

# INFORMATION AND COMMUNICATION TECHNOLOGY FOR INCLUSIVE EDUCATION – THE EVALUATION OF A TEACHER TRAINING

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**Abstract:** *For a successful inclusive education, the teachers have required and participated in additional training. However, the information and communication technology (ICT) for inclusive education is seldom covered, and a model of effective training is not available. The current study aimed to evaluate a teachers’ training on ICT for inclusive education. The training unfolded in class and online with group and individualized activities. The evaluation aimed to improve the training’s planning, content, and format. A pre-training questionnaire, the participant’s portfolio, a post-training questionnaire, and trainers - trainees discussions provided data for evaluation. The theoretical framework followed the Kirkpatrick’s model of evaluation. The results showed that the training met the participants’ expectations and it was positively appreciated. Also, the participants express confidence that the acquired ICT skills will help them achieve inclusive education in class. Overall, the methods and the training format can be replicated.*

**Keywords:** *educational policies; inclusive education; ICT competences; teacher education; program evaluation;*

## 1. Introduction

After a long time of schooling segregation in special and mainstream schools as the only approach to differences between children abilities, the education systems worldwide started to build bridges for inclusiveness (Ainscow, 2005). The inclusive education paradigm refers to the integration of children with disabilities in the mainstream schools and concomitantly the adaptation of the education processes to all students’ needs and requirements, including those with learning difficulties (Ainscow, Booth, & Dyson, 2006). Internationally, inclusive education is seen as a reform of education to address the diversity - instead of commonality – of learners, while in a narrow approach it means that all children, including those with disabilities, learn together, in the same school and class (Ainscow, 2005; Hodkinson, 2005).

Organizational change depends on individual change and teachers find themselves at the core of the paradigm shift toward inclusiveness and its success. (Ainscow, 2005; Lindsay, 2007; Pantic & Florian, 2015). New approaches to learning shift the role of teachers from knowledge and skills providers to learning facilitators (Jung, 2005), and the responsibility of learning from teacher to student (du Toit, 2015). The teachers’ traditional skills continue to be valuable and their role in education does not diminish but the new responsibilities associated with student-centred learning require specific training (du Toit 2015; Martinovic & Zhang 2012).

Information and communication technologies (ICT) appear to meet both learning and teaching needs in an inclusive education and tend to play an increasing importance in teachers' training (Livingstone, 2012; Tondeur, van Braak, & Valcke, 2007; Mahmud & Ismail, 2010; Florian & Hegarty, 2004). It was shown that in comparison with the traditional approaches, ICT stimulate the development of intellectual skills; diversify the ways of learning knowledge, develop skills and attitudes; spur more spontaneous interest in learning; help to concentrate longer (John & Sutherland, 2004). Also, the learners have positive attitudes towards ICT use in education due to the flexibility and the interaction they facilitate by contrast with traditional teaching methods (Sanchez, Mena, He, & Pinto, 2012; Heemskerk, Brink, Volman, & ten Dam, 2005).

In regard to learning disabilities, the few studies that go beyond assistive technologies have drawn attention to a) specialized hardware and software for students with dyslexia, b) virtual learning environments particularly useful for people with social interaction difficulties and cognitive disabilities, and c) websites that seem to be powerful motivators for adults with learning disabilities (Williams, Jamali, & Nichols, 2006). Beside its role in reading and writing, the technology has a high potential of diverse activities as mediators of learning such as creating, designing, performing, search, play, improvise, experimentation, simulation, multimodal navigation and remixing, multitasking, networking, negotiation, and judgment of diverse information sources, (Livingstone, 2012). A UK survey found that 54 percent of the respondents with disabilities considered internet access "essential" in contrast with six percent of the general population (Knight, Heaven, & Christie, 2002).

The term ICT includes a large variety of tools such as devices (personal computers, laptops, printers, LCD projectors, cell phones, iPods, and digital cameras), adaptive devices, software, data bases, and networking (internet, multimedia resources, and web sites) that continue to develop and diversify (Martinovic & Zhang, 2012). The teachers need to be aware of the ICT potential for education, need skills to use technology and knowledge to choose the appropriate ICT type for a specific educational objective, and altogether they need training (Benigno, Bocconi, & Ott, 2007).

There is also worldwide agreement that the ICT skills and its educational uses are the most beneficial for teaching and learning (Valcke, Rots, Verbeke, & Van Braak, 2007; du Toit, 2015; Jung, 2005; Galanouli, Murphy, & Gardner, 2004). Internationally, many training courses for professional development integrate ICT (du Toit, 2015). Standards for teachers' ICT knowledge/competency have been elaborated and are available for guidance (UNESCO, 2011; Infodev, 2015).

