%	00%	,72%	,27%
Indifferent	4,54%	31,81%	13,63%	68,18%	9,09%	40,90%	4.55%	9.09%	4,54%	63,63%	18,18%	50%	4,54%	13,63%	4,54%	18,18%	9,09%	50%	0.00%	4,54%
Disagreement	4,54%	0.000%	36,36%	0.000%	13,63%	0.000%	0%	0%	36,36%	0.000%	0,000%	0.000%	0,000%	0.000%	4,54%	0.000%	22,72%	0.000%	0.000%	0.000%
Totaldisagreement	0.000%	0.000%	40,90%	31,81%	63,63%	50%	0%	0%	31,81%	27,27%	31,81%	22,72%	0,000%	0,000%	0,000%	0,000%	63,63%	50%	0.000%	0.000%

Table.11. Contrastive aspects of responses to L.7.F. și L.8.M.

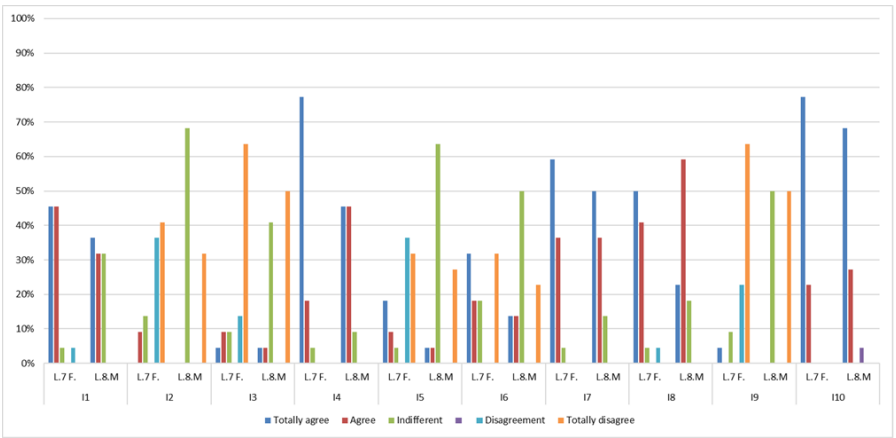

Figure. 6. Contrastive aspects of responses to L.7.F. și L.8.M.

In Romania, the 4th grades L.7.F. and L.8.M., following the analysis of the obtained data, we identify the following aspects:

(1.) For item 1: I like to get involved in tasks and take on responsibilities.

A percentage of almost 10% of students in L.7.F. they strongly agree to get involved in tasks and take responsibility, compared to students who belong to L.8.M

(2.) For item2. I always say "I don't know how to do it".

A percentage of almost 10% of students from L.7.F. who studied the optional Read and know!, totally disagree with the statement, compared to students who belong to L.8.M

(3.) For Item 3. I am dissatisfied with my own person.

There is a difference of almost 14% between students in L.7.F. compared to those in L.8.M, who are satisfied with their own person

(4.) For Item 4. I am proud of my achievements

There is a difference of over 30% between students in L.7.F. compared to those in L.8.M, who state that they are proud of their achievements.

(5.) For Item 5. I avoid getting involved in new tasks.

There is a difference of more than 4% between students in L.7.F. compared to those in L.8.M, who state that they do not avoid getting involved in new tasks.

(6.) For Item 6. Other people's opinion of me matters.

There is a difference of 18% between students in L.7.F. compared to those in L.8.M, who, after studying literary texts for one school year, according to ELA principles, state that the attitude of others is important for them: how much they feel appreciated, esteemed, accepted or rejected.

(7.) For item 7. I offer help and support to other children.

There is a difference of over 9% between students in L.7.F. compared to those in L.8.M, who offer help and support to the other children.

(8.) For Item 8. I relate harmoniously with all my colleagues.

There is a difference of more than 25% between students in L.7.F. compared to those in L.8.M, who state that they relate harmoniously with all their colleagues

(9.) For Item 9. I always say "what's the point of trying anyway I won't succeed", "it's hard", "I'm not able".

There is a 13% difference between L.7.F students. versus those in L.8.M, who state that they do not agree with this statement.

(10.) For Item 10. I always say "I can do this or at least I can try".

There is a difference of over 9% between students in L.7.F. versus those in L.8.M, who state that they are trusted to do a certain thing, or can at least try.

Results

The principles of ELA, which were the basis of the study of the literary text with the aim of forming the students' self-image, generated the following characteristics in the affective sphere, in the desirable sphere, in the volitional sphere, in the evaluation sphere.

Reported to each individual item, the following conclusions will be generated:

C1. When he gives himself enough value, the child achieves his goals more easily because if he has confidence in himself, in his own forces, this makes him mobilize exactly the resources he needs to overcome obstacles and go in the desired direction.

C2. The child accepts himself, appreciates himself for what he does well (self-respect and self-confidence), accepts that he has weaknesses without constantly criticizing himself for them (tolerance towards himself and towards others).

C3. If the inner voice tends towards negative, pessimistic speech, self-critical, with unfulfilled ambitions for perfection, the self-image is negative.

C4. Between self-appreciation and self-criticism, there must be a balance, neither extreme is effective. The child who constantly brags risks being ridiculed, excluded from the group, abandoned by the other colleagues, and the one who makes exaggerated self-criticism generates feelings of pity, guilt or even superiority, attracting other criticism.

C5. Children who underestimate themselves are emotional. Internalize, sensitive I prefer to be in the center of attention to get the appreciation of those around me, they are insecure and always dissatisfied.

C6. Self-image is often supported or sabotaged by external factors. Though this is the mirroring in one's own consciousness. Children who do not have a good self-image or those who have not strengthened their self-image, they constantly need to relate to the outside. Success makes them feel good, and failure breeds excessive blame. When the child accepts his qualities as well as his flaws, when there is a good self-image, external reality confirms or disproves what he already knows about himself, helping him to improve if necessary. The attitude of others is important for the child: how much he feels appreciated, esteemed, accepted or rejected.

C7. Groups formed by colleagues, friends, family, exert different influences on the child's self-image. Considering the fact that one of the factors on the basis of which the self-image is formed is the relation to the group. Parents are the first to plant inside children the basis of

the value system to which they will relate when they are adults, when they will outline their self-image.
C8. If he has a good self-image, the child can achieve his goals, positive self-image generating enthusiasm, energy and determination, obstacles being perceived as challenges that must be overcome in order to achieve the proposed objectives.
C9. A negative self-image causes the child to decrease his motivation, annihilating it through a lack of self-confidence.
C10. It denotes the fact that he has a good self-image, because the child has a realistic belief about himself, through a correct conception of his capabilities but also of his weaknesses.
The obtained results exactly confirm the hypothesis as well as the specifics of the experimental operation, this being demonstrated by the results obtained by the students in the experimental classes, compared to the control ones. The change is caused by the use in the formative experiment of experiential methods of developing interest in reading, as a result of the application of ELA principles in the teaching-learning process, of optimizing the exposure of post-reading impressions, of facilitating the research of the literary text by referring to aspects that concern the affective sphere, the desirable sphere, the volitional sphere, the evaluation sphere as well as the conceptual sphere.
The methodology of forming the students' self-image in the process of receiving the literary text, focuses on the pedagogical and psychological benchmarks, using:

- Means: an optimal use of temporal, material and human resources.
- Methods: active, experiential
- Strategies: education focused on interactive activities, adjusted by the components of self-image: Real Self, Future Self and Ideal Self
- Objectives: formative.

The methodology of forming the students' self-image in the process of receiving the literary text, becomes functional by integrating it into the didactic paradigm of literary-artistic education, at the primary education level.
The pedagogical experiment was carried out in real conditions, in three distinct stages: observation, training and evaluation.
The results of the pedagogical experiment allow the finding that the level of self-image formation of the students in the experimental classes increased considerably in relation to the level of the self-image formation of the students in the control classes. This confirms the

validity of the research hypothesis as well as the effectiveness of the methodology of forming the students' self-image in the process of receiving the literary text.

Paul Cornea, in the work "Introduction to the theory of reading", quoting Eduard Claparède says: „for an adult who knows the mechanics of the written language, the letter is simpler than the syllable, the syllable simpler than the word. But this is not the case at all for the child who sees a written text for the first time. For him the word or even the phrase forms a picture whose general physiognomy captivates him more than the isolated letters which he does not distinguish as a whole."

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PERCEIVED IMPACTS OF PLANNING AND ORGANIZING OF LEARNING ENVIRONMENT ON ENTREPRENEURIAL EDUCATION IN OSUN STATE UNIVERSITY

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Abstract: *Persistent unemployment issue in the country demands a drastic solution from all stakeholders in Nigeria project. This study examined the perceived impacts of planning and organizing of learning environment for entrepreneurial education in Osun State University (UniOsun). The participants comprised 300 undergraduates drawn randomly from three of the six campuses of UniOsun. A well modified instrument was used for data collection. The findings revealed that the content delivery of entrepreneurial education programme in UniOsun was well delivered in terms of equipping students with skill of recognition of opportunity, networking skills and making professional contacts, and creativity; but less adequate with reference to enhanced leadership and communication skills and equipping students to become independent problem solvers. well valued in the society, others felt otherwise Besides, students' perceptions of the relevance of entrepreneurial education programme for job creation was poor; but less supportive in terms of limited number of instructors for training programmes, and lacking in creative development of students. Hence, it was recommended, among others, that the school management should increase the level of attention paid to the entrepreneurial areas that were perceived to be inadequately delivered in UniOsun.*

Keywords: *Entrepreneurial Education; Learning Environment; Perceived Impact; Planning; Organizing; UniOsun*

Introduction

Concept of Learning Environment

Learning environment can be defined as an educational approach, cultural context, or physical setting in which teaching and learning occur. It is typically reffers to the context of educational philosophy or knowledge experienced by students and may also encompass a variety of learning cultures; its presiding ethos and characteristics, how individuals interact, governing structures, and philosophy in learning style and pedagogies used and the societal culture of where the learning is occurring (Biggs, 2003). It also includes such factors as operational characteristics of the instructors, instructional group, or institution; the philosophy or knowledge experienced by the student. Students learn in various ways and under variety of settings, most times within school settings and sometimes outside-of-school locations and other outdoor environments (Lei, 2010). There is infinite number of possible learning environments, which is what makes teaching so interesting.

Learning environment can be learner-centred, knowledge-based, on assessment-level or even community-driven (Çubukçu, 2012). In the past, most learning experiences occurred in the traditional classroom setting where the teacher *talk and chalk* and students *look, listen and dump board notes* on, but with the advent of information and communication technology, modernized classrooms and learning experiences began to surface (Brooks,2010). Modern learning environment is an alternative to unlimited traditional connotations in which there is the symbolic room, rows and column of desks, cane, chalkboard and rickety facilities for teaching-learning processes. In the 21st century, students' learning environment focuses on students attaining deep understanding and out-of-classroom knowledge to be able to cope. Learners do the learning with the sole aim of creating a total environment for learning that optimizes the ability of students to learn (Linda, Nilson & Barbara, 2005).

More precisely, in the traditional learning environment, teachers do the talking while student do the listening, but times has changed now, teachers are no longer seen as the "*sage on the stage"* but a "*guide on the side*". The era of rote learning (*memorisation of learned information and idea*) is over, teachers are now expected to facilitate while students are seeing, carrying out the problem-solving tasks which are essential to learning (Abrami, D'Apollonia, & Rosenfield,

2007). In the contrary, there is no single optimum learning environment as it varies from classroom to classroom and context to context. According to Brooks (2010), there are different types of learning environments such as face-to-face, online, and hybrid with varying characteristics and peculiarities. It is worthy of note that learning activities go beyond physical institutional arrangement of laboratories, library, classrooms and teaching theatres, it encompasses characteristics of learners, aims, objectives and goals of teaching and learning activities, contents of learning, strategies, assessment strategies, plans and procedures and other ephemerals that promote the teaching-leaning experiences (Cabrera, Colbeck, & Terenzini, 2001). Hence, developing a complete and holistic leaning environment is a great task and most creative aspect of the teaching experience.

Entrepreneurial Education

UNESCO/ILO (2006) defines entrepreneurship education as collection of formalized teachings that informs, trains, and educates anyone interested in participating in socio- economic development through a project to promote entrepreneurship awareness, business creation, or small business development. It is usually conceived as seeking to foster self- esteem and confidence by drawing on the individual's talents and creativity, while building the relevant skills and values that will assist students in expanding their perspectives on schooling and opportunities beyond. It focuses on the development of skills or attributes that enable the realization of opportunity (Wei, Liu & Sha, 2019), and seeks to provide students with the knowledge, skills and motivation to encourage entrepreneurial success in a variety of settings. Variations of entrepreneurship education are offered at all levels of schooling from primary through graduate university programmes. It is a training scheme to develop persons for self-employment or for organizing, financing or managing an enterprise (Wang, Ellinger & Wu, 2013), a process of equipping students (or graduates) with an enhanced capacity to generate ideas and the skills to make them happen (Volery, Mueller, and von Siemens, 2015). In simple terms, it is the ability to create and build something practically from nothing such that the builder and risk taker is willingness to take calculated risks and then do everything possible (Kettunen, Kairisto-Mertanen, and Penttilä, 2013).

It is without doubt that an entrepreneurship-focused education helps students to develop crucial life skills that will serve them well beyond the classroom walls (Chen and Chang, 2014). There are various methodologies which are based on the use of personal,

behavioural, motivational, attitudinal and career planning activities (Fillis & Rentschler, 2010). An entrepreneur is the risk-bearer and works under uncertainty. It consists of three core elements which are creativity (creating all kinds of ideas), innovation (find the value in selected ideas) and entrepreneurship (develop a business from the innovative idea).

Impacts of Planning and Organizing Learning Environment

The import of un-managed population of the Nigerian society has continued to creep into the school system. This has given rise to the study of learning environment and its' effect on cognitive achievement, creative assessment and entrepreneurship education has been debated and research for many years and yet inconclusive (Adeyemi, 2006). The prevailing conditions in Nigeria education system imply that learning opportunities in Nigerian schools differs as students in urban schools have more educational opportunities than their ounterparts in rural learning environment. Thus, an organised and planned learning environment prepares students to be responsible and enterprising as well as helps to develop skills, knowledge, and attitudes necessary to achieve the goals they set out for themselves (Balogun, 2010). An unplanned learning environment is not conducive for the new waves in the teaching-learning process as most standardized materials, contents and assessment tools have lost value as it conditioned students and learning to a straight-jacketed approach (Fareo, 2013).

It has been frequently witnessed that a planned and organised learning environment avails all and sundry the room for diversity, creativity, innovation, collaboration and other skills needed to solving personal and societal problems. Some studies have shown positive impacts while others negative influence of learning environment on the students' learning outcomes. For instance, Adediwura and Bada (2007) attributed students'academic performance to learning environment. A learning environment located in a rural area, they argue, will have all the characteristics of rural environment; similarly, an urban learning environment will have an environment-based activities peculiar to its environment but different from a rural location. Thus, as learning environment differs, the level of academic performance may also differ. The consequence is that the quality of education may not be even; and the National policy of education for a democratic, egalitarian society may not be attained equally.

By the same token, one of the impacts of planning and organising learning environment is to prepare students for

the future. In the contemporary society, the unprecedented global and technological transformations have created a likelihood that by 2055, all jobs available now and before then would be taken over by automated machines (Guay, Chanal, Ratelle, Marsh, Larose & Boivin, 2010), creating completely new roles, responsibilities, and challenges for the future workforce. Thus, the need for planning and organising learning contents and environment around complex global, social, and environmental issues in the future is not negotiable. Hence, entrepreneurship-focused programmes teach students crucial life skills such as problem-solving, teamwork, empathy to help them navigate this uncertain future as well as learning to accept failure as a part of the growth process.

Besides, students need to learn how to identify problems before they learn how to solve them. Chen and Chang (2014) remarked that problem-solving has been taught in schools for decades, but the same cannot be said for problem identification. Traditionally, problem-solving is taught by presenting students with issues that are already clearly defined by someone else. Gianesini, Cubico, Favretto and Leitão (2018) submited that in the real world, problems can only be solved when they have been properly identified and described. In a planned and organised learning environment, entrepreneurship education teaches children to identify problems they have never encountered before which is a rare skill that is valuable for the future. A planned and organised learning environment develops in learner the confidence and grit to dear. Grit consists of passion and sustained persistence applied toward long-term achievement (Ispir, 2010). The demanding and uncertain entrepreneurship journey requires more passion and sustained persistence than most other activities. This makes an entrepreneurship-focused programme ideal for developing grit in your students.

For instance, class size is one of sub-variables of learning environment. Adeyemi (2008) defined class size as an educational tool that can be described as an average number of students per class in a school, while (Kornfeld, 2015) described it as the number of students per teacher in a class. A lot of argument has gone on the impact of class size on performance, some fingering over-bloated class size as the main factor responsible for falling standard of education, most especially in the elementary or secondary level of education in Nigeria.

They submit that as class size increases so student's achievement decreases. A study by Miller, Rycek and Fritson (2011) on the effects of high impact learning experiences on student engagement, it was said that student engagement includes skills

engagement, participation engagement, emotional engagement, and performance engagement. Handlesman et al., (2005) created a questionnaire (SCEQ) which measures these forms of engagement. It was discovered that the undergraduate research and internships promotes greater student engagement with key factors contributing to engagement included perceived career relevance, faculty/student collaboration and the focus and intensity of the learning experience.

According to this perspective, Audretsch, Kuratko, and Link (2016), the extent to which learning experience is considered to be of *high-impact* depends on the student's perception of his/her experience, not on any empirical measurement of success. Along similar lines, a sound learning environment helps to impart and promote the pillar of entrepreneurship (Brian and Norma, 2010). In the same vein, entrepreneurs seek to solve problems, meet needs, and ease pain points with the help of their products and services. They are hard-wired to make a difference and make the world a better place. Every student can benefit from entrepreneurship-focused education because participating in entrepreneurship programmes, they are made ready to create their own futures as well as change the world (Gianesini, Cubico, Favretto, and Leitão, 2018).

Various entrepreneurial education studies have been carried out on in the area of curriculum development, individual traits, ability, behavioural intention, mechanism for innovation, development strategies, interest, framework, learning environment among other factors (Anderson, Potočnik, and Zhou, 2014). Bacigalupo et al (2016) designed a framework for entrepreneurship education which they also called entrepreneurial competence and considered three key steps which are opportunity identification, entrepreneurial skills, and actions. Galloway and Brown (2002) also found out that the knowledge of entrepreneurship education is capable of changing students' attitudes toward entrepreneurship. In the same vein, students' perception and attitudes toward entrepreneurship education can determine whether students' creativity will be expressed and constitutes a self-judgment of one's perceived competence in generating novel ideas (Brown and Ulijn 2004; Beghetto and Kaufman, 2010), forming an internal, lasting, and stable innovative personality.

Also, students' views on their entrepreneurship education are related to their perception of innovation; fostering innovation through entrepreneurship education is the primary task of universities. Awareness and ability are the core process of students' innovation activities, which are also influenced by innovation personality. The

educational system of universities has to provide an academic environment that may serve as a catalyst for high-technology start-ups (Franke and Lüthje, 2004). If learners are constantly challenged to expand their content knowledge they will be motivated to broaden their cognitive levels (Bandura, 1999), form a defense mechanism to eliminate the negative impact caused by perceived pressure (Granieri et. al., 2017). Entrepreneurs are made, not born, by imparting the knowledge and skills needed for a new business venture. The process of shaping the ability of student entrepreneurs is a social interaction process in which information resources are acquired and transformed in the form of observation or direct participation

Psychological Implications of Good Learning Environment for Entrepreneurship Education

Nigeria as a nation has experienced a steady decline since the oil windfall peaked more than twenty years ago with slow growth and rapidly rising population have yielded dramatic increases in poverty. She has been on a roller coaster in the decades since independece, culminating in a long period of stagnation following the apex of the petroleum boom. The problems of flagging growth, rising poverty, and widening inequality arise from several factors, including an unfavorable economic structure, detrimental policies, adverse political conditions, unemployment and negative external shocks (Odia and Odia (2013). Nigeria's population has a large percentage of young inhabitants, and there is a high demand for educational opportunities for its young populace. After severe cuts in governmental aids following a nationwide recession in 2016, Nigeria's underfunded higher education system became the focus of ongoing student protests and strikes. This has given mental and psychological torture to all and sundry.

