

The teacher's role in effectively implementing ICT into the teaching-learning process with regard to social interaction

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Abstract: *This paper describes the key role teachers are in effectively implementing ICT into the teaching-learning process. The obstacles teachers are facing while integrating computers into their lessons are analyzed and solutions are given. Effective ICT integration must happen across the curriculum, while using advanced pedagogy in order to enhance the learning process. In particular, it must support four key components of learning: active engagement, participation in groups, frequent interaction, and connection to the real-world. Effective technology integration is achieved when the use of technology is routine and supports curricular goals. Cooperative learning and character development supports the social and emotional development of students and prepares them for success in the modern workplace.*

Rezumat: *Acest articol descrie rolul-cheie al profesorilor în aplicarea eficiententă a TIC în procesul de predare-învățare. De asemenea, sînt analizate obstacolele cu care se confruntă profesorii în timp ce integrează computerele la lecție, fiind oferite anumite soluții. Integrarea eficientă a TIC trebuie să fie stipulată de curriculum, în timp ce pedagogia avansează căi de îmbunătățire a procesului propriu-zis de învățare. În special, aceasta trebuie să sprijine patru componente cheie ale învățării: angajarea activă, participarea în grupuri, interacțiunea frecventă și conexiunea cu lumea reală. Integrarea eficientă a tehnologiei se produce atunci cînd aceasta devine o simplă rutină și sprijină obiectivele curriculare. Învățarea prin cooperare și dezvoltarea caracterului facilitează dezvoltarea socială și emoțională a elevilor și îi pregătește pentru viitorul succes la un loc modern de muncă.*

Keywords: *Effective ICT integration, successful use of ICT, ICT integration, Teachers integrating ICT, ICT proficiency.*

Teachers are essential to support learners as they interact [Yackel, 2002 in 1]. Moreover, ICT loses its advantages when lacking the correct guidance [5]. Since it is often hard for teachers to give up old habits in favor of new, they need support and guidance [Borko, Davinory, Bleim & Cumbo, 2000 in 1]. In their research, Akkus, Seymour & Hand [1], developed a framework for teachers to combine different aspects of mathematics teaching and learning which includes "embedded writing-to-learn strategies (MRA)" [1, p. 53]. They found out that teachers who used this framework improved their ability to support dialogue interaction across time along with other pedagogical skills important for promoting dialogic interaction. Vadmani [16] agrees, she claims that when integrating technologies the teacher cannot simply teach. Training must be provided both to teachers and to teacher students. Moreover, since the new technologies of today, are the old technologies of tomorrow, it is important for teacher-collages to conduct a continuous monitoring after new technologies and collaborate these technologies to appropriate pedagogies. These pedagogies should be taught both to teachers in schools and teacher students.

Forkush Baruch [8] urges to take into consideration that as far as technology, it is a whole system to learn, including characteristics and the way it works. Whereas pedagogically, this is actually a new specialization, of matching the technology and best use it to empower teaching and learning. The success of integration of computers depends on optimal combination between technology and pedagogy, in order to promote collaboration and peer-learning.

In its 2009 report "Creating Effective Teaching and Learning Environments-first results from TALIS", the OECD [19] found out that across the 23 participating countries, the aspect of teachers' work frequently rated by teachers (25%) as an area of high development need was "Information and communication technology (ICT) teaching skills" [19, p. 61]. The report concludes that in light of the 2001 OECD Survey that highlighted the lack of use of ICT in classroom instruction but noted the substantial amount of professional development that had taken place in this area [19], "that school teachers identify such a high level of need in the use of ICT for instruction almost 10 years later may be a reflection of the speed technological change which teachers must keep pace with. This may signal a continuing challenge for schools and teachers to keep up to speed in a fast-moving area and to fully exploit technology for the benefit of teaching and learning. But it may also confirm studies which indicate a lack of capacity building in terms of how best to use ICT in the classroom" [19, p. 61].

The report reveals that the reasons that had prevented the teachers from participating in more professional development (given by the teachers themselves) were mainly: conflict with work schedule, no suitable professional development and family responsibilities. This report also provides a solution to this problem. It recommends compulsory professional development: "Some professional development may be deemed compulsory because the skills and knowledge the development activities aim to enhance are considered important for teacher quality. In some cases participation in such activities may even be required for teacher certification" [19, p. 64].

Ben Peretz [3] adds that both global external factors and local cultural social factors are perceived as having an impact on curriculum and teaching, and therefore directly affect teacher trainings. She thinks that the voice of local procedures must be heard alongside the attention to global changes and ways. One of the means suggested to navigate between the pressures, sometimes contrasted ones, is to build parts of the educational policy in the local level, by professional educators who do not ignore the impact of socio-cultural ties over education. The opponents claim, that the development efforts invested in ICT learning focus especially in the teachers and not the learners. These efforts consider lesson plans and presenting the material using new technologies, instead of focusing on the question how students learn using new technologies [Alexander & McKenzie, 1998; Bound & Prosser, 2002, in 5].

Technology has not remained static over time, newer technologies are being developed that may soon replace the old ones. Cuban [1986, in 12] has shown that educational technologies of the 20th century (e.g. motion pictures, radio and TV) generally have not lived up to their potential. In conclusion, Knight & others [12] recommend educators to continue to use technologies to their advantage, since it can help them extend interaction within and beyond the classroom, and thus to increase opportunities for collaborations.

