# HOW DO TEACHERS USE THE NEW COMMUNICATION TECHNOLOGIES IN TEACHING ACTIVITY?

**Daciana LUPU, Ph.D.,**
**Simona Elena TOMOZII, Ph.D.**
**Transilvania University of Brasov, Romania**
**f-pse@unitbv.ro**

**Abstract.** *The research aimed to investigate the teaching activities in terms of teaching resources used in teaching. The teaching resources were dividing into two categories: classical teaching resources and modern teaching resources belonging to the new informational technologies. The research objective concentrated on the investigation of teaching activities from the perspective of two categories of teaching resources (classic and modern teaching resources specific for a modern techno-centric educational system). The results show that: 22 of the subjects (10.5%) choose to use a combination of computer/ laptop – Internet, other 22 subjects (10.5%) choose computer – software, combination and 33 subjects (15.2%) choose computer-laptop – software-video projector – Internet combination, than 14 subjects (6.4%) computer/ laptop – software- internet and other 14 subjects (6.4%) vote for computer –sites – Internet. Therefore on top positions of the choosing list we find different combinations of teaching resources belonging to the new communication technologies (ITC). From 218 investigated subjects, 147 (67.3%) declare they use teaching resources belonging to the new technologies at least once a week. Of those, 21 subjects (9.6%) declare they use modern technologies once a day, 58 subjects (26.6%) say they use the ITC resources combinations once or even twice per day and 68 subjects (31.2%) declare they use ITC resources 1-2 times per week. Teachers were questioned if they followed or not training classes of ITC (143 subjects (65.69%) answered they followed ITC classes while the other 73 subjects (32.56%) declare they didn't participate at any ITC training).*

**Key words:** *teachers, pre-primary education, teaching methods, new information technologies*

New technologies bring into the spot light a large variety of technologies linked to computer and internet. Some specialists believe that new media can be considered such as blogs, video games, virtual worlds, encyclopedias and wikis, but also mobile, interactive televisions, chats and e-mails. Others argue that blogs and virtual worlds belong in the category of social media; it encourages the formation of virtual communities and social networked (N. Gane, D. Beer, 2008). The new means of communication duet o its interactivity, have a great impact on students' development, learning process,, communication skills or in the way the establish their own scale of values.

Bransford and Brown (2000) consider new technologies to be consistent with the principles of learning and they promise a better education, unlike conventional instructions. The use of new information technologies provides efficient and time effective access to the learning materials. Meta-analysis studies on media research shows that students obtain significant benefits in learning by using new information technologies. However, Bransford and Brown (2000) warn that the positive impact of technology does not come automatically; it depends highly on how teachers use these technologies in their classes. Other studies suggest that the use of these technologies depend on the medium of instruction, the instructional strategies, and especially on the learning materials (Clark, 1983, quoted by T. Anderson, 2008). R. B. Kozma (1991), on the other hand, argues that the particular attributes of the computer are necessary to bring real models and simulations in the learning process. No computer, itself, makes the students learn, but the design of real educational situations, simulations and interactions with these technologies are very important to students (RB Kozma, 1991).

The computer is the only machine that has processing capability and provides students with instructions. It maintains utility and positive characteristics, depending on the purpose and use of the time allotted virtual activities (Clark, 2001).

The constructivist model articulates an approach that considers how to incorporate new communication technologies (mobile and video) in the design of learning process (Smith, 2011). The teacher is not a fundamental element of the model, but still remains the planner, the designer and the facilitator of learning. Teacher designs the learning model need to anticipate the learning outcomes (Anderson et al, 2001), to stimulate the learning activity and to motivate students to set up learning objectives and to support and guide their learning experiences (Mayer, 2004). All these to so that the video communication to be used for much more than the transmission of information (Smyth & Bossu, 2006; Smyth & Zanetis, 2007).

More adaptable to the transformation under the impact of technology development in the last decades are children and young people – also called the ”Net generation”, ”digital generations”, ”gamers` generation” or ”M generation” (Carstens, Beck, 2005; Montgomery, 1996; Tapscott, 1999; Prensky, 2001; Oblinger, Oblinger, 2005; Pedró, 2006; Rideout et al, 2005; Prensky, 2001) – because of the increased capacity to adapt change and of the possibility of allocating a higher time interval compared to adults, to familiarize with means of information and communication and of testing the multiple functionalities and uses thereof. Most them being raised in families and schools where digital equipments are abundant, which forced them to learn from an early childhood how to these technologies- both because they were accessible and in order to align with the “digital inclusion” (Livingstone şi Helsper, 2007: 671). It is a generation that, in education, feels more comfortable with an adaptative, collaborative and interactive learning environment (Livingstone şi Helsper, 2007: 671). As for, their social attributes, pupils seem to use their free time access different mass - media channels generally and especially to use digital mass-media (Pedro, 2006; Prensky, 2001; Rideout et al, 2005).