In 2019, the estimated youth unemployment rate in Nigeria was at almost 20 percent which is according to the data estimates from the International Labour Organization, an agency of the United Nations developing policies to set labor standards (Kassean, Vanevenhoven, Liguori, and Winkel, 2015). This is the situation and is hitting deep into the fabric of the Nigerian society with every stakeholder having their fair share. Government at all levels has dissipated efforts in fora, conferences, seminars, policy meetings to stem the tide. The option of adopting and incorporating entrepreneurship education into the education system rigmarole the best means to curtail unemployment in Nigeria (Odia and Odia, 2013). Across the world, entrepreneurship education has been recognized as part of school curriculum but with variations at the

levels of education and even nations. It is been offered based on human competences and abilities to develop which is in tune with the main pedagogical goals pursued in each age and maturity level of education.

In Nigeria and many parts of the world, entrepreneurship education has been adopted as a way of developing skills such as risk-taking and problem solving that facilitate achievement of life goals and create jobs (Premand, Brodmann, Almeida, Grun, and Barouni, 2016). It encourages creativity, innovation, and collaboration as well as places premium on students' involvement in the teaching-learning situation as they learn better when given responsibility to carry out independently or in collective bargain. Though, human beings respond to experiences and learn from them, modern learning experience depicts a holistic and interdisciplinary approach which built around principles and practices that expressly ensure that the learning journey is enjoyable, engaging, relevant, and informative (Gundry, Ofstein and Kickul, 2014).

In a learner-friendly environment, the most important thing for teachers is to view learners as competent and strong rather than needy and weak (Granieri, Marca, Mannino, Giunta, Guglielmucci and Schimmenti (2017). Psychological make of every learner is wired to be natural researchers, curious to know more about something. In the 21st century, a lounge-like learning environment captures an inviting space with colourful interior and high- technology equipment for individual or small group exercises, on-the-job mentoring and learning networks, whether formal or informal allow learners to bounce questions and ideas off one another, creating learning experiences that foster memory-ability (Fillis and Rentschler, 2010). Information shared is information repeated, and repetition increases retention. The learning environment is expected to build the needs of various learners through enabling the use of multiple channels in learning situations and not the other way round like we have nowadays. The moment that is jettisoned, the one-way approach makes teaching- learning process boring and exhaustive which may not be too good for creativity and innovation which is the hallmark of entrepreneurship education.

Hence, to encourage entrepreneurial success at diverse settings, the main objective of providing students with attitudes, knowledge and skills for entrepreneurial action must be put into onsideration. Skills development is essential for increasing the productivity and sustainability of enterprises and improving working conditions and the employability of workers. In order to navigate into the labour market, young individuals need the technical skills to perform

specific tasks as well as core work skills: learning to learn, communication, problem-solving and teamwork.

More importantly, they need positive attitude towards imbibing and applying the core values/ skills of entrepreneurial education at the labour market. According to Ajzen (2002), in his theory of planned behavior, attitude towards something is one of the key factors that determine the extent people would develop interest in and subsequently execute or carry out such behaviour. Unfortunately, the existing research in this area, especially in Nigeria, has not detailed how well the recently introduced entrepreneurial education, have equipped graduates with required skills and attitudes needed to become autonomous thinkers and problem-solvers in this rapidly increasing technological-driven labour market. Hence, this study aims to examine the role of effective planning and organizing of learning environment as a catalyst for driving entrepreneurial education objectives in tertiary institutions. The extent that the current entrepreneurial education programme has equipped Nigerian youngsters with relevant skills needed to become job creators, not job seekers, will as well be investigated.

Research Questions

1. What are students' perceptions of the content delivery of entrepreneurial education programmes taught in Osun State University (UniOsun)?
2. What are perceptions of the relevance of entrepreneurial education programme taught in Osun State University?
3. Are existing learning environments supportive and adequate for entrepreneurial education programme taught in Osun State University**?**
4. What are perceived value of entrepreneurial education skills among undergraduate students in Osun State**?**
5. Are there significant differences in the perceived relevance of entrepreneurial education programmes taught in UniOsun based on student's gender?

Methods

Research Design

This research adopted a survey research design. Survey research design is a popular design in education which requires researchers to administer a survey/questionnaire to a selected sample or the entire population of people, to describe the attitudes, opinions, or characteristics of the population (Creswell, 2008). This research design

helps researcher to describe trends about pattern of responses to research questions or hypotheses (Creswell, 2008).

Participant

The target population of this study comprised all undergraduate students in Osun State University (UniOsun). There are six cognate campuses in UniOsun (two in each of the three senatorial districts of the state). Specifically, three campuses (one from each of the senatorial zones) were selected. They included Ikire, Ipetu-Ijesa and Osogbo campuses. Thereafter, a simple random sampling technique was applied to select 100 participants from each campus. Altogether, a total of 300 respondents constituted the sample size of this study.

Instrument

This study used modified-adapted instrument for data collection. The instrument consisted of four sections. Section "A" dealt with respondent's demographic information; section "B" consisted of items on entrepreneurial education skills taught in tertiary institutions and their relevance for self-reliance of undergraduates; section "C" comprised items on quality of learning environment required for entrepreneurial education; while section "D" contained items on perceived value of entrepreneurial skills among undergraduates. All items were measured on a 5-point Likert like scale, ranging from "1" equals "Strongly Disagree" to "5" equals "Strongly Agree". For convenience and ease of presentation of results, the responses for strongly disagree and disagree options were collapsed as "Disagreed", and that of agree and strongly disagree were collapsed as "Agreed". Prior to the collection of main study data, concerted efforts were made to ensure the psychometric properties of the instrument (i.e., the validity and reliability estimates) were carefully and adequately established, using both Cronbach's alpha reliability statistics and exploratory factor analysis approach.

Method of Data Analysis

The data responses were analyzed using Statistical Package for Social Science (SPSS) software, version 23.0. Upon screening and scrutinizing the data, descriptive and inferential statistics via percentage analysis, frequency count, mean/standard deviation, and independent t-test were deployed for data analyses.

Data Analysis and Results

Descriptive Analysis of the Participants

As indicated in the method section, this study drew participants from three campuses of UniOsun. They included both male and female students with an average age of 19 years. The students were in different levels of study (from 100L – 600L). Altogether, a total of 300 students participated in the study but only 261 provided usable data. Table 1 presents the participants' demographic variables and usable responses from the survey.

			Sample Size	
S/No	**DEMOGRAPHIC**	**GROUPS**	**N = 261**	**(%)**
1.	**GENDER**	MALE	113	43.3
		FEMALE	148	56.7
		TOTAL	**261**	**100**
2.	**PROG. OF STUDY**	EDUCATION	100	38.4
		ARTS/HUMANITY	90	34.5
		ENINEERING	18	6.8
		PURE & APPLIED SC.	53	20.3
		TOTAL	**261**	**100**
3.	**AGE**	15 – 20YRS	141	54.0
		21 – 25YRS	110	42.1
		26YRS & Above	10	3.8
		TOTAL	**261**	**100**
4.	**LEVEL OF STUDY**	100	56	21.5
		200	96	36.8
		300	53	20.3
		400	51	19.5
		500	04	1.5
		600	01	0.4
		TOTAL	**261**	**100**
5.	**PARENT'S PRESENT OCCUPATION**	PRIVATE SECTOR	49	18.8
		PUBLIC SECTOR	96	36.8
		SELF-EMPLOYED	93	35.6
		UNEMPLOYED	04	1.4
		RESTIRED	19	7.3
		TOTAL	**261**	**100**
6.	**PARENT'S YEARLY INCOME**	10,000 - #100,000	53	20.3
		101,000 - #200,000	35	13.4
		201,000 - #300,000	78	29.9
		301,000 - #400,000	28	10.7
		401,000 - #500,000	14	5.4
		#501,000 & above	53	20.3
		TOTAL	**261**	**100**

Table 1: Frequency distribution of participants' demographic characteristics

As shown in table 1, the participants of this study comprised 113 male (43.3%) and 148 female (56.7%) students; with a larger percent (54%) falling in the 15-20 years age category, followed by 21-25 years (42.1%), and 26 years old and above (3.8%). A greater percent of the participants (38.4%) belonged to Education programme, followed by Arts/Humanity (34.5%), Pure and Applied Science (20.3%), and Engineering (6.8%). About 36.8% of the participants were from 200 Level of study, 21.5% were in 100 Level, 20.3% in 300 Level, 19.5% in 400 Level, 1.5% in 500 Level, and only 0.4% in 600 Level. A greater percent of the participants' parents (36.8%) worked in the public sector, followed by those who were self-employed (35.6%), 18.8% worked in the private sector, 7.3% were retirees, while 1.4% was unemployed. On the aggregate, many of the participants' parents (63.6%) earned a yearly income of #10,000 - #300,000, while only about 36% of them earned #301,000 and above income yearly.

Research Question One:

What are students' perceptions of the content delivery of entrepreneurial education programmes taught in Osun State University (UniOsun)?

Descriptive statistical analyses (via frequency count, percentage analysis and measure of central tendency and dispersion) were conducted to determine the participant's views about content delivery on entrepreneurial education programme in UniOsun. The outcomes of the analyses are displayed in table 2 below.

	Disagreed		Undecided		Agreed			Std.
Variables	**N**	**%**	**N**	**%**	**N**	**%**	**Mean**	**Dev**
Recognition of opportunity	51	19.5	14	5.3	196	75.1	3.9	1.3
Creativity	63	24.1	29	11.1	169	64.7	3.4	1.7
Problem solving skills	71	28.7	25	8.1	165	63.2	3.3	1.8
Leadership and communication skills	92	35.2	39	14.9	130	49.8	2.7	1.8
Development of new products and services	49	18.8	37	14.2	175	67.0	3.7	1.5
Networking skills, and making professional contacts	50	19.2	33	12.6	178	68.2	3.7	1.6

Tab. 2: Frequency distribution of the participants' views of content delivery on entrepreneurial education programme in UniOsun

The outcome of data analysis on content delivery of entrepreneurial skills taught in Osun State University (as displayed in table 1 above)

revealed a mixed reaction. On one hand, a vast majority of the respondents (75.1%, 68.2%, 67.0%, & 64.7% respectively) felt some key entrepreneurial skills, such as recognition of opportunity, networking skills and making professional contacts, development of new products and services, and creativity, were well delivered and mastered by students. On the other hand, some negligible percents (35.2% & 28.7%) disagreed that the content delivery of entrepreneurial education programme would enhance their leadership and communication skills, as well as get them equipped to become independent problem solvers.

Research Question Two:
What are perceptions of the relevance of entrepreneurial education programme taught in Osun State University?
To determine the students' perception of the relevance of entrepreneurial education programme taught in UniOsun, descriptive statistical analyses were conducted. The outcomes of the analysis are presented in table 2 below.

	Disagreed		Undecided		Agreed			Std.
Variables	**N**	**%**	**N**	**%**	**N**	**%**	**Mean**	**Dev**
I am ready to do anything to be an entrepreneur	160	61.3	20	7.6	81	31.0	2.2	2.1
I will make every effort to start and run my own business	145	55.5	29	11.1	87	33.3	2.4	2.0
I am determined to create a business venture in the future	152	58.2	35	13.4	74	28.3	2.0	2.2
My professional goal is to be an entrepreneur	167	63.9	39	14.9	55	21.1	1.9	2.2

Tab. 2: Analysis of perceived relevance of entrepreneurial education programme in UniOsun

The outcome of data analysis on perception of relevance of entrepreneurial education programme in UniOsun (table 2) revealed that the participants held low view of the relevance of entrepreneurial education programme. For instance, only a lesser proportion of the participants (33.3%, 31.0%, 28.3%, and 21.1% respectively) believed in the ultimate goal of entrepreneurial education programme and were ready to do anything to be an entrepreneur; would make every effort to start and run own business; were determined to create a business venture in the future; and have professional goal to be an entrepreneur. On the other hand, greater percents of the participants (more than half

e.g., 63.9%, 61.3%, 58.2%, and 55.5% respectively) disagreed with the potential values of entrepreneurial education programme highlighted above.

Research Question Three:

Are existing learning environments supportive and adequate for entrepreneurial education programme taught in UniOsun**?**

Descriptive statistical analyses were conducted to determine if the existing learning environments in UniOsun were supportive and adequate for entrepreneurial education programme. The outcomes of the analyses are displayed in table 3 below.

	Disagreed		Undecided		Agreed			Std.
Variables	**N**	**%**	**N**	**%**	**N**	**%**	**Mean**	**Dev**
My school environment:								
encourages creative devpt. of students	156	59.8	19	7.3	86	32.9	2.4	2.0
has adequate facilities for skill training programmes	100	38.3	42	16.1	119	45.6	2.6	1.8
has adequate number of instructors for various skill training programmes	159	60.9	16	6.1	86	32.9	2.3	2.0
has capacity for large nos of participants in skill training programmes	65	24.9	49	18.8	147	56.3	3.6	1.8
Our programmes are anchored by well-experienced instructors	84	32.2	35	13.4	142	54.4	3.2	1.9

Tab. 3: Supportiveness and adequacy of learning environments for entrepreneurial education

The outcome of data analysis on how supportive and adequate are learning environments for entrepreneurial education programme in UniOsun (as displayed in table 3 above) revealed a mixed reaction. While some percentage of the respondents agreed that the learning environments were supportive and adequate for entrepreneurial education programme, others felt otherwise. For instance, some reasonable proportions (56.3%, 54.4%, & 45.6% respectively) were of the views that the learning environment in UniOsun has capacity for large number of participants in skill training programmes, the entrepreneurship education programmes are anchored by well-experienced instructors, and the learning environment has adequate facilities for skill training programmes. Yet, other participants (60.9%, and 59.8% respectively) disagreed about the supportiveness and adequacy of the learning environments, in terms of adequate number of instructors for various skill training programmes, and whether the environment encourages creative development of students.

Research Question Four:
What are perceived value of entrepreneurial education skills among undergraduate students in Osun State**?**
To determine the perceived value of entrepreneurial education skills among undergraduate students in UniOsun, descriptive statistical analyses were conducted. The outcomes of the analysis are presented in table 4 below.

	Disagreed		Undecided		Agreed			Std.
Variables	**N**	**%**	**N**	**%**	**N**	**%**	**Mean**	**Dev**
My immediate family values entrepreneurial activity above other activities and careers	51	19.5	14	5.3	196	75.1	3.9	1.3
The culture in my country is highly favorable towards entrepreneurial activity	63	24.1	29	11.1	169	64.7	3.4	1.7
The entrepreneur's role in the economy is highly valued in my country	71	28.7	25	8.1	165	63.2	3.4	1.3
My friends value entrepreneurial activity above other activities and careers	167	63.9	39	14.9	55	21.1	1.9	2.2
Most people in my country consider it acceptable to be an entrepreneur	50	19.2	33	12.6	178	68.2	3.7	1.6
In my country, entrepreneurial activity is viewed to be worthwhile, despite the risks	145	55.5	29	11.1	87	33.3	2.4	2.0
My colleagues value entrepreneurial activity above other activities and careers	152	58.2	35	13.4	74	28.3	2.0	2.2
It is commonly thought in my country that entrepreneurs take advantage of others	160	61.3	20	7.6	81	31.0	2.2	2.1

Table 4: Perceived value of entrepreneurial education s
kills among undergraduates in UniOsun

Like the previous analysis on table three, the outcomes of data analysis for perceived value of entrepreneurial education skills among undergraduate students in UniOsun revealed a mixed feeling result. While some proportion of respondents perceived entrepreneurial education programme to be well valued in the society, others were of the contrary views. For instance, some 75%, 68%, 64% and 63% respectively were of the views that their immediate family values entrepreneurial activity above other activities and careers; most people in their country consider it acceptable to be an entrepreneur; the culture in their country is highly favourable towards entrepreneurial activity; and entrepreneur's role in the economy is highly valued in their country. Yet, other participants (64%, 61%, 58% & 55%, respectively) disagreed that their friends value entrepreneurial activity above other activities and careers; that entrepreneurs take advantage of other professionals in their country; their colleagues value entrepreneurial activity above other activities and careers; and that entrepreneurial activity is considered to be worthwhile, despite the risks.

Research Question Five:
Are there significant difference in the perceived relevance of entrepreneurial education programmes taught in UniOsun based on student's gender?
To address the fifth research question, an independent t-test statistical analysis was conducted. The result of the analysis is presented on table 5 below.

								95% Confidence Interval	
Variable	**Group**	**N**	**Mean**	**Std. Dev.**	***T***	**Df**	***p***	**Lower**	**Upper**
Gender	Male	113	44.2	5.4	0.03	158	0.969	-2.16	2.25
	Female	148	45.1	5.7					

Tab. 5: Differences in the perceived relevance of entrepreneurial education programmes between male and female undergraduates in UniOsun

The differences in the perceived relevance of entrepreneurial education programmes among undergraduate students in UniOsun (based on gender) were tested using independent sample t-test analysis. The results (table 5) showed no statistically significant difference in the mean scores for males ($M = 44.2$, $SD = 5.4$) compared with females ($M = 45.1$, $SD = 5.7$), $t\ (158) = 0.03$, $p = 0.969$. Thus, the result was inconclusive. This tends to suggest that regardless of the sex group of the undergraduates in UniOsun, the perceived relevance of entrepreneurial education programmes was viewed in a similar way. That is, both male and female students were not too different in the way they perceived the relevance of entrepreneurial education programmes.

Discussion

The central objectives of this research were in multiple folds, including: Determining the students' perceptions of the content delivery of entrepreneurial education programmes in UniOsun, the perceived relevance of the programme, the supportiveness and adequacy of learning environment in UniOsun for the programme, the perceived value of the programme among undergraduates in Osun State University, as well as differences in the perceived relevance of the programme between male and female students in UniOsun. In line with the above objectives, the following findings were obtained and discussed.

Finding for the first research question revealed a mixed reaction. While some resounding proportion of the respondents felt some key entrepreneurial skills taught in UniOsun were well delivered and mastered by students, other negligible percent held contrary views on the issue. The aspects perceived to be well delivered and mastered by students included skill of recognition of opportunity, networking skills and making professional contacts, development of new products and services, and creativity; while the aspects such as enhanced leadership and communication skills, as well as equipping students to become independent problem solvers were perceived to be inadequately delivered. These results align with previous findings. If learners are constantly challenged to expand their content knowledge they will be motivated to broaden their cognitive levels, and form a defence mechanism to eliminate the negative impact caused by perceived pressure (Bandura, 1999; Granieri et al., 2017).

Secondly, our finding revealed that the participants held low view of the relevance of entrepreneurial education programme. The results indicated that a greater proportion of the participants did not believe in the ultimate goals of entrepreneurial education programme and were not ready to do anything to become an entrepreneur; nor make effort to start and run a business; nor determine to create a business venture in the future. This means they did not attach much weight to nor believe in the necessity of entrepreneurial education for job creation. This result is however contrary to the findings of previous studies. Wang, Ellinger and Wu (2013) highlighted the need for entrepreneurial education to include developing persons for self-employment or for organizing, financing or managing an enterprise; and equipping students (or graduates) with an enhanced capacity to generate ideas and the skills to make them happen (Volery, Mueller, & von Siemens, 2015).

Besides, the outcome of data analysis for research question three revealed a mixed reaction. While some percentage of the respondents agreed that the learning environments were supportive and adequate for entrepreneurial education programme, others felt otherwise. For instance, some proportions of the participants were of the views that the learning environment in UniOsun has capacity for large number of participants in skill training programmes, the entrepreneurship education programmes are anchored by well-experienced instructors, and the learning environment has adequate facilities for skill training programmes. Yet, other participants disagreed about the supportiveness and adequacy of the learning environments, in terms of adequate number of instructors for various skill training programmes, and whether the environment encourages creative development of students.

The role of learning environment for effective teaching-learning process has been stressed in the previous studies. According to Ispir (2010), in a planned and organised learning environment, entrepreneurship education teaches students to identify problems they have never encountered before, and develops in learner the confidence and grit to dear. Grit consists of passion and sustained persistence applied toward long-term achievement. Reflecting on the dissenting view above, it is possible that the instructors engaged for the programme are well-experienced but the number is grossly inadequate. Hence, this may result in low perception of the relevance of the programme.

Likewise, the outcomes of data analysis on perceived value of entrepreneurial education skills among undergraduate students in UniOsun revealed a mixed feeling result. While some proportion of respondents felt that entrepreneurial education programme was well valued in the society, others were of the contrary views. For instance, some participants felt that members of their immediate family value entrepreneurial activity above other activities and careers; most people in their country consider it acceptable to be an entrepreneur; the culture in their country is highly favourable towards entrepreneurial activity; and entrepreneur's role in the economy is highly valued in their country. This outcome is in congruence with the common notion of positive impact of entrepreneurship education across societies. According to Premand, Brodmann, Almeida, Grun, and Barouni (2016), entrepreneurship education has been adopted as a way of developing skills such as risk-taking and problem solving that facilitate achievement of life goals and create jobs. It encourages creativity, innovation, and collaboration as well as places premium on students' involvement in the teaching-learning situation. However, other participants disagreed that their friends and colleagues value entrepreneurial activity above other activities and careers; that entrepreneurs take advantage of other professionals in their country; and that entrepreneurial activity is considered to be worthwhile, despite the risks.