Preferences for methods vary among lectures, presentations, demonstrations, collaborative activities, individual work, personal contact between trainee and trainer (Galanouli, Murphy, & Gardner, 2004; Valcke et al., 2007). As Watson (2001) showed, the approaches to teaching vary also: a) a trained teacher becomes a tutor for his/her colleagues, b) a tutor makes demonstrations before assisting the trainees' individual work, c) the participants take responsibility for their learning and learn by them-selves under the tutor assistance, the use of good ICT resources to boost motivation and interest in trainees. A different approach commonly mentioned in the literature was described as supply-driven with pre-defined objectives and content (Valcke et al., 2007).

Different training formats have been identified, such as stand-alone courses, part of foundation courses, workshops, on-line courses, distance learning, face-to-face, self-study, residential, school located or a combination of these (du Toit, 2015; Valcke et al., 2007; Galanouli, Murphy, & Gardner, 2004; Jung, 2005). The teachers in UK and the Netherlands preferred courses tailored to the participants needs, led by colleague-coachers, that combine face-to-face with on-line activities, provide ongoing support and advice post-training (du

Toit, 2015; Valcke et al., 2007; Galanouli, Murphy, & Gardner, 2004; Jung, 2005). The same respondents disliked on-line training, distance learning, self-study, and lectures.

Overall, guidelines for an effective training course lack consensus. Criteria for successful models of ICT training such as flexibility, capacity to meet individual needs, follow-up activities, and ongoing support after the course is over have been formulated (Valcke et al., 2007) but need confirmation. The most effective approaches to training have yet to be identified and hence the necessity of evaluation studies (Jung, 2005).

In Romania, the unique national curriculum for teacher's education include neither ICT training nor disciplines relevant to children with special needs. After graduation, the teacher's professional development continues, but it is an individual responsibility. Consequently, while the framework for inclusive education in schools is well articulated by policies, educational studies, and methodological guidelines, the teacher's training for inclusive education is less systematic, and far behind.

A large array of ICT tools proved to be useful for inclusive education are available in the Romanian schools. Examples are wiki-, blogs, podcasts, social media networks, tools for bookmarking, tagging and annotation of social websites, specialized searching engines, and widgets-gadgets. However, they are seldom used in class because the teachers lack the technological competence and qualified guidance to achieve the ICT skills.

According to the "Survey of Schools: ICT in Education" and "POSDRU -ePROF" ([www.eprof.ro](http://www.eprof.ro)) findings, the school teachers in Romania rank below the European average in experience of using ICT. Accordingly, only 58 percent of the Romanian teachers reported advanced knowledge and skills (such as using multimedia objects in online learning environment, data transfer between Office suite applications, using spreadsheet programs such as Microsoft Excel), and a much smaller proportion (15.6%) used Web 2.0, eLearning or any ICT in class activities.

The aim of the current study was to evaluate a training course, the "Project eMentor: The development of competences and ICT skills and teacher training on mentoring persons with disabilities (PeM)". The PeM had three components as follows: a) the evaluation of the teachers' training needs, b) the teachers training, structured in two modules namely ICT competence and TMPD competence, and c) the evaluation of the teachers' training. The project's overall goal was to develop competences that encourage the use of ICT in class activities to facilitate the teacher's interaction with students with disabilities and their learning. The project was carried out in Sibiu and Galati, during 2014 and 2015. The training needs evaluation was conducted in June 2014 (Mara & Corman, 2015).

## 2. Methodology and Methods

The current study focused on the ICT training organized in Sibiu that unfolded between September 2014 and November 2015. The training included a demonstration of assisted technology equipment -such as printer, keyboard and tagging devices for Braille, scanner Iris IRISCAN Pro 3 Cloud, Player Daisy, recorder with voice control, touch screens displays for monitors, e-book reader, special licenses for disable persons, screen reader, lecturer and voice for Romanian language.