There are arguments that computer games significantly contributed to the training of knowledge, skills and attitude and commitment improvement. (Passey et al, 2004; McFarlane et al, 2012; Sandford et al, 2006). The use of interactive simulations and of games brought higher and better cognitive earnings towards learning attitudes, compared with the use of traditional teaching methods (Vogel et al., 2006). The internet is associated with different learning opportunities, from access to educational and informational resources in various fields to active participation to civic participation, fostering creativity and communicational skills development, promoting artistic and economic environments, often easy spread of information regarding health issues of general interest. The criticism regarding the use of informational technologies in teaching activity concentrated in particular on the lack of groups’ control, on the lack of statistical data, on omitting important demographic details and on interventions that have not been described in detail (Randel et al, 1992; Condie & Munro, 2007). The excessive use of new informational and communication technologies can generate personal and cultural changes, especially when the lack of supervision from parents combined with the temptations of virtual space – violent games, luck games, inappropriate images – can distract children attention from the educational and recreational opportunities.

In the last three decades, the digital technologies were introduces within and out the teaching classes. Digital technologies are still used inconsistently in education. From “radical optimism” (Inge, 2003) to pessimism (Dienstag,

2006), the use of new informational technologies in education is still an open subject.

The research aim concentrated on identifying and analyzing the didactical activities from the point of view of teaching resources used in the teaching process, teaching resources were split into traditional teaching resources and teaching resources referring to the new informational technologies, from the perspective of their frequent use and of their functions. Research hypothesis: 1. The teaching resources belonging to the new informational technologies are preferred to be used by the teachers, in different combinations. 2. Teachers use the new informational technologies at least once a week and they believe that their most important function is to facilitate or deepen the knowledge. In research, the main research method we used was the questionnaire based survey, the survey being created on 3 dimensions: types of teaching resources used in the teaching process, the use of teaching resources in teaching and the use of the new technologies in teaching activity. The survey was developed and validated especially for these research (Alpha Cronbach=0.7671).

The research lot consisted of 218 teachers from preprimary educational system in Romania. 97.2% (212 subjects) of teachers were women while only 2.8% (4 subjects) represented the men population. Depending on the environment were kindergarten lies we have as follows: 75.2% (164 of subjects) from urban areas and the rest of 24.3% (53) rural areas. If we look at the research lot from the age perspective we have 41.7% (91 subjects) aged between 30-39 years old, 21.1% (46 subjects) having between 20-29 years old, 18.8% (41 subjects) with ages over 50 years old and 18.3% (40 subjects) aged between 40-49 years old. Another distinguishing criterion used to analyze the research lot was the teaching degree: 37.6% (82 subjects) had junior position, 33% (72 subjects) of teachers had the first didactic degree, 15.6% (34 subjects) had second didactic degree and 13.8% (30 subjects) hold permanent teaching certification. Regarding teachers' working experience most of the subjects 69 (31.7%) of them have between 1 to 4 years teaching experience, 53 subjects (24.3%) have between 10 to 14 years of experience while other 42 subjects (19.3%) have over 20 years working experience, 28 teachers (12.8%) have a work experience variable between 5 to 9 years and 26 of them working for more than 15 years but less than 20 years. Another investigated indicator was the graduated studies: 111 of subjects (50.9) have BA, 85 of the researched population (39%) graduated MA studies and 22 of teachers (10.1%) graduated high school. Because of the research aim we also aimed to identify how many of them graduated ICT training course and the results show that 143 of teachers (65.6%) graduated a ICT training while the other 75 (34.4%) of subjects didn't participated in any training on ICT subject. Regarding

teachers' monthly income we found that 61 teachers (28%) earn 400 Euro, 9 teachers (4.2%) earn over 400 Euro, 88 subjects (40.3%) earn 350 Euro, 59 teachers (27.1%) have 300 Euro and 1 subject saying the earns 250 Euro.