Last but not the least, the difference in the perceived relevance of entrepreneurial education programmes among undergraduate students in UniOsun (based on gender) was tested using independent sample t-test analysis. The results (table 5) showed no statistically significant difference between males and females. Thus, the result was inconclusive. This tends to suggest that regardless of the sex group of the undergraduates in UniOsun, the relevance of entrepreneurial education programmes was viewed in a similar way. That is, both male

and female students were not too different in the way they perceived the relevance of entrepreneurial education programmes.

Summary of Findings

The content delivery of entrepreneurial education programme in UniOsun was perceived to be well delivered in terms of equipping students with skill of recognition of opportunity, networking skills and making professional contacts, development of new products and services, and creativity; but less adequate with reference to enhanced leadership and communication skills and equipping students to become independent problem solvers. Besides, students' perceptions of the relevance of entrepreneurial education programme were poor, which denoted that they attach little or no weight to the necessity of entrepreneurial education for job creation. More so, the learning environment for entrepreneurial education programme in UniOsun was perceived to be supportive and adequate in terms of space capacity for large number of participants in skill training programmes, well-experienced instructors, and adequate facilities for skill training programmes; but less supportive in terms of limited number of instructors for various skill training programmes, and less adequate for creative development of students. Furthermore, while some respondents felt that entrepreneurial education programme was well valued in the society, others were of the contrary views. Lastly, the male and female participants were not significantly different in their views of the relevance of entrepreneurial education programmes taught in UniOsun.

Conclusion

Based on the findings discussed above, it can be concluded that entrepreneurial education programmes taught in UniOsun is capable of producing skillful entrepreneurs among graduate students. Although, some caveats must be highlighted as potential hindrances to the above goal. These include need to make learning environment more friendly and supportive for the programme, engage adequate number of instructors for the programmes; as well as look into ways the programme can be more supportive to enhance leadership and communication skills, and equipping students to become independent problem solvers. In this regard, non-gender discriminatory measures will work out well in attempt to further improve both content delivery and learning environments used for the programme in UniOsun.

Recommendations

1. The school management should increase the level of attention paid to the entrepreneurial areas that were perceived to be inadequately delivered in Osun State University (UniOsun).
2. Students should be orientated on the relevance of entrepreneurial education programme and the need to harness it for a better career and financial future.
3. The government at all levels should intensify efforts towards the provision of resources necessary for embracing quality entrepreneurial lifestyle activities among students.

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FROM CHAO TO CLARITY: TRANSFORMING LEARNING WITH GRAPHIC ORGANISERS FOR IMPROVED SECONDARY SCHOOL STUDENTS ACADEMIC PERFORMANCE IN ICT

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Abstract: *A graphic organiser is one of the teaching methods that can assist learners to organize information, structuring the information and relating the concept to another. Secondary school students perceived computer networks as one of the difficult concepts in computer studies. This study examines the potency of graphic organisers in learning computer networks in the newly implemented ICT curriculum in Nigeria. This study employed a quantitative research approach. The data collected was analysed with ANCOVA with pre-test scores as the Covariate. The results from the study reveal that students in the experimental*

group performed better than their counterparts in the control group due to the intervention they had. Thus the results show that there is a significant difference in the performance of students taught computer networks using the two methods- graphic organisers and lecture method irrespective of their gender. This study is unique because it relies on the testing of visual and graphical representations of contents in reducing the hitches in the study of computer networks which justifies the adoption of the graphic organisers in learning ICT.

Keywords: *Graphic Organiser, Information, Communication and Technology, Academic performance, Computer Networks*

Introduction

To raise generations that can think critically, make the right decisions at the appropriate time and find solutions to difficult situations in life requires equipping them with the appropriate and significant teaching-learning pedagogical skills rather than exposing them to ready-made materials for memorization (Tureniyazova, 2019). To accomplish this pedagogical skill, effective teaching and learning strategies require technologies that must instil in the learners' ability to analyse the educational information that is received to solve specific problems. According to See (1994), technology involves the act of generating knowledge that assists in solving problems. It helps in changing the way people access, gathers, analyse, present and simulate information (Ghavifekr, et al., 2012)

Technology in this 21st century has become important to all fields most especially in education. It is now seen as the best knowledge transfer medium in most of countries in the world. (Ghavifekr & Rosdy 2015). Using technology in education these days has gone through a lot of innovations which has changed the way people live, reason and do things now (Jiang & Grabe 2007). As a result of this, all schools and institutions need to prepare students through the integration of technology into their curriculum.

The integration of Information, Communication and Technology (ICT) in the secondary school curriculum is to make teaching and learning more technology-based which will allow students to learn through the utilisation of technology within and outside the school environment. Since students now have access and they are familiar with technology, they will learn faster and easier within the technology-based environment (Ghavifekr & Rosdy 2015). ICT being a subset of

technology is one of the subjects newly introduced to the Nigeria school curriculum in the last few years. This is justified by global trends and growing awareness with the intent to positively influence the teaching-learning process and promotes national development. (Dias & Atkinson, 2001).

Studies have shown that ICT plays an important role in student's academic performance as it could be used for effective instructional delivery in schools (Adesina et.al 2014; Ghavifekr & Rosdy 2015; Valverde-Berrocoso, et al., 2022). ICT has the capacity of bringing real-life situations into the classroom setting which was cannot done in a traditional class setting. This is because it provides the learners with the opportunities to interact and collaborate (Baytak, et al., 2011). In Nigeria, it is generally believed that basic ICT skills are essential for students to access information that is needed to write external examinations through online platforms (Agbo, 2015). These imply that, without having basic ICT knowledge students may not gain admission into higher institutions (Basri et al. 2018).

The application of ICT knowledge and skills has become a critical part of the teaching-learning process. ICT skills can assist in facilitating student-centred learning (Drent, 2005). However, despite its benefits to society generally and considering its advantages to teaching and learning in this 21st century, secondary school students still perceived some concepts difficult in ICT (Gbeleyi et.al 2022). A Plethora of studies confirmed that students' poor performance in ICT can be attributed to a lack of ICT facilities, limited financial resources, students' attitudes towards learning and most importantly ineffective teaching methods (Okorie & Agah 2014, Wabwoba 2019, and Atandi, et al.; 2019). Premised on this fact, Owolabi and Okebukola (2009) agreed that the methods of teaching employed play significant roles in students' learning ability.

Students' academic performance in this context is described as the systematic improvement of the student's current state of knowledge and the level to which such knowledge can reflect the skills acquired in the internal and external examinations. Student's academic performance is also the development of their personality and academic growth from lower to higher levels of study. To improve the learner's academic performance, traditional methods which are teacher-centred with no learners activities should be discouraged (Noor et.al. 2020). Onowugbeda, et al, (2022), opined that the traditional method deprives students of the opportunity to engage in hands-on activities using technological tools and relevant instructional resources which would have promoted students' academic performance in the subject and improved their attitude to learning.

Despite the importance of ICT and other ICT-related subjects to bring meaningful learning and advancement in technology which can shift the paradigm from a teacher-mediated method to a student-mediated method (Odekeye et al. 2023). It's still appalling to note that students' academic performance in ICT at all levels remains very poor (Okeji et al., 2020). This informed that alternative pathways could be explored to ease the problem of poor academic performance in ICT through graphic organisers.

Graphic organisers are communication tools for visual displays used by teachers to give information in a way that facilitates the understanding and learning of the information. (Meyen, 1996). According to Woolley (2010), graphic organisers give significant structure to information that cannot be disseminated in the traditional written form but through visual representation. Hall and Strangman, (2002) believe that graphic organisers are visual representation that show connections among facts, figures terms and ideas within a learning task. The visual representation of textual information provided by graphic organisers makes it easier to assimilate the information. They allow learners to delve deeply into the core of the concepts, examine the concepts and understand the relationships to construct an algorithm to solve the problem. Learners can cultivate a creative imagination, form various associations, and come up with unique ideas with or without any assistance because graphic organisers are mapping techniques used to facilitate learning when limited time is given with a large amount of information to work with (Praveen & Premalatha, 2013).

The concept of the graphic organisers was also derived from Ausubel's assimilation theory of cognitive learning, as stated by Zaini et al., (2010). According to them, the information is structured in a hierarchical pattern by the mind, moving from the most relevant to the least relevant. The goal of the cognitive method of teaching and learning is to get an understanding of how information coming in is processed and organised in the memory.

According to Ausubel (1963), the use of graphic organisers has a significant impact on learning because it gives learners a meaningful framework within which they can integrate previously acquired knowledge with newly acquired information. Students are provided with a tool that allows them to arrange the content, identify crucial concepts, and concentrate on the most relevant information through the use of graphic organisers (Knight et al. 2001). Clark (2007) further posited that graphic organisers does not only allow learners sort information, but also assist them to understand difficult concepts, singly generate thoughts, and identify connections between ideas generated. In addition, graphic organisers give learners more control

over the text they are reading and help them better comprehend it (Farris 2001), Graphic organisers are instructional tools that facilitate learners to search for information and arrange those information and concepts to relate with new concepts. (Owolabi & Adaramati, 2015).
Studies have shown that teaching can be assisted effectively and efficiently with graphic organisers to improve students' academic performance (Robillos 2023; Sharma, 2012; Praveen & Premalatha, 2013; Kumar-Manoj & Rizwaan, 2013). Odewumi & Gambari, (2019) also confirmed in their study that graphic organisers had been effectively used to improve the academic performance of students in subjects like Mathematics (Mercer & Miller, 2003; Githua & Nyabwa (2008), Science subjects (Condidorio, 2010), Writing (Jasmine & Weiner 2007), Home Managements (Alshatti, et al., 2012), & Health Education (Kools et al., 2006). The use of graphic organisers also benefited students with learning disabilities. (Dexter & Hughes, 2011).

1. Why Computer Networking?

A survey study was conducted by Okebukola et al. (2020) as cited by Awah et al., (2022) to investigate concepts perceived as difficult in the new computer studies curriculum among secondary school students in Africa (Nigeria and Ghana). 1501 (male=734, female=767) computer studies students participated in the study. Nigeria and Ghana were selected because the two countries used the same computer studies syllabus for West Africa Senior School Certificate Examinations. The study revealed that computer networking was ranked one of the most difficult among the 19 concepts perceived as difficult by students. Therefore, the researcher's interest in this study is to find out how to use graphic organisers to ease the difficulties experienced by computer studies students in Nigeria in computer networks.

2. The study sought to provide answers to these questions:

i. Will there be any significant difference in the academic performance of students taught computer networks with graphic organisers and the lecture method?
ii. Will there be any significant difference in the academic performance of male and female students taught computer networks using graphic organisers and the lecture method?

2.1 In line with the purpose of the study, two hypotheses were generated to guide this study:

i. There is no statistically significant difference in the students' academic performance taught computer networks using graphic organisers and lecture methods.

ii. There is no statistically significant difference in the students' academic performance taught computer networks using graphic organisers and lecture methods based on gender.

Theoretical Framework

The theories and studies conducted by Ausebel on advance organisers formed the foundation upon which graphic organisers were built. It was proposed by Ausebel (1963) that a student's pre-existing knowledge, which is termed "cognitive structure" exerts a significant amount of effect on the student's ability to acquire new information. Learning takes place when an individual's cognitive structure is expanded by the incorporation of new information. Students are provided with the foundation for linking prior knowledge to newly acquired material through the use of visual organisers, which helps to make this process more manageable (Ausebel, 1963). Another cognitive theory that supported using graphic organisers in facilitating learning and retaining information is the Schema theory. Schema theory states that memory is composed of a network and that a schema is described as knowledge that is structured to facilitate the mental process. Winn and Snider (1996) described the characteristics of the schema theory as follows: 1. A schema is a well-organised structure that exists, is combined with other schemas in memory and has the sum of an individual's knowledge. 2. A schema is made up of links and nodes that explain the connections between node pairs. 3 Information that is general rather than specific is used to create a schema. 4. Schema provides contexts that help determine how new experiences are interpreted. Schema theory is where graphic organisers have their roots. Students need to be able to remember new information they learn to use it later (Dye 2000).

3. Method. Research Design

In this study, a quasi-experimental research design was adopted without randomization at the time of data collection. It involves one experimental and one control group with a pre-test and post-test non-equivalent group design. Both groups were exposed to the same pretest to assess their baseline abilities before the treatment. Graphic organisers were the teaching strategy used to teach the experimental group computer networks while the control group was taught the same topic via the traditional method. The two groups were exposed to post-tests after the treatment. Figure 1 Illustrations of qua-experimental research design for the two groups (As illustrated in Figure 1)

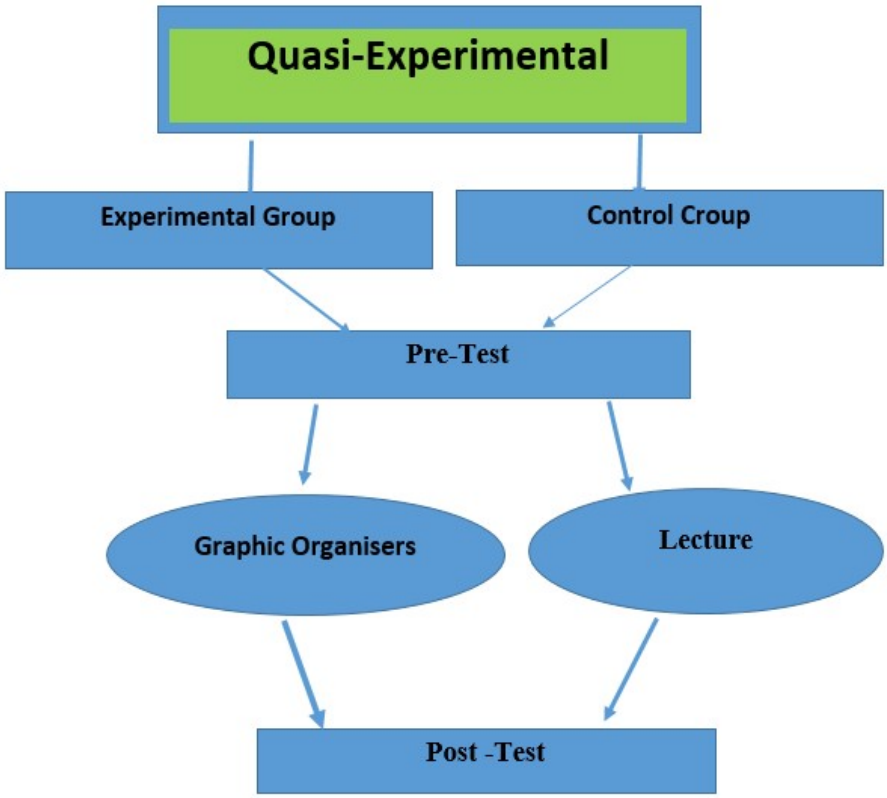

Figure 1: Showing the representation of experimental group and control group method

4.1 Population and sampling

This population is made up of all computer studies secondary school students in Education District V, Ojo Zone of Lagos State. Two public senior secondary schools were selected as the sample. This was because of two reasons. Presently, public schools have more equipped computer laboratories than private schools in Lagos State, Nigeria. This is because the government is now seeing the importance of ICT in national development. Most computers in public secondary schools are now connected to the internet in Lagos state, which was needed for teaching computer networks.

The total number of participants in this study was one hundred and five (105). Fifty-five (29 males and 26 females) students in the SS2 formed the experimental group while fifty (26 males and 24 females) students in the SS2 class formed the control group. Thus, the sample for the study was made up of students of mixed abilities, ages and genders.

4.2 Instrument

A self-developed instrument titled Computer Network Achievement Test (CNAT) was used for data collection. The questionnaire has two sections (A and B). The items in the instrument were taken from WASSCE past questions (2014–2020) and approved secondary school computer studies textbooks. The multiple-choice items assessed student performance. Computer studies teachers in Senior Secondary Schools with years of experience verified it. Teachers who coordinated and marked WASSCE were also considered for instrument validation. These respected persons were chosen to guarantee that the items' structure matched the scope, correctness, and logical presentation of the lesson plans' behavioural objectives. These efforts validated the instrument. Language specialists helped make the items unambiguous, grammatical, and ambiguity-free. Test-retest determined instrument reliability. The instrument was given to thirty-five (35) students who were not part of the respondents in the study. Each student's answer booklet was assessed for accuracy. After two weeks, the researchers administered the test again to the same set of students. The responses from the first and second administrations of the instrument were exposed to stability testing after collation. The reliability coefficient was r=.88. This indicates that the study instrument was reliable since the acceptable level is $r \geq 0.7$.

The experimental group and control group were given a pre-test to set a baseline prior to the treatment and a post-test using the same instrument. Afterwards, each group enjoyed the teaching methods assigned to the group to teach the topic “Computer Networks”.

The experimental group were taught computer networks using graphic organisers and adopted the following procedures as treatment

Step 1: The teacher uses a sample of a concept map to explain the computer network. This map contains to display the connections, through Wi-Fi or broadband, of the computers in a network.

Step 2: Students were guided on to how identify features of the concept map that can be seen in the classroom, such as a WI-FI router.

Step 3: Students state new vocabulary on the concept map and will generate their definitions based on their online research. Access.

Step 4: Students then generate their concept map using their definitions of new terms

Step 5: The class explores the variety of definitions used in the mind maps and will create a class set of definitions for key computer network terms

	Levene - test	df1	df2	Sig.

The control group were taught computer networks using the lecture method and adopted the following procedures
Step 1: The teacher briefly introduced computer networks to the students and gives various definitions of computer networks.
Step 2: The teacher supports the students in their understanding of computer network concepts.
Step 3: The teacher gives types and examples of computer networks.
Step 4: The teacher asks questions on the computer network.
Step 5: The teacher goes over the lesson again by laying emphasing on the salient points.
Immediately after the completion of the lessons. The teacher administered the achievement test (CNAT) to the two groups.
ANCOVA analysis was used on the post-test and the pre-test data.

Gender	**Graphic Organisers**		**Lecture Method**		**Total**	
	N	(%)	N	(%)	N	(%)
Male	29	52.7	26	52	55	52.3
Female	26	47.3	24	48	50	47.6
Total	55	100.0	50	100.0	105	100.0

4. Results

Table 1. Analysis showing gender and teaching strategy for the control and experimental groups

Table 1 shows the number of male students and female students in the graphicorganisers and lecture method groups. Population, normality, variance homogeneity and random assignment were the basic parametric assumption that are met before the data collected were analysed using analysis of covariance.

		Levene-test	dfl	df2	Sig.
Post-Achievement	Mean	.45	1	103	.51
	Median	.41	1	103	.53
	Median and with adjusted df	.41	1	82.25	.53
	trimmed mean	.65	1	103	.42
Pre-Achievement	Mean	.01	1	103	.92
	Median	.01	1	103	.92
	Median and with adjusted df	.01	1	99.04	.92
	Trimmed mean	.01	1	103	.92

Table 2: Analysis of Test of Homogeneity of Variances

Table 2 shows that both post-achievement and pre-achievement scores measures were not statistically significantly different. This confirmed that the variance between the groups is equal and passed the test of homogeneity of variance.

Research question one: Is there a significant difference in the academic performance of students taught computer networks using graphic organisers and lecture methods?

		N	Mean	Standard Deviation
Post – Achievement	Graphic	55	14.00	1.83
	Control	50	9.94	1.32
	Total	105	12.17	2.59
Pre – Achievement	Graphic	55	5.38	2.14
	Control	50	5.84	2.03
	Total	105	5.60	2.09

Table 3: Mean of graphic organisers and lecture method groups

From Table 3: Students' achievement mean scores before the administration of treatment for the control group (M = 5.84) which was higher than the experimental group (M = 5.38). However, after the administration of the treatment, the mean score of the experimental group (M = 14.00) became higher than the control group (M = 9.94).

Hypothesis one: There is no statistically significant difference in the students' academic performance taught computer networks using graphic organisers and lecture methods.