Of the 3007 teachers that answered the call for training, 1521 were selected and 748 were trained in Sibiu. The socio-professional composition of the participants in Sibiu is shown in Table 1. The socio-professional composition of the ICT training participants

Socio-demographicCategories	Number	Percent	
Gender	Woman	671	82,84%
	Man	139	17.16%
School Location	Urban	556	68,64%

Socio-demographicCategories		Number	Percent
	Rural	254	31.36%
School level	Primary (grades 1-4)	103	12.72%
	Secondary (grades 5-8)	283	34.93%
	Vocational (post secondary)	103	12.72%
	High School (grades 9-12)	213	26.3%
	College	108	13.33%
Teaching Experience	First year	113	13.95%
	2-9 years	163	20.12%
	10-14 years	168	20.74%
	15-19 years	179	22.1%
	20 years or more	187	23.09%

The participants were divided in 28 series of 24-26 individuals, differentiated between basic and advanced needs of ICT competence. The training duration was 48 hours divided in face-to-face activities (in class) – 32 hours, and online assignments - 16 hours. The content of the module is shown in the **Table 2**. Theoretical aspects of ICT were addressed in face-to-face activities, while practical aspects of using technology and the course's evaluation in on-line and face-to-face activities. The trainers presented the support material for the training and accomplished the planned applications.

Table 2. The ICT training topics and objectives

ICT Topics	Teachers, ICT - beginners	Teachers, ICT - advanced	Professors, ICT - advanced
Microsoft Word – text editing			
Google Docs – create educational content online			
E-learning Platform EUPD			
Microsoft Excel			
Microsoft Power Point and Prezi –presentation designing			
Browser Mailer – web page presentation			
Computer assisted education			
VoiceThread			
Web 2.0 tools for teaching and learning			
Computer technologies for adapting content to diverse special needs / disabilities			
Mobile technologies for teaching and learning			
Open source authoring tools for creating Learning Objects			
Objectives	Learn concepts and methods specific to ICT and digital resources	Introduce the trainees to specialized technologies and tools for the virtual	

ICT Topics	Teachers, ICT - beginners	Teachers, ICT - advanced	Professors, ICT - advanced
		teaching.	
	Integrate ICT and teaching competencies to increase the educational activities quality and the learning outcomes evaluation.	Learn to create educational content for students with special learning needs and to use web 2.00 tools to accommodate students with disabilities.	
	Develop the skills to use ICT in school education in special for the inclusion of students with disabilities	Adapt teaching and evaluation methods to mobile technologies and e-learning platform	

The support material was available to participants on the e-learning platform. After face-to-face activities, each trainer assisted the participants during practical activities and evaluation on the e-learning platform, for about three hours, according to a schedule set at the beginning of the course. The on-line assignments were differentiated by the participants' ICT competence level and were evaluated on the e-learning platform (<http://www.e-mentorat.ro/moodle/>) followed by feed-back from trainers. The on-line assignments outcomes were included in the participant portfolio.

The information for the program's evaluation was collected through a pre-training (expectations) questionnaire, the participant's portfolio, a post-training (satisfaction) questionnaire, and feed-back from the participants. The pre-training questionnaire had four open questions. The first two questions addressed expectations regarding the course content and organization, the third referred specifically to difficulties in teaching students with deficiencies expected to be addressed during the training while the fourth asked about the expected outcomes of their training.

The post-training evaluation or the satisfaction questionnaire consisted of 11 questions, of which 10 were Likert type with five response options. The questions 1 to 6 addressed various aspects of the curriculum such as objectives, content, methodology, and evaluation. The questions 7 to 10 asked the participants to measure how well the knowledge and the skills achieved during the training will help them in teaching students with special needs/disabilities. One open question was used to collect suggestions for the training's improvement.

The training evaluation followed the Kirkpatrick's model (Kirkpatrick and Kirkpatrick 2006). The model recommends the evaluation of the training effectiveness on four levels as follows: 1) reactions to training overall, 2) knowledge, skills and attitudes achieved during the training, 3) changes in behavior as a result of the training, and 4) the training results from the organizers point of view. These aspects are further addressed in detail and provide the theoretical frame for the current evaluation.

### 3. Results

#### 3.1. Participants' reactions

The reactions were measured in terms of how useful the training was, the strengths and weakness of the training, the quality of instruction and of the presentations, the trainer-participant interaction, the quality of the support materials, the content of the training, the usefulness of assignments, the group interaction, the use of technology, the level of difficulty, the course structure and the time management.

The analysis of the pre- and post-training questionnaires showed that the majority of the participants appreciated positively the way the course was organized, how it unfolded, its content, its methods, its venue and facilities, the trainers' performance. More than 90 percent of the participants were contented with the quality of the information and the training methodology.