First research hypothesis: teaching resources belonging new communication technologies are better used in different combinations by the teachers. The results for the item that assess this aspect show that 22 subjects (10.5%) choose a computer/ laptop – Internet combination, other 22 subjects (10.5%) choose computer – software combination, 33 teachers (15.2%) choose computer/ laptop – software – video projector – Internet option, 14 subjects (6.4%) choose a computer / laptop – software – Internet combination and other 14 teachers vote for a compute- sites – Internet combination. Teachers who use the singular means of new communication technologies are as follows: 12 subjects (5.6%) that choose computer / laptop, 12 subjects (5.6%) that choose video games and 4 subjects (1.8%) choosing educational software. We can easily observe that on the top positions that teachers aim for teaching resources belonging to the new communicational technologies. If you analyze the situation after taking into consideration the age criterion we see that: teachers aged between 20 to 29 years old choose a computer / laptop – video projector combination (5 choices), subject with a ages between 30 to 39 years old chose a computer / laptop – educational – software combination (12 choices) or a compute – laptop – software – video projector – Internet (14 choices), a computer / laptop – Internet combination (8 choices); subjects with ages between 20 to 49 years old chose as follows educational software – video projector (4 choices), video games – computer / laptop – video projector (4 choices) while the subjects from the last category aged over 50 years old choose: games – computer / laptop – video projector – Internet (4 choices).

The combinations of teaching resources belonging to the new communication technologies were viewed in terms of teaching degrees. Thus, the following results were recorded: debutant teachers chose educational software -projector combination (4 choices), computer /laptop – projector option (4 choices), computer / laptop – educational software (13 choices), computer / laptop – educational software – projector (6 choices), computer / laptop – video – projector - Internet (6 choices), educational software – Internet (2 choices), computer / laptop – video projector – video games (9 choices); subjects being in a junior position regarding the didactic degree chose: educational software – projector combination (4 choices) and teachers holding the second didactic degree chose computer / laptop – educational software – video projector – Internet (6 choices), video games – computer / laptop – video projector – Internet (2 choices) and choose subjects with didactic grade one computer / laptop – educational software – projector – Internet (7 elections), computer /laptop - Internet (9 choices), computer /

laptop – educational software – Internet (7 choices), video games – computer / laptop – video projector – Internet (4 choices), video games – computer / laptop – educational software – projector (6 choices).

The combinations regarding the teaching resources belonging to the new communicational technologies were also seen from the point of view of the teachers' experience in the teaching field. Subjects with an experience between 1 to 4 years in teaching chose educational software – video projector combination (4 choices), computer / laptop – video projector (3 choices), computer / laptop – educational software (3 choices), computer / laptop – educational software – video projector (9 choices), computer / laptop – video projector – Internet (5 choices), software – Internet (4 choices), computer / laptop – educational software – video projector – Internet (5 choices), video games- computer / laptop – video projector (4 choices); research subjects with a teaching experience between 5 to 9 years chose video games – computer / laptop – video projector – Internet (2 choices); subjects with a teaching experience between 10 to 14 years choose: educational software – Internet (2 choices); subjects with a teaching experience between 15 to 20 years choose computer / laptop - Internet (6 choices), video games – computer laptop – video projector (3 choices), computer – laptop – Internet (6 choices), video games – computer / laptop – video projector (3 choices), computer / laptop – educational software – Internet (8 choices) and teacher with more than 20 years in the teaching activity choose: video games – computer / laptop – educational software – video projector (4 choices), video games – computer /laptop – educational software- video projector – Internet (3 choices).

There were found correlations between: magnetic whiteboard and classic blackboard / markers whiteboard .559** (p-0.01), blackboard /flipchart and chalk / markers .646** (p-0.01), TV and video – games .696** (p-0.01), TV and educational sites .609** (p-0.01).

After applying ANOVA following results were found: F (26)=2.115, p<.002 between audio recordings and ICT teaching resources, F (26)=2.033, p<.004 between computer / laptop and ICT teaching resources.

Research hypotheses 2: . Teachers use the new informational technologies at least once a week and they believe that their most important function is to facilitate or deepen the knowledge. From 218 investigated subjects 147 (67.43) say they use teaching resources included in new communicational technologies at least once a week. Of those: 21 subjects (9.6%) say they use the resources 1 time a day, 58 subjects (26.6%) say they use the resources 1 – 2 times a day and 68 (31.2%) subjects say they use internet 1 time per week.

Teachers were also asked if they followed ICT training (143 subjects – 65.69% declared they participated at such trainings, and 73% said they

didn't take any training regarding ICT). Gratifying is that most teachers who said they had a ICT mostly use teaching resources indexed in the new communication technologies list (of the 143 subjects who completed training ICT, 98 of them - 68.53% use the new technologies as follows: 14 subjects say they use 1 time a day, 43 subjects say they even use 1-2 times a day and 41 subjects say they use 1-2 times per week). On the other hand it is sadly to see that the person who said it that completed ICT training doesn't use the new communicational technologies in the teaching activity. If we analyze the use of teaching aids belonging to the new communication technologies according to respondents ages we find that: 21 of the subjects aged 20-29 use them 1-2 / week; 23 subjects between the ages of 30-39 years old are use them for 1-2 / week, respectively, 22 of the subjects using them for 1-2 / day; 14 of the subjects over 50 years use them 1-2 / day and 11 subjects use them 1-2 / week; 14 subjects aged between 40-49 years use them 1-2 / day and 21 subjects use them 1 / day while 13 subjects 1-2 week. It seems that teachers over 50 years old adapted well and use the new communicational technologies in their teaching activity.