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	955.48[a]	2	477.74	42.52	0.00
Intercept	1509.71	1	1509.71	134.38	0.00
Pretest-Achievement	.01	1	.01	0.00	0.98
Group	944.47	1	944.47	**84.07**	0.00
Error	1145.91	102	11.23		
Total	15094.00	105			
Corrected Total	2101.39	104			
Note: R Squared=.455 (Adjusted R Squared =0 .444)					

Table 4: ANCOVA Table Showing Post-test Achievement with Pre-test Achievement as Covariate

Table 4 shows that the pre-test achievement of the P-value is 0.00. This shows that students in graphic organisers and lecture method groups have different initial entry levels, which is what the Pretest intended to achieve. The ANCOVA brings all the students to the same baseline.
The result from the analysis of covariance showed no statistically significant difference in the academic performance of students taught computer networks using graphic organisers and those taught with lecture methods (**F (1,102) = 84.07; P<0.05).** Thus hypothesis one then is **REJECTED**.

Research question two: Is there a significant difference in the academic performance of male and female students taught computer networks with graphic organisers and the lecture method?

Gender	Mean Scores	Standard Deviation	N
Male	11.20	4.81664	55
Female	11.04	4.15987	50
Total	11.1238	4.49507	105

Table 5: Mean and Standard Deviation of Male and Female Students in Graphic Organisers and Lecture method groups

Mean scores of students in the experimental group (11.20) and the control group (11.04) based on their gender, which shows no statistically significant difference.

Hypothesis two: there is no statistically significant difference in the students' academic performance taught computer networks using graphic organisers and lecture methods based on gender.

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	12.507[a]	2	6.253	.305	.738
Intercept	1828.062	1	1828.062	89.264	.000
Pretest_Achivement	11.836	1	11.836	.578	.449
Gender	1.495	1	1.495	.073	.788
Error	2088.884	102	20.479		
Total	15094.000	105			
Corrected Total	2101.390	104			
NOTE	**A. R Squared = .006 (Adjusted R Squared = -.014)**				

Table 6: ANCOVA Table Showing Students' Gender on Posttest Achievement and Pretest Achievement as Covariate

Table 6 shows a statistically significant difference in the academic performance of students taught computer networks using graphic organisers and lecture methods based on gender as **(F (1,102) =0.07; p>0.05)**. Thus hypothesis two is then **NOT REJECTED.**

5. Discussion

The first hypothesis finds out whether "there is no statistically significant difference in the students' academic performance taught computer networks using graphic organisers and lecture methods". The results show a statistically significant difference in the performance of those taught computer networks using graphic organisers and lecture method, thereby rejecting the null hypothesis. The finding from this study support the potency of the graphic organisers in enhancing the teaching and learning of computer networks than using lecture method. This finding agrees with the other studies by Pantziara et al (2009); Butler, et al, (2003); and Witzel et al., (2003)) which also provided evidence attesting to the efficacy of graphic organisers in promoting the students' academic performance. Also, the result agrees with the finding of Van Gelder, (2007) who agreed that visual displays enhance learning as it has positive impact on students' academic achievement

since the experimental group performed better than their counter in the control group. However, the finding did not support that of Baxendell (2003) and Egan (1999) who believed that the usage of graphic organisers in the teaching will make students become tangled and disorgansed in understanding some concepts.

The second hypothesis is that "there is no statistically significant difference in the students' academic performance taught computer networks using graphic organisers and lecture methods based on gender". The result revealed that there is no statistically significant difference between the academic performances of students based on gender; thus the hypothesis was not rejected.

Our findings agree with the studies of Githua and Nyabwa (2007); Zollman (2006) and Odewumi and Gambari, (2019). Their studies found that there is no statistically significant difference in the academic performance of students taught with graphic organisers based on gender. This also concur with the results of (Foxworthy, 1995; Manning, 1998) where they found out that all students benefited equally irrespective of their gender when graphic organisers were used to teach concepts in mathematics. However, our result did not concurs with that of Owolabi and Adaramati, (2015) because they found significant differences in the academic performance of male and female students. The intervention seemed to be more favourable to male students than the female students.

Generally, this study has shown that the use of graphic organisers motivates the student to learn faster. Students find computer networks more exciting and interesting to learn with the use of graphic organisers. The findings also reveal that gender has no bearing in the academic performance of the students Thus, graphic organisers should be integrated into the teaching and learning of ICT concepts.

6. Conclusion

This study's findings showed that graphic organisers are more effective in teaching and learning computer studies when compared to the lecture method which is a common method used by teachers for many years. Quasi-experimental was used to test the two hypotheses in this study (i.) no significant difference in the students' academic performance taught computer networks using graphic organisers and lecture methods. (ii.) no significant difference in the students' academic performance taught computer networks using graphic organisers and lecture methods based on gender.

In this study, the result of comparing graphic organisers and the lecture method using ANALYSIS OF COVARIANCE showed significant results *[F (1,102) = 84.07; P< 0.05]*. This shows a statistically

significant difference in the academic performance of the experimental group and control group. This implies that the experimental group was significant which implies that graphic organisers are a better model to adopt for teaching effectively in order to enhance the students' understanding of computer networks as one of the difficult concepts in computer studies.

This study also revealed that statistically, there is no significant difference in the academic performance of male and female students taught computer networks using the methods. [$F\ (1,102) = 0.07;\ P>0.05$]

Finally, these findings have shown the effective use of graphic organisers in teaching computer networks at secondary school levels and this need to be adopted in order to increase the academic performance of learners at both internal and external examinations.

7. Recommendations

The researchers recommended as follows:

1. Teachers should be encouraged and trained to use graphic organisers in teaching of computer studies and other ICT - related concepts.
2. Government should train teachers through seminars, conferences and workshops on the importance of using graphic organisers in schools.
3. There should be an Educational Resources Centre (ERC) by the Ministry of Education across the country where visual instructions would be made for teachers to purchase.
4. Further research or studies should be made to address the barriers or challenges facing teachers on the use of graphic organisers in their daily classrooms in schools.

8. Ethical consideration

There was an approval from the appropriate authorities of the schools used —principals of public schools —was requested in order to conduct the study in those schools. Every participant were asked to sign a consent form located on the answer booklet, the research team ensured that there was an agreement with everyone to take part in the study. The participants informed about the goals of the study and were all given the assurance that all their responses would be kept private and used for only for research. They were also made to understand that participation in the research is voluntary and that participants have the right to leave the study at any time, for any reason. In addition to this all the respondents were not physically or psychologically hurt or abused while participating in the study.

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9.2 Funding
The authors received no financial support for this study
9.3 Data Availability
Data will be made available on request.

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ANALYSIS OF DIFFERENTIAL ITEM FUNCTIONING OF NATIONAL EXAMINATIONS COUNCIL AGRICULTURAL SCIENCE MULTIPLE CHOICE TEST ITEMS IN SOUTH EAST, NIGERIA

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Abstract: *The study examined the differential item functioning of National Examinations Council (NECO) Agricultural Science multiple choice test items (2015-2017) in South East Zone. The study adopted descriptive survey research design and ex-Post-Facto research design. Two null hypotheses were formulated and test in the study. The population of the study consisted of 10, 194 Agricultural Science students. Sample size of 728 Agricultural Science Senior Secondary School students (SSS III) were proportionately drawn from the 72 selected secondary schools that constituted the sample size of the study. A multi-stage sampling technique was used for the study. The instrument used for data collection was NECO paper III questions constructed in 2015-2017.The instrument was re-validated by experts in Educational Measurement and Evaluation and Agricultural Extension Education. The data obtained was analysed using Kuder Richardson Formular 20 with reliability indices of 0.76. Data obtained for the study were analyzed using the Scheuneman modified Chi-square statistic to analyze all the research questions and chi-square statistic was employed in testing the null hypotheses. Results showed that that Agricultural Science multiple-choice test items used in NECO 2015-2017, contain test items that significantly*

functioned differentially for testees on the basis of gender and that there was no significant difference between male and female students on the percentage of items which functioned differentially in the 2015-2017 NECO Agricultural Science multiple choice test examination. It was thus recommended among others that test experts and developers should consider the use of Scheuneman modified chi-square in determining differential item functioning.

Keywords: *Differential Item Functioning, National Examinations Council, Agricultural Science*

Introduction

Agriculture is the production of food, feed, fibre and other goods by the systematic growing and harvesting of plants and rearing of animals. Agriculture is at the heart of our daily life, vital to the economy and society. Agricultural sector plays a strategic role in the process of economic development of a country. It has already made a significant contribution to the economic prosperity of advanced countries and its role in the economic development of less developed 2 countries especially Nigeria is of importance. Much emphasis is placed on the teaching of Agricultural Science especially at the Secondary School level because of its classification as a vocational subject in the National Policy on Education (FRN, 2013).

Several strategies are used in the teaching and learning of Agricultural Science. Some of these strategies as put by Eze (2012) are the use of field trips for teaching of Agricultural Science, demonstration and practical Agricultural Science teaching and provision of adequate text books to students. In addition to these strategies, seminar and workshops have been organized by several bodies such as Science Teachers' Association of Nigeria in the use of modern teaching strategies in teaching Agricultural Science at secondary school level of education (Ikwuakam, 2008). Despite different strategies recommended for promoting teaching and learning Agricultural Science in secondary schools, the performance of students is not encouraging.

The available evidence, however, revealed that, out of 16,200 candidates who sat for the National Examinations Council (NECO) examinations in Agricultural Science in 2014/2015, only 17% of these numbers respectively, had credit level pass. In 2015/2016, a total of 41,080 candidates sat for Agricultural Science, only 13% had credit level pass respectively. In 2016/2017, a total of 17,984 candidates sat

for Agricultural Science, only 15% had credit level pass respectively (NECO Chief Examiner Report, 2017; State Statistics Unit of National Examinations Council, Umuahia, 2017).

The persistence of poor performance in Agricultural Science may be attributed to the use of non-valid and unreliable instrument which may be biased against some of the group of examinees with equal ability (Ojerinde, Popoola & Onyeneho, 2012). Therefore, test items used for examination should be fair to the examinees irrespective of the groups, management, supervision, class size and so on, but if the test items used for examination favour particular groups of examinees and disfavour their counterpart of equal ability, it implies that there are presence of differential item functioning (DIF). According to Ihechu (2019), a test item is described as differentially functioning when the probability of correct response is not the same for all examinees of a given ability irrespective of their group membership. Therefore, DIF arises when two groups of equal ability levels are not equally able to correctly answer an item (Queensoap & Orluwene, 2019).

Many research findings in Nigeria have shown that there are always differences in the performance between examinee from gender and school location (Njoku, 2006; Okpala, 2010, Olutola, 2011, Okeke, 2016, Olutola, 2016a, Olutola, Ihechu & Nuraddeen, 2022).

Gender is the range of physical, mental, and behavioral characteristics pertaining to, and differentiating between, masculinity and femininity. Obinne and Amali (2014) revealed that there was a significant difference in the differential item functioning of items in the Biology examinations of NECO and WAEC. Similarly, Adedoyin (2010), in his study investigated gender biased items in public examinations, and found that out of 16 items that fitted the 3PL item response theory statistical analysis, 5 items were gender biased. Madu (2012) revealed that items significantly function differentially by gender for male and female examinees in 39 items and 11 items did not exhibit DIF. School location (urban/rural) in which a child finds himself/herself goes a long way to determine one's academic achievement in life.

Moreover, Olutola, Ihechu and Nuraddeen (2022) reported no significant difference between male and female students on the percentage of items which functioned differentially in the 2020 Basic Education Certificate Examination (BECE) mathematics multiple choice test examination. The result of their finding also showed that mathematics multiple-choice test items used in BECE 2020 examinations, contain test items that significantly functioned differentially for testees on the basis of school location. In addition, Mokabi and Adedoyin, (2014) reported on the existence of differential item functioning between urban and rural school students. Inyang

(2014) reported that rural students performed better than their urban counterparts. In addition, Olutola (2016b) revealed the calculated t-value of 6.89 which is significant at 0.05 alpha level. The result also showed that urban students' had a higher mean of (24.92) and higher standard deviation (11.80) than the mean (20.59) and standard deviation (9.89) for the rural students'. These results indicate that students from urban schools performed better than students' from rural schools in NECO SSCE multiple choice Biology test. Therefore the present study examined whether there are differences in the performance of males and females students in Agricultural Science external examinations within their school location.

Statement of the Problem

A test is supposed to measure examinees ability or other traits of interest irrespective of certain factors such as gender, ethnicity, geographical location and school types. In other words, a test item by standards is supposed to be invariant in nature. This view is in line with IRT position on test items. This is not always the case for psychometricians who have often found some test items to have interactions with the characteristics of the sample (examinee). Differential item functioning is of a particular concern to tests of Agricultural Science subject in students' academic achievement.

There is the need for research in identification of DIF in test items used in measurement of Achievement in Agricultural Science. This study therefore, assessed test items that are biased in respect to gender and school location in Agricultural Science of National Examinations Council multiple choice test items for 2015-2017 in South East Zone, Nigeria.

Purpose of the Study

The purpose of the study was to assess test items that are biased in respect to gender and school location in Agricultural Science of National Examinations Council multiple choice test items for 2015-2017 in South East, Nigeria. Specifically, the study sought to find out:

-1 percentage of items in the 2015-2017 NECO Agricultural Science multiple choice test items functioned differentially by gender.

-2 percentage of items in the 2015-2017 NECO Agricultural Science multiple choice test items functioned differentially by school location.

Research Questions

The study sought to provide answers to the following research questions.

1. What percentage of items in the 2015-2017NECO Agricultural Science multiple choice test items functioned differentially by gender?

2. What percentage of items in the 2015-2017NECO Agricultural Science multiple choice test items functioned differentially by school location?

Hypotheses

The following hypotheses were formulated to guide the study

1. There is no significant difference between male and female students on the percentage of items which functioned differentially in the 2015-2017 NECO Agricultural Science multiple choice test examination.

2. There is no significant difference between urban and rural students on the percentage of items which functioned differentially in the 2015-2017 NECO Agricultural Science multiple choice test examination.

Methodology

The study adopted Descriptive Survey research design and Ex-Post-Facto research design. The population of the study is 10, 194 Agricultural Science students which includes 5043 males and 5151 females. A multi-stage sampling technique was used for the study.

Based on Krejcie and Morgan's (1971) formula for determining sample size from a known population, a total sample size of 728 Agricultural Science Senior Secondary School students (SSS III) were proportionately drawn from the 72 selected secondary schools that constituted the sample size of the study. This consists of 325 private secondary school Agricultural Science students and 403 public secondary schools Agricultural Science students from Abia, Enugu and Imo state. A multi-stage sampling technique was used for the study. The instrument used for data collection was NECO Agricultural Science multiple choice test items (paper III) conducted in 2015-2017 academic sessions. The instrument was re-validated by three experts, two from Measurement and Evaluation and one from the Department of Agricultural Extension Education; all from Michael Okpara University of Agriculture, Umudike. The instrument was administered once in the area that was not part of the sample. The data obtained was analysed using Kuder Richardson Formular 20 with reliability indices of 0.76. Data obtained for the study were analyzed using the Scheuneman modified Chi-square statistic to answer all the research questions and chi-square test statistic was employed in testing the null hypotheses at 0.05 level of significant.

Results

The alphabet on Chi-square value of DIF reflected the group of gender favoured. It was obtained by attaching alphabet f to DIF in favour of females and alphabet m if the item revealed DIF in favour of the males, only when the Chi-square value was greater than 9.49 critical values. Also, the alphabet on Chi-square value of DIF reflected the group of school location favoured. It was obtained by attaching alphabet r to DIF in favour of rural and alphabet u if the item revealed DIF in favour of the urban, only when the Chi-square value was greater than 9.49 critical values.

Research Question 1

What percentage of items in the 2015-2017NECO Agricultural Science multiple choice test items functioned differentially by gender?

ITEMS	2015 $\chi 2$	2016 $\chi 2$	2017 $\chi 2$
1	2.59	.91	3.36
2	5.21	2.59	7.22
3	14.09**m	1.55	1.55
4	4.52	10.38*f	8.38
5	1.12	2.47	2.47
6	2.56	4.06	4.06
7	6.06	7.53	7.53
8	4.65	5.68	5.68
9	4.05	8.01	8.01
10	2.90	7.53	10.16*f
11	3.08	4.38	4.38
12	15.38**m	6.17	6.17
13	2.21	2.16	2.16
14	2.88	10.16*m	7.53
15	0.72	7.58	7.58
16	2.22	4.66	4.66
17	3.96	7.92	7.92
18	1.17	6.09	6.09
19	3.66	7.27	7.27
20	4.48	5.74	5.74
21	9.52*f	7.01	7.01
22	8.04	1.15	1.15
23	6.87	6.28	6.28
24	3.51	1.45	1.45
25	6.33	2.30	2.30
26	3.52	1.10	1.10
27	18.22**f	.80	.80
28	4.29	3.10	3.10
29	3.67	6.26	6.26
30	5.74	.60	11.02*m
31	2.42	3.98	3.98
32	12.98*m	4.86	4.99
33	2.11	2.49	1.69
34	5.12	5.29	14.41**f
35	7.10	1.38	3.55
36	11.49*f	3.06	3.72
37	4.71	4.65	3.00
38	2.52	4.38	4.59

39	2.34	3.47	12.61*m
40	5.66	4.27	3.54
41	2.97	3.79	7.08
42	2.31	1.85	2.83
43	2.80	1.50	.68
44	3.37	3.51	2.98
45	2.58	9.54*f	4.03
46	13.34**m	4.71	2.26
47	0.81	2.98	2.58
48	1.22	3.59	1.08
49	0.89	3.01	5.81
50	2.67	2.73	6.84
51	1.13	6.48	5.58
52	5.55	8.25	1.71
53	11.80*f	15.60**m	2.13
54	5.50	2.36	2.87
55	4.78	.47	2.53
56	1.91	.97	2.04
57	13.93**f	3.82	12.45*f
58	1.44	4.39	3.71
59	3.64	4.34	2.86
60	4.56	3.10	2.67

Table 1: Scheuneman Chi-square Gender differential Item Functioning Indices for May/June NECO Agricultural Science Multiple-Choice Test Items used in 2015, 2016 and 2017 respectively.

From Table 1, it can be seen that nine items representing 15% in 2015 NECO Agricultural Science multiple choice test items significantly function differentially for testees on the basis of gender, while four items representing 7% significantly function differently for testees on the basis of gender in similar test used in 2016 examination and five items representing 8% in 2017 functioned differentially by gender. The above result shows that NECO Agricultural Science multiple-choice test items used in 2015-2017 examinations contain test items that significantly functioned differentially for testees on the basis of gender. Generally, the Scheuneman modified Chi-square comparing NECO 2015-2017 Agricultural Science multiple-choice test items for female and male flagged 18 items with significantly differential items functioning ($p < .05$) DIF. It was revealed that, 10 items out of 18 items representing 56% in NECO 2015-2017, that displayed DIF favoured female while 8 items out of 18 items representing 44% were in favour of male.

Hypothesis 1

There is no significant difference between male and female students on the percentage of items which functioned differentially in the 2015-2017 NECO Agricultural Science multiple choice test examination.

Gender	Percentage	Item favoured due	Df	Chi-square	Sig.(2-tailed)

		to DIF			
Male		44		8(9)	
Female	56	10(9)	1	0.222	0.432
Total		100		18	

Table 2: Chi-square Summary of 2015-2017 NECO Agricultural Science Differential items Functioning in Favour of Male and Female Students.

Data in Table 2 shows that the chi-square calculated value of 0.222 is less than the tabulated chi-square value of 3.84 when tested at 0.05 level of significance with 1 degree of freedom. Therefore, the null hypothesis which states that 'there is no significant difference between male and female students on the percentage of items which functioned differentially in the 2015-2017 NECO Agricultural Science multiple choice test examination is thereby uphold. It implies that there is no significant difference between male and female students on the percentage of items which functioned differentially in the 2015-2017 NECO Agricultural Science multiple choice test examination.

Research Question 2

What percentage of items in the 2015-2017NECO Agricultural Science multiple choice test items functioned differentially by school location?