One of the expectations with an important role in the participants satisfaction was a hands-on approach to learning instead of boring lectures. Thus, the interactive activities, the variety of communication methods, the psycho-affective environment that encouraged experiencesharing, the team-work – were all valued and beneficial. Also, the opportunity to mingle with colleagues from other schools and regions of the country was mentioned as a positive aspect with impact on learning. The trainers' notes confirmed that the participants engaged in activities and showed interest in the technology applications in education, in special in activities that benefit various learning needs.

The attitudes toward ICT and its application in the inclusive education evolved from scepticism to confidence in positive outcomes. The trend was more visible among beginner teachers who were also more sceptical initially compared to teachers with more years of practice. The majority of the participants asked for a follow up training on more advanced levels of ICT and their application to teaching. Moreover, the participants recommended the inclusion of ICT for education in the national curriculum for teacher's initial and continuing education.

### 3.2. Knowledge and skills acquired during the training

The change in knowledge, skills and attitudes regarding the use of technology and its integration in teaching was measured against the training content and learning objectives (see Table 2). With few exceptions, the participants in the basic ICT level class had not had an e-mail address, had not open a Word document or had not turn on a PC prior to the training. Despite progress in computer literacy (Microsoft Office Suite tools) during the training, the online applications were challenging for them. In the advanced ICT class, the participants experience with Microsoft Office Suite and Web 2.0 technologies allowed the trainers to focus on skills enhancement and diversification in these areas.

The post training questionnaires showed that overall, all participants described the training content and the methods as contemporary and innovative. Most valued aspects were the technology web 2.0, the knowledge and ability to create virtual professional communities on the e-learning platform, and the module dedicated to technical equipment and devices to assist people with sensorial deficiencies captured great interest. The teachers' exposure to these technologies triggered enthusiasm over the existence of these technologies and disappointment over their absence from schools.

The trainers confirmed the high interest in the practical activities. For example, the participants asked many questions about the ICT's potential for individualized education, and about resources regarding the integration of ICT in the education of students with disabilities. The online assignments boosted even more the interest and the enthusiasm for using ICT in instruction

### 3.3. Behaviour change

The change of behaviour in this context refers to the integration of technology in teaching, and learning. It is a process that takes weeks and months but meanwhile the intention to change is a good indicator (Fishbein and Ajzenk, 2010). The participants did express the intention to use the acquired knowledge and skills in class, in particular with students with special needs. Some participants started to plan changes in the school education, during the training. Others initiated a process of sharing ICT resources with

colleagues. And others created on-line discussion groups or signed up for professional networks.

#### 3.4. Program results

The final results were evaluated and interpreted in terms of instruction such as communication methods, curriculum, trainers, support materials and provide valuable information to the organizers. The evaluation of the individual portfolios compiled during the training resulted in a performance ranking. The top 10 percent of the participants were selected to participate in professional exchanges in four European countries, namely Great Britain, Italy, Spain, and Austria. The prospect of a visit of foreign universities and schools that implemented inclusive education had a positive impact on the teachers' attitudes and behaviour.

Two types of difficulties encountered during the training are worth mentioning. One refers to the trainers' language that was too technical for a non-IT audience. The difficulty was overcome through informal, open dialog between the participants and the trainers leading to the adjustments in wording. The other one refers to the self-evaluation of the ICT learning needs that resulted in the placement of a few participants in the wrong competence category. The trainers addressed the difficulty with a flexible approach to learning and individualized assistance while the participants fully cooperated to achieve their goals.

In a positive note, the participants made valuable suggestions for future trainings. One of them was about the teacher's conduct in educational activities in different environments. Another topic of high interest was how to adapt a lesson's content to various learning needs of students in the same class.

#### 4. Discussion

The current study aimed to evaluate a teachers' training on ICT for inclusive education. The evaluation was aimed at improving the training's planning, content, and format to increase its effectiveness. The results show that both the training objectives and the participants expectations were met. Consequently, the objectives, content, methods and format of the ICT training can be replicated.

The knowledge and the skills targeted by the training were in line with the international standards recommended for the ICT integration in pedagogy and evaluation studies conducted in other countries (du Toit, 2015; Jung, 2005; Valcke et al., 2007; Galanouli, Murphy, & Gardner, 2004). Also, the study adds more enthusiasm for a hands-on approach to learning, found more effective and more likely to be applied in class (Russel et al., 2003; Jung, 2004). The course format combining face-to-face activities with online activities confirmed previous appreciation (Valcke et al., 2007).