If we analyze the use of teaching resources belonging to the new communication technologies in terms of didactic degrees held by our respondents note that 38 of the debutant subjects use them 1-2 / week; 12 of the subject holding a permanent didactic degree use them 1-2 / week, respectively, 13 of the subjects with the second didactic degree use them 1-2 / day; 29 of the subjects with the first didactic degree use them 1-2 / day and 22 subjects 3-4 / week. It keeps the same ascending trend regarding the use new communication technologies means in teaching activities referring to the teachers holding the first didactic degree.

Analyzing the use of teaching resources belonging to the new communication technologies in education from the perspective of subjects' teaching experience we can see that 34 of the subjects with 1-4 years teaching experience use them 1-2 / week; 11 of the subjects with 5-9 years experience in educational field use them 1-2 / week, respectively, 21 of subjects teaching within a period of 10 to 14 years teaching experience uses 1-2 / day; 8 of subjects with 15-20 years in teaching use them 1-2 / day, 22 subjects use them 3-4 / week and 16 subjects use them 1-2 / day.

One of the items in the questionnaire investigated the perception of teachers that use the new communication technologies from the perspective of their main functions. Four functions were investigated: facilitation / deepening of knowledge, training / study skills and abilities, training / study of personality traits and the support function of the operations of thinking. This item was a multiple choice. We present further results: the function of facilitating / deepening of knowledge have recorded 122 selections (56%) for grade 10 (the highest grade of hierarchy); function training / study skills and

abilities were recorded 78 selections (35.8%) for grade 10; function training / study of personality traits were recorded 66 selections (30.3%) for grade 9; the support function of thinking operations there were 98 elections (45%) for grade 10.

The portrait of teachers that chose the facilitation / deepening of knowledge for the new technologies is as follows: are ITC graduates (79 subjects – 64.75%), have 1 to 4 years teaching experience (35 subjects 28.68%), hold the fist didactic degree (41 subjects – 33.6%) also hold a junior didactic degree (41 subjects – 33.6%) and have ages between 30 to 39 (47 subjects-38.52%).

The portrait of teachers that chose the training / study skills and abilities for the new communicational technologies is: they graduated ICT training (59 subjects – 75.64%), have between 1 to 4 years of teaching experience(28 subjects – 35.89%), hold the first teaching degree (34 subjects – 43.58%) and have a age between 30 to 39 (47 subjects – 43.58%).

The portrait of teachers that chose the training / study of personality traits for the new communicational technologies is: teachers that graduated ICT trainings (48 persons – 73.84%) and have a teaching experience between 1 to 4 years (25 subjects – 38.46%), hold a junior didactic degree (30 subjects-46.15%) and have ages between 30 to 39 (26 subjects- 40%).

The portrait of teachers that choose the support function of the operations of thinking for the new communicational technologies: teachers that have graduated ICT trainings (61 subjects – 42.65%), with an experience between 1 to 4 years in teaching (36 subjects – 36.73%), holding a junior didactic degree (39 subjects – 39.79%)

We found a correlation significant correlations between: the facilitation / deepening of knowledge, training / study skills and abilities .546** (p-0.01) and between the training / study skills and abilities and training / study of personality traits .839** (p-0.01), also between training / study skills and abilities and training / study of personality traits and the support function of the operations of thinking .768** (p-0.01).

After ANOVA analyses the results show that $F(4)=3.802$, $p<.005$ between boards use and the support function of the operations of thinking, $F(4)=3.961$, $p<.004$ between board and the function of training / study of personality traits.

Conclusion: The research aimed to investigate the teaching activities from the perspective of the teaching resources, resources that were split into: classical teaching resources and teaching resources belonging to the new communication technologies. The results confirm the first hypothesis of research: teaching resources belonging to the new communicational technologies are better used in different combinations by teachers: 22 subjects (10.5%) choose a computer / laptop combination – Internet, 22

subjects (10.5%) choose a computer –software combination, 33 subjects (15.2%) choose the computer / laptop – software –video projector– Internet combination, 14 subjects (6.4%) choose a computer / laptop –software – Internet combination, while other 14 subjects (6.4%) choose a computer / laptop –sites – Internet combination. Right from the first choosing positions we identify a combination of teaching resources indexed as new communicational technologies.