ITEMS	**2015** χ**2**	**2016** χ**2**	**2017** χ**2**
1	14.64**u	9.96*u	4.83
2	6.25	5.19	4.73
3	2.58	1.22	17.19**u
4	8.67	5.34	6.15
5	14.78**u	5.83	8.02
6	17.23**r	12.66*r	4.67
7	0.75	1.29	2.48
8	6.98	5.58	15.94**u
9	2.19	17.05**u	3.27
10	16.78**u	6.65	17.53**u
11	3.16	13.38*u	6.42
12	7.35	6.48	6.18
13	11.14*u	4.67	8.13
14	2.26	3.17	2.43
15	8.28	13.08*r	14.48**u
16	10.88*r	6.83	8.13
17	5.45	3.17	3.07
18	6.71	5.16	6.35
19	4.54	7.75	10.85*r
20	19.15**r	4.79	5.64
21	12.48*r	3.68	3.27
22	17.13**u	5.47	13.50**u
23	12.70*r	4.33	5.93
24	15.74**u	3.71	8.24
25	7.03	3.42	3.58
26	16.23**u	5.17	11.01*r

27	18.19**u	4.73	6.63
28	19.42**u	6.24	5.35
29	11.98*r	7.05	11.58*r
30	6.19	1.99	4.79
31	9.89*r	17.56**u	5.91
32	8.16	3.66	5.41
33	18.60**u	10.90*u	3.45
34	12.59*r	5.80	3.82
35	15.81**u	3.86	4.18
36	8.54	4.38	6.72
37	10.45*r	4.33	4.65
38	1.95	3.79	8.96
39	4.56	5.92	17.09**u
40	7.64	3.41	4.22
41	16.13**u	10.39*u	3.05
42	9.60*u	1.90	2.07
43	11.96*r	2.70	3.56
44	8.30	7.54	1.25
45	5.67	4.46	11.77*r
46	17.46**u	3.14	1.56
47	3.06	17.83**u	4.44
48	10.50*r	6.67	2.70
49	4.96	4.96	6.09
50	15.52**u	4.54	4.52
51	13.25*r	3.25	5.25
52	8.18	1.92	3.47
53	2.67	2.67	5.97
54	12.84*u	2.50	17.31**u
55	3.73	4.73	2.66
56	3.12	5.77	4.33
57	4.56	8.36	8.23
58	1.71	1.75	1.74
59	3.10	11.38*r	1.55
60	4.46	3.84	11.99*r

Table 3: Scheuneman Chi-square School Location Differential Item Functioning Indices for May/June NECO Agricultural Science Multiple Choice Test Items used in 2015, 2016 and 2017 respectively

Data in Table 3 reveals that a total of 28 test items representing 46% of Agricultural Science multiple choice test items used in NECO examination in 2015 differentially functioned forcandidates from urban and rural areas. In 2016 examination, 10 items or 17% showed evidence of differential item functioning for testees from urban and rural areas, while 12 items or 20% showed evidence of differential item functioning for testees from urban and rural areas in 2017. The above result shows that Agricultural Science multiple-choice test items used in NECO 2015-2017 examinations, contain test items that significantly functioned differentially for testees on the basis of school location.

Generally, the Scheuneman modified Chi-square comparing NECO 2015-2017 Agricultural Science multiple choice test items for rural and urban flagged 50 items with significantly differential item functioning

($p < .05$). It was revealed that, 20 items out of 50 items representing 40% in NECO 2015-2017, that displayed DIF favoured students in rural areas while 30 items out of 50 items representing 60% were in favour of students' from urban areas.

Hypothesis 2

There is no significant difference between urban and rural students on the percentage of items which functioned differentially in the 2015-2017 NECO Agricultural Science multiple choice test examination.

School Location	Percentage	Item favoured due to DIF	Df	Chi-square	Sig.(2-tailed)
Rural		40		20 (25)	
Urban	60	30 (25)	1	2.001	0.242
Total		100		50	

Table 4: Chi-square Summary of 2015-2017 NECO Agricultural Science Differential Items Functioning in Favour of Rural and Urban Students

Data in Table 4 shows that the chi-square calculated value of 2.001is less than the tabulated chi-square value of 3.84 when tested at 0.05 level of significance with 1 degree of freedom. Therefore, the null hypothesis which states that 'there is no significant difference between urban and rural students on the percentage of items which functioned differentially in the 2015-2017 NECO Agricultural Science multiple choice test examination is thereby uphold. It implies that there is no significant difference between urban and rural students on the percentage of items which functioned differentially in the 2015-2017 NECO Agricultural Science multiple choice test examination.

Discussion of Findings

The study showed that Agricultural Science multiple-choice test items used in NECO 2015-2017, contain test items that significantly functioned differentially for testees on the basis of gender. It was revealed that, 10 items out of 18 items representing 56% in NECO 2015-2017, that displayed DIF favoured female while 8 items out of 18 items representing 44% were in favour of male. The correspondent hypothesis revealed that there is no significant difference between the male and female students on the percentage of items which functioned differentially in the 2015-2017 NECO Agricultural Science multiple choice test examination. The finding of this study is similar to the finding of Obinne and Amali (2014) who revealed that there was a significant difference in the differential item functioning of items in the Biology examinations of NECO and WAEC. The finding of this study

agrees with the findings of Adedoyin (2010), who in his study investigated gender biased items in public examinations, and found that out of 16 items that fitted the 3PL item response theory statistical analysis, 5 items were gender biased. The finding of this study also did not agree with the findings of Madu (2012) who revealed that items significantly function differentially by gender for male and female examinees in 39 items and 11 items did not exhibit DIF. The finding of this study also agree with the findings of Olutola, Ihechu and Nuraddeen (2022) who revealed no significant difference between male and female students on the percentage of items which functioned differentially in the 2020 Basic Education Certificate Examination (BECE) mathematics multiple choice test examination.

The study showed that Agricultural Science multiple-choice test items used in NECO contain test items that significantly functioned differentially for testees on the basis of school location. It was revealed that, 20 items out of 50 items representing 40% in NECO 2015-2017, that displayed DIF favoured students in rural areas while 30 items out of 50 items representing 60% were in favour of students' from urban areas. The correspondents' hypothesis revealed that there is no significant difference between the urban and rural students on the percentage of items which functioned differentially in the 2015-2017 NECO Agricultural Science multiple choice test examination. This finding agrees with Schmitt (2008) who reported that mathematical and verbal component of Scholastic Aptitude Test (SAT) measured different things for American white test takers from urban and rural settlements. This study is in agreement with the findings of Mokabi and Adedoyin, (2014) who have reported on the existence of differential item functioning between urban and rural school students. However, the study disagrees with the findings of Inyang 2014 who reported that rural students performed better than their urban counterparts. The reason for rural students to out-performed urban students could be due to their interpersonal ties with their community which provides a conducive learning environment, more so, rural schools have small population, so their small class size creates room for a higher teacher-to-student ratio which is known to be beneficial to learning which enhances good performances. Another reason could be that the urban students did not have adequate coverage of their syllabus in those areas that the items were set. So, in effect, there is no hard and fast rule about the influence of location. This notwithstanding, there is still need to maintain non-bias in test items.

Conclusion

Differential Item Functioning is an issue that must be properly addressed in examinations and tests designed for heterogeneous groups. It is obvious that threat in the validity of test items has been created. Such threats could influence or introduce traits irrelevant to the construct of interest. This could jeopardize classification of subgroup of candidates test scores negatively. The study investigated the Differential Item Functioning of National Examinations Council (NECO) Agricultural Science multiple choice test items (2015-2017) in South East Zone of Nigeria. From the finding it was concluded that Agricultural Science multiple-choice test items used in NECO 2015-2017, contain test items that significantly functioned differentially for testees on the basis of gender. Such items measured different things for testees of the same subject matter ability from male and female testees and that there is no significant difference in the percentage of the number of items functioned differentially by gender in favour of males and those in favour of females in the 2015-2017 NECO Agricultural Science multiple choice test examination, it was also concluded that school location was the greatest influence on differential item functioning. This is because majority of the items showed evidence of school location differential item functioning and that significant difference does not exist in the percentage of the number of items functioning differentially by school location in favour of rural and those in favour of urban in the 2015-2017 NECO Agricultural Science multiple choice test examination. Therefore, test developers, ministry of education and examination bodies should ensure that items are free from differential item functioning (DIF).

Recommendations

On the basis of the findings and conclusion, the following recommendations are made:

i. Test experts and developers should consider the use of Scheuneman modified chi-square in determining differential item functioning. This approach provides an intuitive and flexible methodology for detecting DIF.

ii. Examination bodies should organize training for item developers on the construction of valid, reliable and fair test especially in the area of DIF. In addition, items flagging DIF should be revised, modified or eliminated from the test.

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THEORETICAL FOUNDATIONS REGARDING STEAM EDUCATION AT PRESCHOOL AGE

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Abstract: T*his article supports and promotes the introduction of STEAM education in preschool education and its advantages. Modern education is not a renunciation of the valuable heritage of the past, but a restructuring of its relationship with the future, a 180 degree turn of its point of departure. STEAM education is a challenge of the modern, technological world. Unlike the classical lessons in the traditional system of education where the teacher teaches the students, STEAM is an active, applied and constructivist method of "learning by doing". The children, regardless of their age, should be encouraged to think deeply, so that they have the chance to become innovators and leaders who can solve the most pressing challenges facing our future. STEM and STEAM projects put the foundations of an openness to concepts that would normally come across a lot later and much more theoretical. Postmodern education is adapting day by day the needs of tomorrow's future adults, the key to success being knowing how to adapt and how to use what you have learned, for continuous change and development.*

Key Words: STEAM education, experiential learning, early education, non-formal education, outdoor activity, preschool age, STEAM behaviors.

1. Introduction. Theoretical Foundations of STEAM Education at preschool age

STEAM education is a concept at the beginning in Romania, because it is not provided for in the Curriculum for early education, at the moment, STEAM – the English acronym for Science, Technology,

Engineering, Art, Mathematics is an innovative method based on an interdisciplinary approach that trains the child in transversal skills through 5 disciplines. Using this method from an early age develops to children: critical thinking, the ability to solve problems and find solutions, creativity and imagination, interest and curiosity for new information, exercising both sides of the brain, communication skills and competences, as well as active involvement in the learning process, increasing self-confidence, autonomy, teamwork, learning through discovery, training technical and digital skills.

Thus, the focus of STEAM education is on developing the specific skills of the 21st century, on building the foundation of a future adult who will successfully integrate into a European society, open to continuous change and development.

Postmodern education adapts daily to the needs of the society in which we live. To face new changes and keep pace with them, it is necessary to adapt and use what we have learned, thus combining traditional, classical approaches with modern ones, innovative.

The challenge of the current world requires solutions that assume a new educational paradigm, a transformation of the educational model so as to facilitate and make authentic learning accessible, to offer an interactive, personalized, creative, relevant and quality approach. (Coșarbă, E., 2023)

STEAM education (STEAM: S- Science, T. Technology, E- Engineering, A- Arts, M-Mathematics(en) was born in 2007, through the fusion of STEAM education with the arts. The term art in the context of STEAM education has been considered in different ways (Perignat, K.B., 2019): visual arts (painting, drawing, photography, sculpture, media art, design); visual arts, performing arts (dance, music, theater), aesthetics, craft arts; literal arts and humanities. Carl Jung, who proposed the archetype of the artist - scientist - and Albert Einstein who said that science and art share common roots in mystery, actually led to a slow historical perspective: the two fields have a natural affinity. Thus, since 2007, STEAM education has developed to increase students' interest and motivation in science and technology. Thus, students acquire the necessary skills to keep up with technology and obtain a profession in the 21st century. First, STEAM has the potential for innovation and overall youth achievement through the cognitive results obtained. STEAM education has been characterized according to the type of integration of disciplines as follows (K.B., Perignat, 2019):

● transdisciplinary STEAM education, which involves the total fusion of disciplines and whose main element is problem solving;

● interdisciplinary STEAM education, in which a team represents the common point between the disciplines, but respects the specific approach of each discipline;
● multidisciplinary STEAM education, which involves collaboration between several disciplines. But they do not merge;
● transversal STEAM education, in which the examination/observation of one discipline through the perspective of another discipline is practiced.

In "Educated Romania" project, a sub-chapter is dedicated, which also includes the latest option of integrating Art in the integrated teaching of these STEAM subjects. The sub-chapter that starts from Romania's poor results in PISA and TIMSS studies, which evaluate the results of students in the field of sciences, calls for "the initiation of a strategic approach, national to raise the profile of sciences in education and in society". The report mentions that this "strategic approach" is aimed at children from the pre-school level. The STEAM domain is addressed in the chapter: "Priority domains".

„Preschool education is a crucial stage of learning where children develop social, cognitive, and emotional skills that form the foundation for their future academic and personal success. The role of preschool teachers is essential in ensuring quality of education Behay". (A. Redeș, D., Rad, A., Roman, M.D., Bocoș, 2023, pag 13).

STEAM education represents a new vision in the field of preschool education. It is a modern method that is carried out both in class and in non-formal activities. The STEAM project involves a combined approach that encourages children's hands-on experience and gives them the chance to apply relevant knowledge in the real world, thus encompassing a number of strengths (https://plei.ro/blog/educatia-steam/) :

- arguing and capitalizing on own ideas;
- learning through application, collaboration, teamwork, learning motivation;
- personalized learning;
- development of critical thinking;
- development of communication skills, creativity;
-learning through open questions, inquiry and curiosity.

By combining the four sciences and art whose initials make up its name: S – Science T – Technology E – Engineering A – Arts M – Mathematics creates a learning environment attractive for participants in this type of education, starting from preschool age to applying the methods in everyday life. By integrating STEAM education concepts, subjects, and assessment standards we have a way to change the approach of the ordinary learning process. The introduction of the field

of ART in teaching improves and optimizes the learning process, interconnecting and integrating several fields of learning, thus providing children with a complex learning that will prepare the adults of tomorrow to successfully integrate into today's society.
“This is why a considerable number of studies use ludic or dramatic strategies in the teaching-learning process, with the declared goal of integrating the interlocutors as much as possible, of transposing them into a more manageable reality,, (E., Balaș, A., Roman, D., Rad, 2023, pag. 7)

2. Theoretical Approaches to STEAM Education

STEAM education incorporates critical design thinking and the design process to provide a solution to problem solving, providing experiential learning opportunities through which the children think critically and self-educate. Also, through this type of education, perseverance is encouraged through the understanding of mistakes, as a process in which if something did not go well, the solution is sought.
STEM stands for: SCIENCE, TECHNOLOGY, ENGINEERING, MATHEMATICS. This type of education has been implemented in the education system. In this teaching system, the student learns by doing, in a much more self-taught way, specifically for the system in the Nordic countries. Associated with STEM, the term STEM+ or STEM Plus refers to the application of ICT (Information and Communication Technology) in cyberlearning, which should not be confused with cyber learning, with e-learning or online learning, as they are different concepts.
The term STEAM has also taken over the artistic skills ("A" from Art) that value curiosity and the search for solutions to the same problem, but with a new creative and artistic perspective. The STEAM method was born around 2001, at Rhole Island School of Design, in the United States of America, during a workshop that brought together about 60 experts from different artistic and scientific fields. They sought to develop strategies to merge science and art while teaching new approaches to creative problem solving. Overseas, this is a widely used method today.
In STEAM education, more and more acronyms are added, and the term appeared recently (Science-Technology-Robotics - Engineering-Arts-Mathematics). Introducing robotics brings students closer to electronics, programming, mechanics, etc. Derived from STEAM, the term STEMM also appeared, the last "M" of which corresponds to Music, to also combine with the musical arts.

Traditional education versus modern education should be a topic of reflection for all those who have a role in the training and education of children.

An early introduction to the basic concepts of Steam education can help children develop critical thinking. This learning method must be applied from an early age of the child. To implement this method, teachers must teach using appropriate tools, applying in one approach the five disciplines, which, although it seems complicated, will be a game for children and everything will become natural.

Traditional education encompasses a number of characteristics, among which we mention:

- the school prepares students for life;
- the teaching staff provides children with knowledge, the learning process is a linear progression through the accumulation of information and skills;
- students are serious consumers of information;
- the content of the program is presented globally;
- the emphasis is on the acquisition of basic skills;
- the evaluation is done at the times fixed by an annual planning, etc.

Centering on the child is already a characteristic of contemporary education, which has as its purpose the optimal exploitation of it as a subject of learning. Interactive methods support modern education: "Group learning exercises decision-making and initiative capacity, gives a more personal touch to the work, but also a greater complementarity of skills and talents, which ensures greater, more active participation, supported by many elements of emulation, of mutual stimulation, of fruitful cooperation". (I., Cerghit, 2006)

Interactive methods: create skills, facilitate self-paced learning, stimulate cooperation not competition, are attractive, can be approached from the point of view of different learning styles. STEAM education is a challenge of the modern, technological world. Unlike the classic lessons in the traditional education system where the teacher teaches the students, STEAM is an active, applied, constructivist method of "learning by doing". Children of all ages should be encouraged to think deeply so that they have the chance to become innovators and leaders who can solve the most pressing challenges facing our future. Projects like STEM and STEAM lay the groundwork for an openness to concepts that would normally be encountered much later and much more theoretically.

The advantages of STEM/STEAM education are multiple, among which we mention:

● the STEM and STEAM projects promote learning through experience, through direct exploration and investigation, and engaging

as many senses as possible will help them remember what they learn more easily, so that children create and explore learning;

- STEM/STEAM education includes real world problem solving activities, by creating real situations that have applicability in everyday life;
- integrating Art with Science in a fun way, so children learn to connect seemingly opposite subjects; children work together, find solutions and solve problems;
- encouraging curiosity and analytical thinking through: experiment, questioning, investigation and exploration;
- providing greater control over learning, and when children are in control they care more, will be more engaged and willing to make things happen.

Postmodern education adapts day by day to the needs of young people who are preparing for a future in which the key to success is knowing how to adapt and use what you have learned for continuous change.

The "STEAM educational concept", is referred to as flexible and usable by all educational actors, which harmoniously combines thinking and planning of student variability as a key component towards the design of inclusive and humanistic educational experiences. In addition, STEAM education exponentially contributes to the "catalysis" of the student's creativity, to the individualization of the educational process, to providing the possibility for the 21st century learners to develop, to apply collaborative problem-solving tools and soft skills. (P.Ch.S., Taylor, 2016) The 21st century offers many technological processes resulting from the research of scientists and engineers in higher education institutions, industries, national and international laboratories.

The STEAM concept is a means to bring more innovation and creativity to education. As an educational program it helps embed all activities, lessons and class cohesion, pushing students to further embrace the experiential learning environment.

STEAM education can be applied both within the instructional-educational activities carried out in the kindergarten, as well as within the extracurricular, non-formal activities carried out in the state environment and the private environment within the clubs and educational centers, respectively within the holiday clubs. STEAM education in preschool age is not limited to the accumulation of knowledge. Children will learn through experiential learning activities and become curious and creative, this period will determine how children relate to learning throughout school and life. (Dughi & Torkos, 2022) Meaningful learning also takes place in an informal,

non-formal environment, taking place throughout life as a permanent, complementary, but essential process. (A.F., Roman, 2014)

3. Practical Approaches to STEAM Education

We exemplify an extracurricular activity from the non-formal environment:
Level: II, 5-6 years
Subject of activity: Thanksgiving Day

S. SCIENCE – SCIENCE CLUB entitled: "FUN SCIENCE CLUB" :
- Curiosities about poultry;
- Carrying out experiments:

- "The turkey swelled up!" (ingredients and materials: plastic netting, markers, water, watercolors, Alka Seltzer effervescent tablets);
- "Dancing corn" (ingredients and materials: corn kernels, mineral water, vinegar, glass cup);
- "How do leaves change colors?" (materials: glass jars, autumn leaves, coffee filters, scissors, isopropyl alcohol, food plastic film).

- Conversation: "What is the meaning of Thanksgiving?" (reading pictures about cus-toms and traditions from other countries)
- Autumn story: "About gratitude" (explanation of the term "gratitude").

T. TECHNOLOGY – TECHNOLOGY CLUB entitled: "KIDS TECH CLUB":
- Power Point Presentation on "Thanksgiving", new images and information;
- Using the telephone to photograph the activities carried out;
- Using cookie cutters to get turkey-shaped bread;
- Using plastic knives to cut vegetables;
- Assembling the turkey using the bread forms and cut vegetables

E. ENGINEERING – ENGINEERING CLUB entitled: "GREAT BUILDERS CLUB":
- Making: "The turkey coop" (materials: marshmallows, toothpicks, toilet paper rolls, straws, chopsticks, adhesive tape, template for the image of the turkey);
- Construction game: "Friendly turkeys" (making the construction out of lego pieces);
- Exploring the concept of merging

A. ART - CREATION AND ART CLUB "ART KIDS CLUB":

- Collage: "Happy Turkey" (making a collage using the following materials: colored feathers, turkey template, glue);
- Artcraft: "Turkey Hats" (materials: turkey template, colored cards, scissors, glue, feather template, turkey eyes);
- "Congratulations for Thanksgiving" (cards, palm print with the child's name, autumn decorations)

M. MATHEMATICS – SMART KIDS CLUB called: "SMART KIDS CLUB":

- Didactic game: "How many feathers does the turkey have?" (numbering within the limits of 1-10);
- Developing the ability to understand and use numbers, using an appropriate vocabu-lary;
- Solving the proposed math worksheet, which contains integrated elements from the following fields: Science Field, Language and Communication Field, Aesthetic and Creative Field

4. Conclusions

Through this approach, children will form Steam-type skills: mathematical skills and basic skills in science and technology, as well as artistic skills, and this will contribute to the harmonious development of the individual and the formation of new skills and competencies necessary for successful integration in society.