It was not a surprise that the Romanian teachers, like their counterparts in other countries recommended that the ICT instruction be included in teacher's training at all stages, the initial training and the in-service teacher continuing development while assistance and advice are made available at any time. As stated in the literature, the teachers' professional development is a process, not an event (du Toit, 2015) and the ICT competency more than any other aspect of professional package illustrates this due to its rapid progress on one side and its popularity among the school children. Thus, the ICT training should catch-up with the technology progress and standardize its integration in teaching (Martinovic & Zhang, 2012). Educational policies that promote the integration of ICT in the teachers' education have great impact on teachers' motivation for improvement, on training opportunities, and on professional recognition from the education community (du Toit, 2015).

Also, the results confirm the need of specific training to effectively integrate ICT in teaching (Martinovic & Zhang, 2012; Russel et al., 2003; du Toit, 2015). Hodkinson (2006) provided clear evidence that the training influences positively the participants' attitudes

toward inclusive education due to increased perceived competence. Similarly, the participants in the current study displayed an increasingly positive attitude toward inclusive education and a growing self-perceived competence in this regard.

The interest in assistive technologies for people with sensorial deficiency shown by the participants highlighted the chance of success in making the education inclusive. It demonstrates that the lack of information is the source of resistance, that can be overcome. Moreover, it suggests that the Romanian teachers are open to change and to professional development while support and resources can speed up the process.

Across the countries, teachers express different preferences for the training format. For example, in the Netherlands, the teachers prefer training courses within their school, even better during the school hours (Valcke et al., 2007). However, the Romanian teachers enjoyed the residential training format that provided them extra-time for networking and discussions on their own learning experience.

About 20 percent of the participants were not satisfied with one or another part of the training. One reason might be the misplacement of some participants in the ICT level-class based on self-evaluation. Although efforts were made to accommodate the outliers, it is possible that frustration still built up. Therefore, the evaluation of the ICT competency and the training needs a revision.

As stated in the introduction, in Romania, the school has no responsibility for the in-service teacher's continuing development. The teacher's participation in training was therefore a personal choice and a private matter. The immediate consequence was the difficulty of finding a teacher replacement for classes scheduled during the training. The more lasting and serious consequence is the lack of school engagement and support for the use of ICT in school. As research findings show, the effective use of ICT in class is a complex process that demands time and institutional support besides equipment and individual competence (Sanchez et al, 2012; Hodkinson, 2006; Pijl, 2010; Valcke et al., 2007). Regardless the training quality and success, in the absence of school support the teachers' ICT skills shrink and their competences erode over time (du Toit, 2015). Thus, the training organizers should at least involve the school authorities in the process of the participants selection and even better motivate the principals to support them after the training. The training organization can also be improved by adding a follow up evaluation, six to 12 month later. It would be an incentive for the participants to apply their achievements and for the school authorities, if involved, to encourage and support changes in school education.

The international educational policies and practices regarding inclusive education continue to be one of the big challenges of the current educational system in Romania. The studies on educational policies regarding the inclusion address changes at organizational and methodological levels. These studies relate to the general level of education (educational macro system), as well as the level of educational facilities (school micro system). Unfortunately, the studies of educational policy are necessary but not sufficient if they remain declarative, rhetorical products of politicians and governmental methodological tools. Similarly, at the operational level, the strategies, the programs, and the projects proposed are not enough to link the educational policies with the classroom activities. The action level, namely what occurs at the teachers' mentality level and translates in teaching is poorly addressed and does not cover the whole problem of inclusive education.

The current training evaluation used conventional research means such as questionnaires pre- and post-training but also unconventional means such as the material produced by participants during the course included in the participant portfolio, face-to-face discussions between trainers and trainees, feed-back from participants, and the trainers' observations. The combination of different methods to collect information for the current



evaluation study highlights important aspects of the learning process that could not be obtained through conventional methods (Danson, Loveday, & Dalton, 2010). Consequently, nonconventional methods provide practical clues for planning and improving future training programs.

## 5. Conclusions

The educational system, as part of the society is influenced by a number of political, economic, technological and cultural changes among others. On the politic stage, the European schools promote the ideology of diversity that affirms the necessity of changing the schools' environment in schools for all children. Inclusive education is just a facet of this broader ideology that support equal rights for all children, regardless their ethnicity, religion or disability. Changes in the society lead to changes in the educational process, in all three essential components teaching-learning-evaluation. The teacher's role in class has changed and consequently the teacher's education must change. The education policies must assure the conditions for both students and teachers' education in line with the societal changes.

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