The second research hypothesis: teachers use the new informational technologies at least once a week and they believe that their most important function is to facilitate or deepen the knowledge is also confirmed by the research results. From 218 investigated subjects 147 (67.43%) say they use teaching resources indexed as new communicational technologies at least once a week. Of those 21 subjects (9.6%) say they use them 1/day, 58 subjects (26.6%) say they use iit 1-2 /day and 68 subjects (31.2%) say they use 1-2/week. Teachers were also questioned if they graduated any ICT training and 143 (65.60%) of subject answered positive while 73 (32.56) of subjects said they didn't followed any ICT training

## References

Anderson, L. W., Krathwohl, D. R., Airasian, P. W., Cruickshank, K. A., Mayer, R. E., Pintrich, P. R., et al (2001). A taxonomy for learning, teaching and assessing: a revision of bloom's taxonomy of educational objectives. New York: Longman.

Anderson, T. (2008). The theory and practice Of online learning. Edmonton: Au Press. .

Bransford, J.D. şi Brown, A.L., Cocking R.R. (2000). How People Learn: Brain, Mind, Experience, and School: Expanded Edition. Washington, DC: The National Academies Press.

Carstens, A. & Beck, J. (2005). Get ready for the gamer generation. TechTrends: Linking Research & Practice to cognition and design principles. British Journal of Educational Technology 43, 4, 561–575.0

Clarke, A.C. (2001). A Space Odyssey. New York: Penguin Books.

Condie, R. & Munro, B. (2007). The impact of ICT in schools: a landscape review. Coventry: Becta. Retrieved

Gane N., Beer D. (2008).The New Media. New York: Berg Editorial Offices.

Kozma, R.B. (1991). "Learning with media." Review of Educational Research, 61(2), 179-212.

Mayer, R. E. (2004). Should there be a three strikes rule against pure discovery learning?: the case for guided methods of instruction. American Psychologist, 59, 1, 14–19.

McFarlane, A., Sparrowhawk, A. & Heald, Y. (2012). Report on the educational use of gaming in education.

Montgomery, K. (1996). Children in the digital age. The American Prospect, 7, 27. Available in http:// www.prospect.org/cs/articles?article=children_in_the_digital_age.

Oblinger, D. & Oblinger, J. (2005). Educating the net generation. Washington, DC: Educase.

Passey, D., Rogers, C., Machell, J. & McHugh, G. (2004). The Motivational effect of ICT on pupils. London: DfES/University of Lancaster. Retrieved May 29, 2009, from http://www.dfes.gov.uk/research/data/ uploadfiles/RR523new.pdf.9

Pedró, F. (2006). The new millennium learners: challenging our views on ICT and learning. Paris: OECD-CERI.

Prensky, M. (2001). Digital natives, digital immigrants. On the Horizon, 9, 5, 1–6.

Randel, J. M.,Morris, B. A.,Wetzel, C. D. &Whitehill, B. V. (1992). The Effectiveness of Games for Educational Purposes: A Review of Recent Research.," Simulation & Gaming, vol. 23, iss. 3, pp. 261-276, 1992.

Rideout, V., Roberts, D. & Foehr, U. (2005). Generation m: Media in the lives of 8–18 year-olds.Menlo Park, CA: Henry Kayser Family Foundation.

Sandford, R., Ulicsak, M., Facer, K. & Rudd, T. (2006). Teaching with games: using commercial off-the-shelf computer games in formal education. Bristol: Futurelab. Retrieved June 3, 2008, from http://www.

Smyth, R. & Bossu, C. (2006). Investigating broadband videoconferencing possibilities for teaching. Paper presented at the Higher Education Research Development Society of Australasia Conference. Conference, Sydney, July 4–6.

Smyth, R. & Zanetis, J. (2007). Internet-based videoconferencing for teaching and learning: aCinderella story. Distance Learning, 4, 2, 61–70.

Smyth, R. (2011). Enhancing learner–learner interaction using video communications in higher education: Implications from theorising about a new model. British Journal of Educational Technology 42, 1, 113–127.

Tapscott, D. (1999). Growing up digital: the rise of the net generation. New York: McGraw-Hill.

Vogel, J. F., Vogel, D. S., Cannon-Bowers, J., Bowers, C. A., Muse, K. &Wright, M. (2006).

Computer Gaming and Interactive Simulations for learning. Journal of Educational Computering Research. 34, 229-243.