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https://plei.ro/blog/educatia-steam/

PREDICTIVE ESTIMATE OF OPENNESS TO EXPERIENCE AND SELF-EFFICACY ON EARLY YEARS TEACHERS' PERCEPTION OF HANDS-ON MATERIALS FOR CLASSROOM TEACHING IN LAGOS, NIGERIA

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Abstract: *The study was carried out to examine the predictive estimate of openness to experience and self-efficacy on early years teachers' perception of hands-on materials for classroom teaching in Lagos, Nigeria. The participants in the research were all the public and private elementary schools teachers in Lagos however snowball non-probability the sampling method was adopted to select 150 elementary school teachers as the sample. Three instruments titled Hands-on Materials Utilization Questionnaire (HOMUQ), Openness to Experience Questionnaire (OEQ) and Teacher Self-Efficacy Rating Scales (TSERS) were used to gather the needed data. Six research questions were raised while three null hypotheses were formulated. While the inferential statistics of Pearson Product Moment Correlation Statistic (PPMC) and T-test were employed to test the null hypotheses at a 0.05 level of significance, the descriptive statistics of frequency count, percentage, mean, and mean rank were utilized to answer the research questions. The findings of this investigation demonstrated that early year teachers believed that using hands-on materials was beneficial for teaching young schoolchildren in attendance; however, there is no correlation between early year teachers' perceptions of using hands-on materials in the classroom and their openness to new experiences (r-value = -.003, p-value = 0.484 > 0.05); there is no significant relationship between self-efficacy and early year's teachers' interpretation of how hands on materials in the lecture hall (r-value = -.016, p-*

value = 0.844 > 0.05); there is no significance difference in male and female early year teacher's interpretation of how hands-on materials for classroom teaching (t-value = 1.873, p-value = 0.709 > 0.05). Considering the results, the following recommendations among others were made: Government and private school owners should provide adequate and effective hands-on material(s) and make it accessible to the early year's teachers; Government and private school owners through the ministry of education should organize on regular basis seminar and or workshop to be training the earlier years teachers on how to use hands-on teaching material to deliver instruction in early years classroom.

Keywords: *Self-efficacy, Hands-on Material, Instructional Strategy Efficacy, Student Engagement Efficacy, Classroom Management Efficacy.*

Introduction

Early Childhood Education (ECE) is aimed at promoting holistic development of children from birth to age 8. Children who receive the right sort of support and encouragement during the early years are expected to be creative and adventurous learners throughout their lives otherwise they tend to have a negative disposition towards learning in later life (Ige & Omotuyole, 2012). The recognition of the significance of the first year of a human being in constructing the basis of the personality, the attitudes and principles that will guide thoughts, feelings and the actions of human beings for the rest of their life formed the basis for early intervention through a quality programme of early childhood education. Olowe, Kutelu, and Majebi (2014) define ECE as any group programme that is designed to promote children's intellectual development, socio-emotional development, language development, physical development and learning from birth to age 8. The aim of this educational programme was enlisted by Sooter (2013) to include fostering proper development of children, identifying and addressing their problems, harnessing their potentials, moulding their characters, enhancing their learning and preparing them for life so that their actions are directed toward promoting their own, their communities, and the world's development. However, all the above listed importance and or functions of ECE cannot be effectively achieved without making the use of a hands-on or experimental teaching approach to the teaching and learning process.

A hands-on approach is a way of teaching where students are encouraged to learn via experience. Giving the students the chance to interact with the materials they are learning about, such as plants, insects, rocks, water's magnetic field, scientific instruments, calculators, rulers, arithmetic sets, and shapes, is what is meant by this. In actuality, it is a strategy for teaching in which students actively participate in the learning process. According to Haury and Rillero (2015), A hands-on learning strategy involves the kid in a comprehensive learning experience that develops their capacity for critical thought. The conclusion is that any educational style that is successful in this area may be characterized as activity-oriented. Hands-on-approach has been proposed by many scholars such as Cecilia, Esther & Dorothy (2015) as a means to increase pupil's academic achievement and understanding of difficult concepts by manipulating objects which may make abstract knowledge more concrete and clearer. Students can participate in real-world examples and see the results of changing various factors thanks to a hands-on approach. It provides specific examples of the principles.

This learner-centered approach encourages "do it yourself" science and allows students to view, touch, and control objects while learning. This encourages more seeing and doing than listening. Obanya (2012) verified the aforementioned fact in his convocation talk by adding that practice by doing (activity-oriented) learning has a retention rate of roughly 75% compared to lectures, which have an average retention rate of 5%. It is obvious that the memory rate rises gradually as teaching techniques become more participatory and activity-based. On the other hand, Ekwueme and Meremikwu (2010) reported that some teachers oppose the use of interactive activity-oriented methods (i.e., hands-on approaches), claiming that it takes too much time and does not allow for complete coverage of the syllabus. Fortunately, the successful development of a child to be self-reliant and economically productive is founded on students' level of abilities and knowledge rather than how much of the curriculum they have learned.

Over time, the concept of teacher self-efficacy has been connected with a multitude of critically important educational variables, such as student behaviour. Since teachers are known to impact pupil learning and development positively, teachers' sense of efficacy is an idea that neither researchers nor practitioners can afford to ignore. High self-efficacy educators are known to approach challenging tasks and recover from disappointments and setbacks; whereas, teachers with little efficacy avoid challenging situations and believe difficult tasks are beyond their capabilities. Also, the ability of human beings to influence their environment is strongly linked with belief in their

ability to bring about change in addition year of practical experience. Albert Bandura, the social psychologist who devised the construct of self-efficacy, states, “People’s level of motivation, affective states, and actions are based more on what they believe than on what is objectively the case” (Bandura, 1991). This shows that an individual having a high level of self-efficacy makes judgments about his or her capacity to achieve a certain level of performance which may influence his or her emotive state, goal setting and persistence.

The 'Big Five' personality traits include self-efficacy and being open to new experiences. According to Costa and McCrae (1992), openness to experience is a broad and all-encompassing aspect of personality that is typically "seen in vivid fantasy, artistic sensitivity, depth of feeling, behavioral flexibility, intellectual curiosity, and unconventional attitudes." It is among the "Big Five" aspects of a person's personality that describes how well they can adapt to new and unconventional ideas, circumstances, and lifestyles. Experience-openness comprises both structural and motivational elements. There have discovered that individuals who score well on openness are encouraged to explore new opportunities and conduct introspection. They have a fluid kind of consciousness due to their structural makeup, which enables them to creatively integrate seemingly unrelated thoughts. In contrast, closed individuals like routine and established experiences.

Additionally, there is still a long way to go before teachers are using hands-on materials as effectively as they think they are. The term perception was defined by Wikipedia (2008) as the process of attaining awareness or understanding of sensory information. The Collins Essential English Dictionary (2006) describes perception as an insight or intuition and a way of viewing. Meanwhile, the Merriam-Webster Online Thesaurus (2009) adds that perception the capacity for understand inner qualities or relationships and also just as knowledge gained from the action of coming to know or understand something. In a lay man term, perception is defined as an act of being aware of one’s environment through physical sensation, which denotes an individual’s ability to understand. Rao and Narayan (2009) holds that Perception is one of the key cognitive components of behavior or the psychological process by which humans comprehend their surroundings. In their own words, perception is the process whereby people select, organise, and interpret sensory stimulations into meaningful information about their work environment. They went on to declare perception is the single most significant factor in determining human behavior and that behavior cannot exist without perception. Thus, without any awareness of their capabilities, teachers cannot adopt via means of hands-on materials in an efficient and effective manner.

It is on this note that this study seeks to predictively estimate the impact of openness to experience and self-efficacy on early years' teachers' perception on hands-on materials for classroom teaching in Lagos, Nigeria

Research Questions

The study provides answers to the following research questions;

1) What are the opinions of the early years' teachers on via means of hands-on materials for classroom teaching?
2) Does teacher's self-efficacy affect their interpretation of how hands on materials in early years classroom?
3) Do teachers' openness to experience affect teachers' interpretation of how hands-on materials in the classroom?
4) Does experience influence early years' teachers' interpretation of how hands-on materials in early years' classroom?

Research Hypotheses

The study tested the following null hypotheses;

Ho_1: There is no significant relationship between openness to experience and early years' teachers' opinion on the usage of hands on materials in the classroom.

Ho_2: There is no relationship between self-efficacy and teachers' perception of the use hands-on material in the early years' classroom.

Ho_3: There is no significant difference between male and female early year teacher's interpretation of how hands-on materials for classroom teaching in Lagos, Nigeria.

Methodology

The research design for the study was a descriptive survey type. The participants of the research include private and public primary schools in 16 local governments that makes Lagos metropolis. A sample size of 150 respondents selected through snowball non-probability sampling technique from 3 randomly selected local governments participated in the study. The technique was viewed appropriate because it's challenging for the researcher to ascertain the total number of elementary schools and educators in the metropolis. Three instruments were designed for the study, a self-constructed questionnaire titled Hands-on Materials Utilization Questionnaire (HOMUQ), which has 35 question items arranged into five clusters using the Likert scale format and with reliability value of 0.79 using Cronbach Alpha method was used to obtained data on teachers' utilization of hands-on teaching and learning material utilization. Openness to Experience Scale (OES)

adopted from Goldberg's (1992) Big Five Adjective Markers was the second instrument. While a Self-Efficacy Rating Scale (SERS) adapted from Edwin (2017) study was the third instrument used for the study. The researcher alone administered 150 copies of each instrument to the respondents. All the instruments were properly filled and returned on schedule giving 100% response rate. Inferential statistics of Pearson Product Moment Correlation Statistic (PPMC) and the T-test used to evaluate the null hypotheses. at a 0.05 level of significance while descriptive statistics like frequency count, percentage, mean, and mean rank were used to answer the research questions.

Results

Research Question 1: *What are the perceptions of the early years teachers on the use of hands-on materials for classroom teaching?*

S/N	Item	N	Mean	Std. D	Remarks
1	Use of hands-on materials will make learning easy and fun for young children	150	2.61	1.170	Agreed
2	The use of hands-on materials in the early years will help children understand concepts much better	150	2.12	.883	Disagreed
3	Proper use of hands-on materials will help children retain information	150	3.16	.836	Agreed
4	Use of hands-on materials will serve as motivation for young children	150	3.45	.538	Agreed
5	The right use of hands-on materials will improve student's performance	150	3.33	.620	Agreed
	TOTAL		**2.93**	**4.047**	

Table 2: Perceptions of the Early Years Teachers on the Use of Hands-On Materials

Source: Fieldwork, 2020

Table 2 presents the analysis on the perceptions of the early years teachers on the use of hands-on materials for classroom teaching. It shows that the fourth item has the highest mean score of 3.45, followed by the fifth item with a mean score of 3.33, then the third item with a mean score of 3.16 and then the first item with a mean score of 2.61. While, second item had a mean score of 2.12. Meanwhile, the cumulative means score of 2.93 was attained which is above the

benchmark of 2.0. This by implication shows that early year teacher's percept the use of hands-on material to be helpful for early years classroom teaching.

Research Question 2: *Does teacher's self-efficacy affect their interpretation of how hands on materials in early years classroom?*

S/N	Items	N	Mean	Std. D
1	I am always certain that I can effectively utilise hands on materials in teaching.	150	2.93	.748
2	In general, I think that I can help children obtain desirable outcomes through the use of hands on materials	150	2.54	.765
3	I believe I can successfully teach any topic with the use of hands on materials.	149	2.97	.730
4	I am confident that I can perform effectively in utilising hand on materials for any type of children.	149	3.35	.636
5	Even under pressure, I can work really well in utilising hands on materials	149	3.15	.723
	Total		**2.99**	**0.720**

Table 3: Effect of teacher's self-efficacy on interpretation of how hands on materials

Source: Fieldwork, 2020

Table 3 presents the analysis on the teacher's self-efficacy effect on their interpretation of how hands on materials in early year classroom. It shows that the fourth item has the highest mean score of 3.35, followed by the fifth item with a mean score of 3.15, third item has a mean score of 2.97, and the next is the first item with a mean score of 2.93 while the second item on the table has a lowest mean score of 2.54. Meanwhile, the cumulative means score of 2.99 was attained which is highly above the benchmark of 2.0. This by implication displays that the view of the use of hands-on materials in early year's classrooms is affected by the self-efficacy of the teacher.

Research Question 3: *Do teachers openness to experience affect their interpretation of how hands-on materials in the classroom.*

S/N	Items	N	Mean	Std. D
1	I am always open to new experiences; hence I will not hesitate to use hand-on materials.	150	2.64	.914

2	I adapt easily to unforeseen situations, thus to use hands-on material in my class will be a welcoming idea.	149	2.91	.788
3	It will feel so good to use hands on material in early years classroom because I always have the impression that new things are for the best.	144	3.03	.919
4	I easily adapt to a new environment, thus use of hands-on materials in early years classroom will surely give me an alternative way of teaching.	149	2.57	1.080
5	I can forge ahead even if I am uncertain hence to try out hands-on materials in the early years classroom will be an exciting experience	150	3.15	.814
6	I am capable of carrying on while having faith in my experience hence trying out hands-on materials in the early years classroom will promote more discoveries for me.	146	3.16	.836
	Total		**2.91**	**.892**

Table 4: Effect of Teachers Openness to Experience on Their Interpretation of how Hands-On Materials

Table4 presents the analysis on effect of teacher's experience on their interpretation of how hands-on materials in classroom. It shows that the sixth item has the highest mean score of 3.16, followed by the fifth item with a mean score of 3.15, third item has a mean score of 3.03, and the next is the second item with a mean score of 2.91 while the fourth and the first items on the table has a lowest mean score of 2.57 and 2.04 respectively. Meanwhile, the cumulative means score of 2.91 was attained which is highly above the benchmark of 2.0. This by implication shows that teacher's experience has effect on their interpretation of how hands-on materials in classroom.

Research Question 4: *Does experience influence early year's teachers' interpretation of how hands on materials in the classroom?*

S/N	Items	N	Mean	Std. D
1.	Years of experience using hands on materials in early years classroom enhances teachers' effectiveness in the use of materials	150	3.03	.523
2.	It does not matter if a teacher has experience or not before he can teach with hands-on materials in the early years classroom	150	2.69	.935
3.	Teachers need long period of practice to effectively use hands-on materials with young children in the classroom	132	2.25	1.080

4.	Use of hands-on materials in early years classrooms do not require experience by the early years teachers	150	3.47	.540
5.	Having experience in the correct use of the hands-on materials will positively affect children' learning	150	2.96	1.146
	Total		**2.88**	**0.845**

Table 5: Effect of Teachers Experience on Their Interpretation of how Hands-On Materials

Source: Fieldwork, 2020

Table 5 presents the analysis on effect of teacher's openness to experience on their interpretation of how hands-on materials in classroom. It shows that the fourth item has the highest mean score of 3.47, followed by the first item with a mean score of 3.03, fifth item has a mean score of 2.96, and the next is the second item with a mean score of 2.69 while the third item on the table has a lowest mean score of 2.25. Meanwhile, the cumulative means score of 2.88 was attained which is highly above the benchmark of 2.0. This by implication shows that teacher's openness to experience has effect on their interpretation of how hands-on materials in classroom.

Hypotheses Testing

Three null hypotheses were raised and tested in the research to establish the effect of openness to experience and self-efficacy on early year's teachers' perception on hands-on materials for classroom teaching in Lagos, Nigeria. The first and second null hypotheses were tested using PPMC while independence sample T-test was employed to evaluate null hypothesis three as follows:

Ho_1: *There will be no significant relationship between openness to experience and early year's teachers' interpretation of how hands on materials in the classroom.*

Variable	N	$\bar{X}$	SD	R	Sig.	Remark
Teachers Experience	150	3.14	1.346			
	150			-.003	.484	Significant

Hands-on Material Utilization Perception		3.01	.217			

Table 6: Correlational Analysis of Openness to Experience and Early Year's Teachers' Interpretation of how Hands-on Materials

Table 6 affirms that there is a significant negative relationship between early year's teachers experience and hands-on material utilization perception ($r = -0.03$; $p<0.05$). Therefore, the hypothesis which states that there will be no significant relationship between openness to experience and early year's teachers' interpretation of how hands on materials in the lecture hall is accepted. It means that a negative and insignificant relationship exists between openness to experience and early year's teachers' interpretation of how hands on materials the lecture hall.

Ho_2: There will be no relationship between self-efficacy and teachers' perception of the use hands-on material in the early year's classroom.

Variable	**N**	**$\overline{X}$**	**SD**	**R**	**Sig.**	**Remark**
Teachers Self-Efficacy	150	3.43	.831			
	150			-.016	.844	Significant
Hands-on Material Utilization Perception		3.01	.217			

Table 7: Correlational Analysis of Self-Efficacy and Early Year's Teachers' Interpretation of how Hands-on Materials

Table 7 shows that there is a significant negative relationship between teachers self-efficacy and hands-on material utilization perception ($r = -0.16$; $p<0.05$). Therefore, the hypothesis which states that there is no significant relationship between self-efficacy and early year's teachers' interpretation of how hands on materials in the classroom is accepted. It implies that a negative and insignificant relationship exists between self-efficacy and early year's teachers' interpretation of how hands on materials the lecture hall.

Ho_3: *There is no significant difference between male and female early year teacher's interpretation of how hands-on materials for classroom teaching.*

Variable	N	$\bar{X}$	SD	df	T	Sig.	Remark
Male Teachers	68	2.97	.243				
				148	1.873	.709	Significant
Female Teachers	82	3.04	.189				

Table 8: T-Test Analysis on Difference in Male and Female Early Year Teacher's Interpretation of how Hands-On Materials

Table 8 shows that there is a significant difference between male and female early years teacher's perception on via means of hands-on materials ($t = 1.873$; $df = 148$; $p<0.05$). Therefore, the hypothesis which states that there is no significant difference in male and female early year teacher's interpretation of how hands-on materials for classroom teaching is accepted. Female early year's teacher have a higher mean (mean = 3.04) than male (2.97) teachers.

Discussion

Analysis of data revealed the research question one in Tables 2 showed that, early year teacher's percept the use of hands-on material to be helpful for early years classroom teaching. This might be because manipulative tools (hands-on material) are valuable tools to help students of any academic level understand difficult concept especially in calculative subject like mathematics and it is suitable for a levels of pupils' ability as well. The findings validated the statement of McIntosh (2012) that "It is obvious that even with minimal exposure, students of all intelligence levels can benefit greatly from the use of manipulative". A hands-on learning technique involves the kid in a thorough learning experience and enhances their capacity for critical thought, according to Haury and Rillero's (2015) claim. Obanya (2012) verified in his convocation lecture that the average recall rate of learning by lecture is 5% whereas that of practicing by doing (activity oriented) is approximately 75%, providing more empirical support for the findings.

The results from research question two, which are presented in table 3, demonstrated that teachers' perceptions of hands-on materials in early year's classrooms are affected by their perception of their own efficacy. This might be because nothing much can be achieved from using only hands-on material in the teaching process without the presence of teachers who possess strong self-efficacy, capable and able to go to any length to ensure pupils success academically. This was in totality with the opinion of Adeoye and Popoola (2011), that for

learning to take place, learners must have access to necessary information materials and resources. They have to interact with tangible and intangible resources especially the teachers who will illustrate and demonstrate the appropriate use of this material. It also supported Mutai (2006) assertion that learning is strengthened when there are enough reference materials and that academic achievement illustrates per excellence the correct use of these materials.

The findings from the research question three and four as shown in table 4 and 5 showed that, teacher's openness to experience has effect on their interpretation of how hands-on materials in classroom. This is because a teacher with little or no experience will not be able to administer the usage of hands-on material effectively. Then it will considered most time by such a teacher as time consuming and he or she will be facing difficulties completing the curriculum. The results further supported Ekwueme and Meremikwu's (2010) assertion that some teachers oppose the use of interactive activity-oriented methods (i.e., hands-on approaches), claiming that it takes too much time and prevents them from covering the entire curriculum because they lack experience with their application.

A negative and negligible association between openness to experience and early year teachers' interpretations of how hands-on materials in the classroom work was also shown by the study hypothesis one outcome, as shown in Table 6. This is best explain through the descriptive statistic of the respondent which clearly showed that most of the early year teachers used for the study had less than 10 years of teaching experience which in real sense has not prepared them adequately to the dos and don'ts of the hands-on material utilization and which might have made many of them to considered hands-on material(s) as time consuming and facing difficulties utilizing it.

In Table 7 on research hypothesis two, the result showed that, a negative and insignificant relationship exists between self-efficacy and early year's teachers' interpretation of how hands on materials in the classroom. The findings was in agreement with that of Shabnam and Mohammad (2020) which found that the self-efficacy of soft science and hard science teachers was significantly correlated with their teaching practice, with the English language teachers' efficacy-teaching relation not reaching a statistical significance. Lastly, the findings from research hypothesis three as shown in table 8 showed that, there is a positive but insignificance difference in male and female early year teacher's interpretation of how hands-on materials for classroom teaching. This finding agreed and disagreed to that of Prosper (2013) who investigated teachers' perceived use of teaching and learning materials in inclusive classrooms. It agreed to this study

because it was found that though gender affects the teacher's perception toward usage of both education and learning material but in the aspect of disagreement a significant difference were noted between male and female teachers' perceived use of teacher learning material while in the present study insignificant difference was noted.

Conclusion

Considering the results from the research, it is concluded that openness to experience and self-efficacy do have a relationship with early year's teachers' interpretation of how hands on materials in the classroom, but not a meaningful connection. In addition, regardless of their gender, early year's instructors believe that using hands-on materials is beneficial for early year's classroom teaching. Additionally, aspects like scheduling enough time, providing enough, being accessible, having widespread awareness, and having the flexibility to improvise contribute to support the use of hands-on materials in the classroom activities by early year's instructors.

Recommendations

The following suggestions are given in light of the study's findings:

1. Owners of both public and private schools should provide adequate and effective hands-on material(s) should always be provided and accessible to the early year's teachers.
2. Government and private school owners through the ministry of education should organize on regular basis seminar and or workshop to be training the earlier year's teachers on how use hands-on teaching material to deliver instruction in early year's classroom.
3. The state ministry of education should ensure regular supervision to the early year education centers or schools to enhance effective use of hands-on material for instructional delivery.
4. Government and private school owners should also provide a good and favourable working environment to the instructors so as to enhance their organization commitment, which will make them behave in a way they will not have and will in turn make them improve their self-efficacy towards ensuring pupils success.
5. Government and private school owners should also ensure they employ mostly teachers with pool of teaching experience or those who have gone through teachers' education training since they will be able to utilize different kind of instructional materials especially hands-on material effectively.

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OUTDOOR EDUCATION AS AN INTERFACE BETWEEN TRADITIONAL AND MODERN LEARNING APPROACHES: A CURRICULUM-BASED ANALYSIS AT CORE CURRICULUM STAGE IN ROMANIA

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Abstract: *This study delves into the pivotal role of outdoor learning in acting as a connecting thread between conventional and contemporary teaching methods within the realm of core curriculum education. As educational methodologies continually evolve, educators are keen to adopt innovative approaches that effectively engage and educate students. Traditional teaching methods, while enduring, coexist with modern pedagogical practices that emphasize experiential learning, active participation, and holistic development. The research explores how outdoor learning functions as an intermediary, facilitating a seamless fusion of traditional and modern educational practices. Its primary focus is to investigate the influence of outdoor learning on student motivation, critical thinking, and overall educational achievements, particularly within the core curriculum stage. By employing a combination of quantitative and qualitative analyses, this study seeks to highlight the advantages and obstacles associated with the incorporation of outdoor learning in core curriculum subjects. It aims to pinpoint effective methods for embedding outdoor experiences into conventional classroom settings, thereby contributing to a more comprehensive comprehension of how outdoor learning can enrich the educational experience. The insights garnered from this research endeavor have the potential to provide valuable guidance to educators, curriculum designers, and policymakers in striking a harmonious balance between time-honored teaching techniques and innovative strategies. This equilibrium*

aims to create a well-rounded, enhanced learning environment for students at the core curriculum level.

Key words: *outdoor education; interface; curriculum, core procurement cycle; analysis.*

Introduction

One of the greatest dilemmas faced by educators in their professional activities is the transition of knowledge and learning content from theory to practice. The link between theory and practice, the bridge between outdoor activities and the outcomes they can have in developing cross-cutting competencies, is the teacher. Through their skill and professionalism, they select appropriate teaching methods, adapting them to the learning situations they offer for implementation. In this chapter, we propose examples of outdoor learning situations that complement traditional ones so that the two forms of education are seen as a single entity. Their interrelationship and the enhancement that outdoor activities can bring to the traditional ones represent significant benefits in the current educational process. Educators face a profound challenge in their roles: the seamless translation of knowledge and learning content from theory to practical application. The pivotal bridge between theory and practice, between traditional educational approaches and the potential for outdoor activities to enhance the development of cross-cutting competencies, is the teacher. The teacher, with their expertise and professionalism, selects teaching methods wisely, adapting them to the unique learning scenarios they provide for implementation. Within this study, we delve into a series of outdoor learning scenarios that complement traditional educational methods. The objective is to portray these two educational forms as a unified entity. The interconnectedness and the enrichment that outdoor activities bestow upon traditional education represent profound advantages in the modern educational process. In the following, we explore how outdoor learning experiences can be integrated harmoniously with conventional teaching methods, aiming to create a comprehensive educational landscape. This synthesis holds the promise of providing valuable insights for educators, curriculum designers, and policymakers as they endeavor to foster a more holistic, enriched learning environment for students. The study investigates the pivotal role of outdoor learning in bridging the gap between traditional and modern pedagogical practices, thus laying the foundation for an enriched educational experience.

Fundamental perspectives

Teachers are constantly concerned with selecting the methods they use in the instructive-educational process. Education is in a state of continuous development and change, and educators must keep pace with social and educational updates. Trends are imposed both by students, through their needs and interests, and by society, through the daily demands it presents. These directions are also determined by the leadership of educational systems, whether they are local, national, or international, through the policies they operate and the innovations they introduce into curricula. These translate into specific learning activities directly offered to learners, through the content and practices they engage with. Educators and teachers serve as the bridge between learners and society, and they must facilitate and streamline the educational process by understanding their students, traditional and modern working methods, adapting them to the group's needs, and through continuous updates of knowledge and their own policies and teaching styles. (Ciolan, 2008)

Consequently, an instructor should always be ahead when it comes to anticipating the various elements of the instructional and educational process. They should strive to create contemporary and effective learning experiences. This entails thorough research, continuous learning, adaptability, knowledge acquisition, and, most importantly, direct engagement with the classroom or student group. This involvement should encompass consistent observation and analysis to discern the necessary direction for their development. To provide effective teaching, it's essential to build a comprehensive understanding of the students' group profile. In the realm of education, the modern teacher faces a perpetual balancing act between two prominent educational approaches. On one hand, there's the traditional method, well-structured, deeply rooted, stable, and extensively studied, which has underpinned educational systems for decades. On the other hand, there's the modern approach, characterized by flexibility, interactive learning methods, communication, and development through teamwork techniques. It's crucial to acknowledge that achieving new outcomes in education requires departing from the same old methods. This holds particularly true in the field of education. (Crețu, 1997)

The discussion in the specialized literature often revolves around the need to educate in a way that fosters competencies, especially those that are transferable. This can only be achieved through the adoption of innovative, interactive methods that encourage teamwork, socialization, self-discovery, and mutual understanding. Such an approach may entail stepping outside the conventional boundaries of

learning, embracing the new, and being open to operating within diverse frameworks. The negative consequences of thoughtless changes and the desire for rapid implementation of new methods are emphasized, leading to chaos and the students' inability to adapt. Consequently, students become increasingly disengaged, failing to focus on competency development, integrated learning, or improving their own performance, turning classrooms into environments that churn out uniform and robotic end products. The first condition to have a good lesson is to be able to attract the students' attention which implies a selective trial of the psychological activity regarding an object or phenomenon. The filter or selection of the messages takes place not only in the brain but also in the inferior levels of our nervous system. The concentration of our attention determines the growth of the efficiency of the cognitive and practical activity. (Dughi & Cotră, 2014)

A curriculum-based analysis at core curriculum stage in Romania

In order to optimize the utilization of knowledge regarding the curriculum and its components, it is recommended to scrutinize the school curriculum at the fundamental acquisition level. This is imperative as there should be a well-defined understanding of expectations to facilitate the seamless integration of outdoor activities while closely adhering to the curriculum's principles.

First stage

Primary education represents the initial phase of compulsory education and its primary objective is to provide equal opportunities for all children in order to foster a balanced cognitive, emotional, and psychomotor development tailored to individual needs. Primary education encompasses the preparatory class and grades I to IV, with the preparatory class serving as the first step in primary education. (M.E.N., 2017)

The preparatory class represents a period aimed at acclimating students to school life, providing them with time to adjust to the schedule, the community, and the specific requirements of this diverse environment. Its primary purpose is to foster socio-emotional, intellectual, and physical development. From a socio-emotional perspective, the preparatory class helps children build self-confidence, enhance self-esteem, initiative, and the desire for success. It is an integral part of compulsory general education, preparing students primarily for the specific learning they will encounter in the first grade and subsequent years of schooling. The adjustment to the school environment is made as friendly as possible, with play being the predominant method of

learning, especially suitable for six-year-olds. In the same vein, it can be stated, in accordance with the Ministry of National Education, that the preparatory class fosters the intellectual development of each child. It equips them with improved communication skills, the ability to sustain intellectual effort, and a diverse range of learning experiences. Additionally, this level sets the conditions for a curriculum tailored to the age-specific needs of the students in a stimulating environment that promotes their mental and physical development. A relaxed environment is maintained by the absence of grade repetition, not only after the preparatory class but also after the first grade. This period is when measures are put in place to prevent and address inequalities among students from disadvantaged backgrounds at the beginning of their school journey. It aims to identify learning difficulties early and provide individualized interventions.

Assessment is conducted continuously, and based on the recorded results, immediate interventions are implemented throughout the school year. Students also have the opportunity to participate in the "School after School" program. The preparatory class enrolls children who have turned 6 years old by the beginning of the school year. Upon written request from parents, guardians, or legal representatives, children who turn 6 years old by the end of the calendar year may also be enrolled in the preparatory class if their psychosomatic development is appropriate. (M.E.N., 2017)

The main directions for modernizing the Romanian curriculum are based on an analysis of the current curriculum and the education system, as well as several European guidelines, such as the qualifications framework and key competencies. The OECD promotes curriculum flexibility through personalized education and a focus on the student. These directions require a deep understanding of each student's developmental needs, which serves as the foundation for educational approaches. It also involves the use of teaching strategies that engage all students in activities and allow for customization based on each individual's diverse learning needs and styles.

Romanian Education Law No. 1/2011, Article 6, outlines how the hours allocated to school subjects can be used. The curriculum covers 75% of teaching and evaluation hours, leaving the remaining 25% at the discretion of the teacher. The extra time can be used for remedial learning for children with special needs, to reinforce knowledge, or to stimulate students capable of superior performance, according to individual learning plans developed for each student.

In 2013, new programs were introduced with a restructured format, incorporating the three programs for the preparatory class, first grade, and second grade into a single format for better visualization and

monitoring of continuity and progress in terms of competencies and content. This presentation facilitates ongoing connections with the previous and subsequent grades, ensuring curriculum coherence. Another new element is the organization of content into specific domains for each subject, demonstrating continuity and progression from one year of study to the next. The specific competencies and content included in the programs are closely interlinked. The new program provides a more detailed presentation of content to emphasize the elements on which the focus should be placed when practicing specific competencies.

The curriculum areas around which content is organized are: language and communication, mathematics and natural sciences, human and society, physical education, sports and health, arts, technologies, and counseling and guidance. These areas are designated based on epistemological and psycho-pedagogical principles and criteria. Within each of the presented curriculum areas, content is delivered using diverse resources and through various types of activities designed to be as engaging as possible for children. For example, activities can be organized into simultaneous workshops to provide variety and better monitoring, especially for activities with increased difficulty levels. Outdoor education finds its place in organizing activities in the preparatory class, with the school curriculum encouraging beneficial educational practices for students, both individually and as a group.

Analyzing the competencies described at this level, it becomes apparent that cooperation, socialization, participation in activities in a variety of contexts are highly desired. In the document presented by specialists from the Ministry of National Education, the emphasis is placed on the use of natural materials, familiar and open environments, self-discovery, and belonging to diverse social groups. It encourages the discovery of national identity and connection to the urban or rural environment, as well as curiosity for phenomena, relationships, and regularities in the nearby environment. It also promotes caring for a clean and friendly environment. Problem-solving, critical thinking, observation, or comparison are expected to take place in a natural and friendly environment that offers numerous natural resources. Exploring sensations or emotions can be accomplished in the natural surroundings near the group room. Recognizing beauty in everyday life, participating in various competitive games, and identifying simple ways to maintain health in a familiar environment are competencies that should be developed at this age, utilizing outdoor education activities and adapting the content to the natural environment to facilitate the students' familiarity with this educational level more

easily and effectively. (***Progresia competenţelor în Ciclul achiziţiilor fundamentale)
The elements presented above indicate an openness and motivation to utilize outdoor education, along with all its components, to develop key competencies and cross-cutting competencies at the level of the preparatory class. The core concept of interdisciplinarity lies in the fact that, on one hand, the conceptual and methodological frameworks of multiple disciplines are interconnected to examine a theme or issue, but more importantly, to foster integrated, cross-cutting, key, and interdisciplinary competencies. (Universitatea București, 2013)
The suggested teaching materials to be used in the proposed learning activities do not carry a mandatory requirement. These learning activities serve as recommendations for competency development. They can be adapted to the specific needs of each class, depending on the resources available to each teacher. Teachers should aim to establish connections between subjects by providing relevant learning contexts that align with the daily reality of preparatory class students. These contexts should keep the students engaged in their familiar environment while being simultaneously engaging, instructive, and useful. (Dumitrescu, 2013)
At the end of the preparatory class, an assessment report is generated in the form of a standard document. This report records the level of achievement of both general competencies and specific competencies associated with each subject. The document is an integral part of the student's educational portfolio, and its purpose is to guide and optimize the educational process, preparing students to meet school requirements. The report is utilized to improve the educational process and serves as the basis for educational guidance and counseling decisions. It helps in creating and updating individualized learning plans for students. The curriculum for the preparatory class marks the beginning of an unprecedented curriculum modernization in Romania. This includes the development of numerous high-quality curriculum documents and the training of teachers through participation in courses and seminars to enhance their instructional skills at this level.

The second stage
The second level in the fundamental acquisition cycle is the first grade. At this stage, students participate in school programs that capitalize on the learning experiences they've accumulated up to the age of seven, including those from the preparatory class. For children who haven't completed the preparatory class, there are no obstacles to acquiring knowledge and later developing competencies. This is because evaluation is concentric, and the content is constantly revisited. As

mentioned earlier, the first level of the fundamental acquisition cycle is designed for adaptation and socialization, whereas in the first grade, the curriculum analysis shows that it's the year of effective integration into the educational environment. Notably, there's the introduction of grades as a form of assessment. There are new elements in terms of content as well. Some content elements belonging to the curriculum areas have already been studied in the preparatory class, so they are given less time in the first-grade curriculum. Additionally, in the fundamental acquisition cycle, the emphasis is on communication, and students are put in situations where they communicate in concrete contexts. A welcoming and open working atmosphere can also be created at this level through the use of modern teaching strategies. Activities can be organized in a varied and enjoyable manner in open spaces, utilizing the natural environment and its elements as much as possible. Games and toys are equally utilized, with students encouraged to create their own resources for play and learning. Consequently, the use of outdoor learning elements is encouraged, as is the utilization of natural surroundings. Content is introduced gradually, as in the preparatory class, using counting and intuitive support in the context of exploring the student's nearby and familiar environment. Didactic games predominate, ensuring active student participation. Exploring the nearby environment, asking questions, verbal interventions, expressing their own ideas and feelings related to what they learn, and proposing solutions to problems are all encouraged. Whenever possible, it's preferable to organize teaching sequences for observing, experimenting, measuring, and collecting data regarding various plants and animals in the natural environment. Such holistic learning, closely aligned with the child's knowledge universe, is advantageous as it tends to be more engaging and aims to provide a deeper understanding of concepts. (***Anexa 7 la OMEN nr. 3371/12.03.2013)

Current school programs promote experiential learning by involving students directly in the studied reality. The focus is on applying knowledge, skills, and values in real-world contexts, increasing the emphasis on practical and applied activities within each school subject. The development of competencies largely depends on how the teacher designs and organizes learning and the extent to which they emphasize the applied dimension of knowledge. (Dumitrescu, 2013)

The third stage

The second grade is the final level among the three within the fundamental acquisition cycle. By the end of the second grade, the aim is for the student to be capable of:

- Using various forms of communication in real-life situations, including receiving and producing short and simple verbal and non-verbal messages in familiar contexts, employing basic terminology conventions specific to different school subjects, and interacting in familiar communication contexts in their native language.

- Demonstrating creative thinking and adaptability in various situations by displaying curiosity for change, showing interest in engaging in focused and structured activities like those proposed by the educator, and expressing artistic sensitivity through simple means.

- Valuing their own experiences in investigating the natural and social environment by observing elements in their nearby environment, demonstrating curiosity for phenomena in their surroundings, reporting observed relationships in their immediate environment, using simple procedures to solve problems, and providing simple explanations for questions like "When?", "How?", and "Why?", as well as expressing simple opinions about objects, events, or phenomena in the surrounding environment.

- Understanding and performing social roles within different types of communities, including showing an interest in relating within the classroom, participating in group activities, being willing to resolve conflicts, observing the identities of family members and how they interact, and manifesting their own personality within a social role.

- Understanding and using technology appropriately, including demonstrating discipline and perseverance in completing simple tasks in familiar contexts, accepting guidance and cooperation in the learning process, seeking information to solve simple, specific tasks, using information and communication technology, and showing an interest in a balanced computer access program.

- Internalizing a set of individual and social values to guide their behavior by displaying confidence in their abilities, caring for a clean and friendly environment, showing an interest in a healthy lifestyle and work regimen, and forming opinions about aesthetic aspects in their surroundings.

- Mobilizing their own potential to build a quality life through developing a sense of purpose, engaging in goal-oriented activities with a focus on achieving those goals, and playing different roles in playful activities and everyday life. (***Notă privind elaborarea planului-cadru pentru învăţământul primar, Clasa pregătitoare şi clasele I – a II-a, 2013)

Through an analysis of the competencies required for a student who has completed the second grade and finished the fundamental acquisition cycle, one can observe the need for dynamic, natural, open

education that maintains a constant connection with society and its members. It emphasizes a commitment to the environment, natural areas, and harmonious physical and cognitive development in the natural environment. The encouragement of self-discovery and relationships based on communication, sharing, discovery, and experiential learning is also evident, with a holistic and interdisciplinary approach to education. (Roman, 2014) The goal of this educational level is to provide the conceptual, psychological, and behavioral foundations that allow a child to adapt efficiently to the next stage of education, and, more importantly, to ensure the rapid social integration of each individual. Competencies can be acquired more easily and rapidly if each teacher prepares the necessary space and resources for modern learning, taking into account the needs and interests of each child. This can be achieved, especially through the use of outdoor education activities. At the end of this study cycle, a national evaluation of fundamental competencies is conducted, with test items developed by the National Center for Evaluation and Examination. It begins with an integrated test based on reading in Language and Communication, followed by a test in Mathematics and Natural Sciences. Each test is allocated 30 minutes for completion, and the tests are administered in the normal classroom where students carry out their daily activities. The results are not recorded in the class register, and they are used at the school level for developing individualized learning plans and informing parents about the progress of the assessed competencies.

Good practices in integrating outdoor learning activities in the curriculum of coreprocurement cycle

There are specific methods used in primary education to achieve the most effective teaching and learning activities. A method is a set of operations that serves as a tool for human action, generally through which a knowledgeable subject approaches the revelation of the essence of the objective world. Didactic methodology signifies the entirety of methods and procedures used in the teaching process, based on a unified concept of the teaching-learning-evaluation process and the principles and laws it follows (Dumitru, 2005). In modern education, there is no longer a distinction between the significance of some methods over others. Presently, education focuses on how these methods are employed to achieve the set objectives (Cerghit, 2006).

Adapting Established Methods in the Context of Outdoor Education

Outdoor education, whether used as the sole form of learning or as a learning strategy within traditional education, brings about positive

changes in learning styles and the way existing methods are adapted in various situations. The most common way to use the outdoor approach is by applying well-established and known methods in outdoor settings. In this way, outdoor education becomes efficient and easy to use for every educator, regardless of the age group they are working with. Within outdoor education, both traditional teaching methods and interactive methods that enhance group cohesion can be employed. Depending on the objectives, the number of participants, the desired outcomes, and the chosen setting, the methods to be used can be determined, as well as how they will be adapted to meet the group's needs and ensure that the entire activity leads to effective learning. The science that deals with the study of teaching methods is didactic methodology, which serves as a theory and a collection of methods and procedures used in the teaching process. A method is a set of operations that functions as a tool for human action in general, through which the knowledgeable subject approaches the revelation of the essence of the objective world. (Dicționarul de pedagogie, 1979, Bocoș, 2007)

In the current and comprehensive conception of educational methods, as per the definition given by Ionescu, a teaching method represents a means of action, a tool through which students, under the guidance of the teacher or independently, acquire and deepen their knowledge, form and develop intellectual and practical skills, abilities, competences, behaviors, attitudes, and more (Ionescu, 2003, Dughi & Roman, 2008). According to this definition, it can be stated that outdoor education is an educational strategy that fosters competencies and can be utilized in various learning situations.

Research methodology

The primary objective of this study is to explore the role of outdoor education in connecting conventional and contemporary teaching approaches within the framework of the Romanian primary and secondary education core curriculum. This research will extensively examine the curriculum's content, teaching strategies, and the incorporation of outdoor learning activities to evaluate their influence on students' educational achievements and the broader educational experience. Also, it will offer an extensive comprehension of the integration of outdoor education into the central Romanian curriculum, illustrating how it functions as a bridge connecting conventional and contemporary educational methodologies. The results have the potential to enlighten educational policymakers, curriculum designers, and educators about the efficacy of outdoor education in enriching the learning experience and promoting holistic student growth.

Furthermore, it might provide valuable insights into potential enhancements to the curriculum and teacher training to maximize the advantages of outdoor education in Romania.

Teacher and Student Survey results

The main questions used were based on the following:

- Positive Attitudes and Perceptions
- Improved Engagement
- Academic Benefits
- Enhanced Social Skills
- Environmental Awareness
- Challenges and Concerns
- Integration with Curriculum
- Variability in Experiences
- Recommendations for Improvement
- Impact on Well-being
- Teacher Preparedness
- Barriers to Implementation

The results of these surveys inform us, as educational policies and practices, and are helping educators and policymakers make informed decisions about the incorporation of outdoor learning into the curriculum and how to optimize its benefits. They also highlight the strengths and weaknesses of outdoor education programs and guide improvements in this area of education.

Fig. 1. Survey results on outdoor education as the interface between traditional and modern learning

Observations

After visiting numerous primary and preschools form Arad County, we have managed to comapre methodologies and learning environments.

The main elements observed were as it follows:

- Diverse Outdoor Learning Environments
- Engaged Students
- Varied Teaching Methods
- Integration with Curriculum
- Teacher Involvement
- Safety Measures
- Student Interactions
- Student Learning Outcomes
- Environmental Education
- Challenges and Obstacles
- Teacher Training and Development
- Stakeholder Collaboration
- Equity and Inclusivity
- Student Well-being
- Use of Technology.

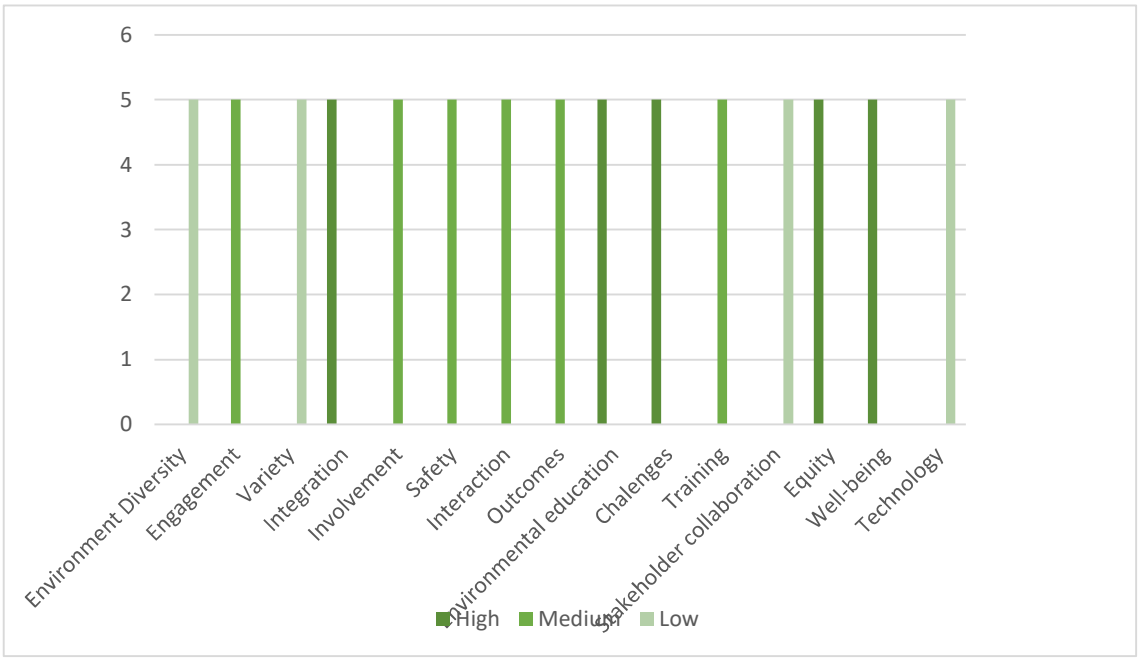

Fig. 2. Observation results of the on-filed activities on outdoor educational ractices in Arad County preschools and primary schools

Data analysis

These results of a long stage research on the above mentioned concept, offer insights into various aspects of education in schools and preschools from Arad County, particularly focusing on the integration and impact of outdoor education. (Torkos, 2018)

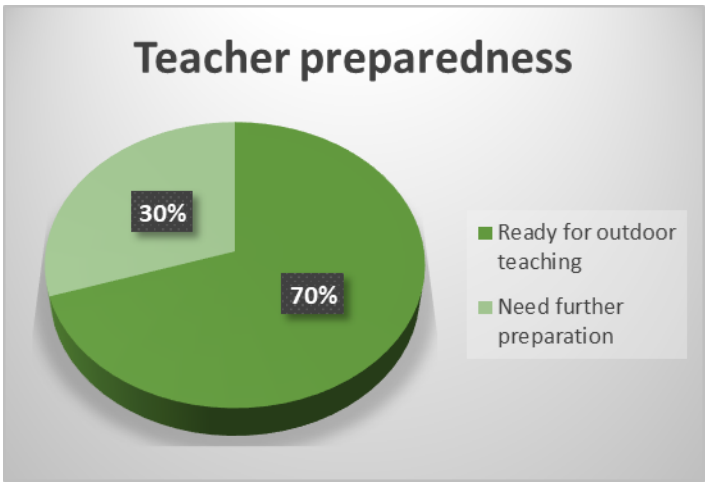

Fig. 3. Data analysis on teachers readiness

Data suggests that 70% of teachers feel adequately prepared to facilitate outdoor education activities, while 30% express a need for additional training and resources.

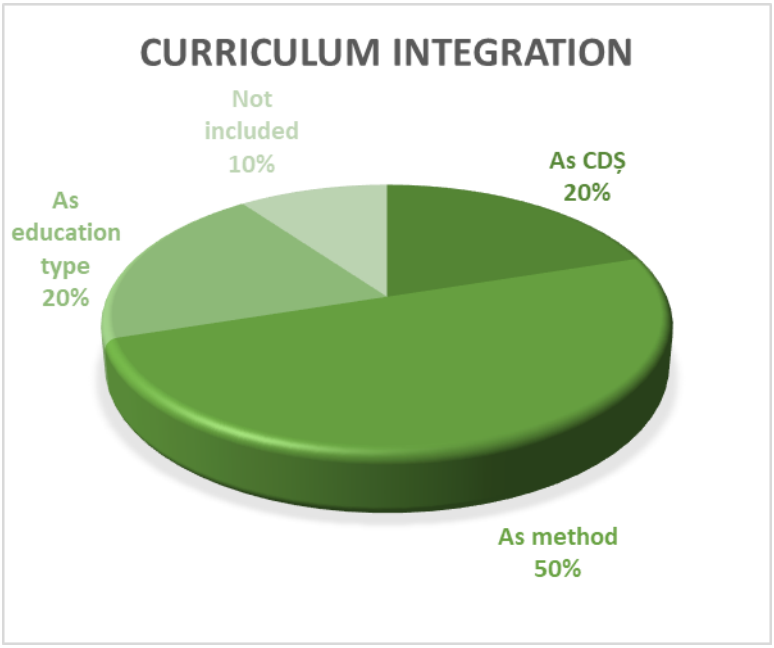

Fig. 4. Data analysis on curriculum integration

The analysis indicates that the majority of schools have successfully integrated outdoor education into their core curriculum, in one of its forms, with only a very small percent (2%) not having it integrated it at all.

Conclusions

The study indicates that outdoor education has a positive impact on student engagement. Students are more motivated and enthusiastic when involved in outdoor learning activities. This engagement can contribute to a more effective and enjoyable learning experience. he findings demonstrate that outdoor education is associated with improved academic performance, critical thinking skills, and problem-solving abilities among students. It enhances their cognitive development, which is essential for their overall educational progress. Outdoor education is effectively integrated into the Romanian core curriculum, acting as a bridge between traditional classroom-based learning and modern educational approaches. This integration fosters a more holistic and well-rounded educational experience. The study reveals that outdoor education significantly enhances students'

environmental awareness and their sense of responsibility for nature. This is essential in cultivating environmentally conscious citizens and contributing to sustainability efforts. Based on the findings, the study suggests recommendations for further enhancing outdoor education in Romania. These recommendations may include additional investment in outdoor learning resources, teacher training, and stronger community engagement. It is associated with reduced stress levels and an improved sense of mental and emotional well-being. Collaboration with local communities, environmental organizations, and experts is identified as a key factor in enriching outdoor education programs and expanding their impact.

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BIOLOGY TEACHERS' IMPACT ON STUDENTS' ACADEMIC PERFORMANCE IN SENIOR SECONDARY SCHOOLS IN OSUN STATE, NIGERIA

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Abstract: *This study examined the Biology teachers' impact on the performance of students in secondary schools in Osun State, Nigeria. This study sample included forty-eight (48) Secondary Schools selected by random sampling technique. The researcher designed teachers' questionnaire which were administered to one hundred forty-five (145) Biology teachers. Researcher-designed validated questionnaire was used to elicit information from the respondents on the impact of biology teachers to the performance of students. Three research questions and two research hypotheses were formulated. Frequency counts and t-test statistics were used to analysis the data collected. Finding of this study revealed that Biology teachers' impact to teaching in Secondary Schools was significant based on gender but it was not significant based on years of teaching experience. Based on the research findings recommendations were made on how the Biology teachers will have positive impact on s*tudents' performance in senior secondary schools among others.

Key words: *biology; teachers, students'; performance; senior secondary chools;*

Introduction: Biology is a unique branch of Science that deals with the study of life. It is the branch of science that involves the study of the life of plants, animals, humans and any others type of living organism Akanji, Babunmi &Bewaji, 2003). Biology can also be defined as the natural science concerned with the study of life and living organism, including their structures, function, growth, origin, evolution, distribution and taxonomy. However, Biology is broadly divided into Zoology, Botany etc. Zoology is the branch of Biology that related to the animal kingdom including their structure, embryology, evolution, classification, habit and distribution of all animals, both living and extinct and how they interact with their ecosystem while Botany is the study of plant life. (Grejson, 2013).

Students Perform poorly in biology because the biology classes are usually too large and heterogeneous in terms of ability level. In addition, the laboratories are ill-equipped and the biology syllabus is over loaded (Ahmed, 2008; Ajayi, 1998). Most teachers fail to realize that they are very vital in educational effectiveness at the classroom instructional level. How they teach, behave and interact with students in the classroom or during teaching are sometimes more vital than what they teach. It is therefore clear that a teacher's way of thinking and attitude determines his/her behaviour and decision inside and outside the classroom (Onoshakpokaiye, 2011). Abidoye, Ahmed, Ahmed, & Maroof (2022) observed the availability of Laboratory Facilities on Students' Performance in Upper Basic Schools in Kwara State, Nigeria. The result shows that there was significant difference in the performance of students.

Gender determines what is expected, allowed and valued in a woman or a man in a given context. The differences in societal value of men and women in terms of responsibilities, activities undertaken, access and control over resources as well as decision taken are all gender based. Abiri & Ugborugbo (2008) examined the influence of gender on the productivity of secondary school teachers in Delta state, Nigeria. The results of the analysis revealed that although there was no significant difference in the productivity of male and female teachers, the male teachers were generally more productive than their female counterparts and that female teachers were more influenced by location than the male teachers. Okoro, Ekanem & Udoh (2012) investigated the effect of teachers' gender on the academic performance of children in primary schools in Oyo metropolis. But the results showed that teacher-pupil gender interactions do significantly affect pupils' academic performance.

Teaching experience is a vital tool in the science teaching and learning situations. Experience can be said to be the attitude or skill acquired by

the teacher through his perception and participation in instructional programmes. The experience of the teachers will help him to be able to cope and adapt to change in the educational programmes (Lawal, 2011). Hanushek, Rivkin and Kain (2005) observed the Market for teacher quality and the finding indicated that students of experienced teachers achieved better than students of new teachers (those with one to three years of experience). The Centre for Public Education (2005) stated that research has been consistent in finding positive correlations between teaching experience and higher students' achievement. Teachers with more than five years teaching experience were found to be the most effective while inexperience is shown to have strong negative effect on students' performance.

Purpose of the study: This study determined the Biology teachers' impact on students' performance in senior secondary schools in Osun State, Nigeria.

Specifically, this study examined:

(1) Biology teachers made on the students performance in the senior secondary school in Osun State
(2) Biology teachers impact on the students' performance in the senior secondary school in Osun State based on gender
(3) Biology teachers impact on the students performance in the senior secondary school in Osun State based of years of teaching experience

Research Questions: The questions is formulated below

(1) what is the Biology teachers impact on the students' performance in the senior secondary school in Osun State?
(2) Does the gender of Biology teachers have impact on students' performance in the senior secondary school in Osun State?
(3) Does years of teaching experience of biology teachers have impact on students' performance in the senior secondary school in Osun State?

Research hypotheses: The questions is formulated below

(1) There is no significant difference on the Biology teachers' impact on students' performance in the senior secondary school in Osun State.
(2) There is no significant difference on Biology teachers' impact on years of teaching experience on students' performance in the senior secondary school in Osun State.

Material and Method: This study is a survey method of descriptive type. The research instrument consist two session questionnaire. Session 1 contains general information about the responded and

session 2 contains questions for the responded. These studied has be carried out in senior secondary school in Osun State, Nigeria. This included biology teachers in all Secondary Schools located in Osun State, Nigeria. The studies were carried out in forty- eight-eight (48) secondary schools in Osun State. The total numbers of 145 biology teachers were involved in the study. Variables that were tested in the study were: gender and years of teaching experience and Biology teachers' impact on students' performance was determined in the studies.

A minimum of one hundred and five (145) Biology teachers were involved in the study. A researcher-designed teachers' questionnaire was used as the instrument for the collection of data from science teachers in the sampled schools. T-test analysis was used to test both the hypotheses one and two.

Results: Research Question One

What is the Biology teachers' impact on students' performance in the senior secondary school in Osun State?

Table 1 shows the numbers of responses of Biology teachers' impact to the performance of students in Osun State, Nigeria. The total number of respondents was 145 Biology teachers. The mean score was 89.54. The Biology teachers' impact on the performance of students was significantly positive since p-value (0.00) < 0.05 (t =22.90; df 144 and p-value 0.00). This shows that Biology teachers in Osun State, Nigeria generally had positive impact on the students' performance

	Number of respondents	**Mean Score**	**Std. Deviation**	**T**	**Dt**	**p-value**
Total	145	89.54	***52.02***	***22.90***	144	0.00

Table 1: Mean Score and t- test for testing Biology Teachers' impact on the students' performance in Osun State, Nigeria

Research Question Two: Does the gender of the biology teachers have impact on students' performance in the senior secondary school in Osun State?

Table 2 shows that the mean scores for male was 76.73 and for female was 66.51 and that no significant difference existed between the score of male and female Biology teachers impact on the students' performance since the p-value (0.04) < 0.05. The null hypothesis 1 (Ho_1), which states that there is no significant difference in the impact of gender of the biology teachers on students' performance in the senior secondary school in Osun State based on gender is rejected.

Gender	No of Respondents	Mean Score	Standard Deviation	Std. Error Mean	t value	df	p-value
Male	92	76.73	39.55	4.12	1.42	144	0.04
Female	53	66.51	45.60	6.26			

Table 2: Mean Scores and t-test for testing Biology Teachers' impact on students' performance based on Gender in Osun State, Nigeria

Research Question 3: Biology teachers impact on years of teaching experience on students' performance in the senior secondary school in Osun State?

Table 3 shows the mean scores and reveals that there was significant difference between the experienced and less experienced Biology teachers impact to the students' performance in Osun State, Nigeria since the p-value (0.51) > 0.05. The mean scores range between 72.02 and 73.68. The null hypothesis 3 (Ho_2), which states that there is no significant difference on the impact of years of teaching experience of biology teachers on students' performance in the senior secondary school in Osun State, is not rejected.

Experience	No of Respondents	Mean Score	Standard Deviation	Std. Error Mean	T	Df	p-value
Less experience (0-5)	60	72.02	43.24	5. 58	0.23	144	0.51
Experience (above 5years)	85	73.68	41.34	4.48			

Table 3: Mean Scores and t-test for testing Biology Teachers' impact on the students' performance based on years of teaching experience in Osun State, Nigeria

Summary of Major Findings: The research findings of this study as obtained from t-test based on the Research questions and hypotheses are summarized as follows:

(1) Biology teachers had positive impact on students' performance in senior secondary school in Osun State, Nigeria.

(2) The Biology teachers' impact on the students' performance in the secondary school based on gender was significant.

(3) The impact of Biology teachers on students' performance in the secondary school based on their years of teaching experience was not significant.

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Declaration of interest statement

The study was from Lecturers from university of Ilorin, Ilorin, Kwara State, Nigeria

Hereby, we as the authors consciously assure that for the manuscript "

" the following is fulfilled:

- This material is the authors' own original work, which has not been previously published elsewhere.
- The paper reflects the authors' own research and analysis in a truthful and complete manner.
- The results are appropriately placed in the context of prior and existing research.
- All sources used are properly disclosed.

DISCUSSION:

In this study, it was found out that Biology teachers' impact on students' academic performance in Osun State, Nigeria was significant based on their responses. Biology teachers had positive impact on students' performance. These may be due to the fact that they are the key to students' success because they play an important role in imparting the knowledge and equipping the students to be useful to themselves and the society. This is in agreement with the findings of Afolabi (2007) who examine the influence of the science teachers' attitude and gender factor as determinant of pupils' performance in primary science and found out that the attitude of science teachers have greater effect on the students' academic performance.

It was established in this study that there was significant difference in the Biology teachers' impact on students' performance based on their gender. This may be hinged on the fact that intelligence is gender based. This study is in agreement with the finding of Okoro, Ekanem & Udoh (2012) who investigated the effect of teachers' gender on the academic performance of children in primary schools in Oyo metropolis.

It was found in the study that there was no significant difference in Biology teachers' impact on students' academic performance based on their years of teaching experience. It may be due to the fact that both experienced and less experience Biology teachers are able to concentrate on the most appropriate way to teach particular topics to students who differ in their abilities, prior knowledge and backgrounds. This finding is in agreement with the finding of Hanushek, Rivkin and

Kain (2005) who observed the Market for teacher quality and the result indicated that there was no significant difference. Similarly, also agree with the finding of Abidoye (2017) observed the influence of gender and experience of senior school Biology Teachers on their Ecology teaching in Kwara State. The findings showed that no significant difference existed in the experience and less experience biology teachers.

Conclusions: Based on the findings of the study, the following major conclusions can be drawn. Biology teachers had positive impact on the students' performance in Osun State and based on their gender while Biology teachers impact based on years of teaching experience was not significant in the analysis conducted.

Recommendations: Based on the findings of this study, it is hereby recommended that;

(1) Adequate instructional materials should be made available for Biology teachers to further enhance their positive impact on the students' performance.
(2) Both male and female science teachers should be encouraged by provision of special incentive for improvement on their impact on students' performance.
(3) Both experienced and less experienced Biology teachers should be encouraged to acquire more professional experience in order to improve on their impact to students' performance.

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