Pineteh [14], supports the recommendation above. Since he rightfully believes that traditional methods of teaching are still valuable given the differences in the learning styles and technological experiences of the learners, he suggests that the most expedient teaching approach will be "complementarily" [14, p. 85]. Pineteh's research [14] shows that using his approach can promote quality peer interactions and collaborative learning. He also reminds us that this current generation of learners is more technologically conscious and brings to school and university "a wide range of life experiences and interests" [Lillis, 2003 in 14, p. 192]. For instance, learners spend hours interfacing with their peers on computer or mobile devices [Carter,

Foulgar & Ewbank, 2008; Saeed, Yang & Sinnappan, 2009, in 14; 20]. As a result of the increasing presence of technology, educators are forced to be more imaginative and it encourages them to use teaching methods that are more stimulating and appealing to learners [14]. Pineteh [14] concludes Yang's research [17]: "This paper lends itself to the Vygotsky-based theory that learning is a process of social constructivism, shaped today by the quality of virtual relationships and dialogue engagements with peers and educators inside and outside the conventional classroom" [14, p. 88]. Critics of technology in education contend, that overexposure to social networks (e.g. facebook), infantilizes learners, affects academic performance and sometimes creates misleading impressions about learning [Considine et al, 2009; Scharber, 2009 in 14; 20]. Both Wintour [20] and Cross [2004, in 14] warn that virtual interactions, that include connecting with a wider population of peers, has had negative implications for the way learners socialize online and in the classroom.

Many researchers discussed the question "Who is a good teacher?" and although it is difficult to reach agreement, three categories are recognized [Hinchey, 2010 in 10]: 'Teacher quality', which is namely teacher's characteristics. 'Teacher performance', what he does inside and outside the classroom (such as interaction with learners), and 'teacher effectiveness', his influence on learning among his students (such as their achievements and motivation). Studies have shown that the main factor for creating significant contribution of technology to the learning process in school is the number of teachers who use technology wisely [9]. Therefore, she recommends, it is very important that investment in technology, will also include as integral part-teacher training: Teachers that will use technology wisely as a contributor tool to pedagogy. But technical training is not enough, in order to effectively integrate technology into teaching, training should emphasize how and when technology is integrated effectively for the achieving of specific pedagogical goals. A variety of methods for effective integration should be presented, so that the application will be pedagogical and not technical. Training should also emphasize simple tools, those that the teachers can integrate without the need for complex preparations [9].

Leading technology teachers should be allowed to serve as a model and advice their colleagues. It is also important to understand that a single training is not enough to make the necessary change. It takes an ongoing annual process, accompanied with technological and pedagogical support. The greater time invested in the experience of teachers' use of technology, the more their self-confidence will increase and the more possibilities of technology and appropriate ways to incorporate it will be open for them [9].

Dresler & colleagues [6], while trying to answer the question "what is the behavioral profile that is characteristic for teachers that are implementing the ICT pedagogy at its best?".

Found the answer in Ames' [1992 in 6] six elements called TARGET:

- **T**ask – The value of a task is assessed by its importance, interest to the student, usefulness or utility, authenticity, and the cost in terms of effort and time to achieve it.
- **A**uthority – Learning can be based on the authority of the teacher that dictates its pace and frames. Authority that constitutes a significant figure for the students, in mediation processes of the learning. The educator is not just a teacher he is also a learner.
- **R**ecognition – Adapting the curriculum to the learning style, the social emotional needs, the cognitive abilities, desires and other personality variables.
- **G**rouping – Strategies for teaching – learning – assessment based on the cooperative of teacher – learning – Group provide the learners opportunities for social interaction while experiencing many different dialogues. Learning outcomes reflect the thinking processes and actions of the entire group (shared cognition), and not just the individual learner.
- **E**valuation – Using a variety of alternative assessment methods – corresponding to the objectives of the assessment and evaluation subjects. Intelligent use of evaluation findings to improve teaching and learning processes.
- **T**ime – Reference to time in designing the curriculum, such as: time allotted number of lessons per week, time management according to the assigned tasks.

Helping educators to change, is the key to fostering ICT integration, and some researchers have identified educational technology as a catalyst for bringing educational change [18]. The problem according to Newhouse, Trinidad and Clarkson is that despite new cognitive approaches to learning such as constructivism, the education system is stuck in the behavioral paradigm of the industrial age. While some teachers cope well with change and enjoy risk taking opportunities, many teachers are reluctant to change.

Therefore, Rogers [2000 in 18] states, it is necessary to understand where teachers are in terms of their level of ICT adaption, to understand the obstacles they are confronting. These obstacles include the lack of funding,

teacher training, limited time for teacher planning, lack of support or infrastructure, and lack of vision as to what can technology contribute. For ICT to be effectively adopted into school, Newhouse, Trinidad and Clarkson [18] continue, planning is vital. The vision, goals and objectives of the technology program must be imbedded in that of the school [Cole, 1999 in 18].

Beauchamp [2] claims that teachers are facing challenges and opportunities while introducing a new ICT (such as the interactive whiteboard) in the classroom. Despite the benefits to be gained from exploring the new technology [Harris, 2002 in 2], there is necessary investment in time, effort, new learning and willingness to change existing teaching strategies [Keeler, 1996 in 2]. Therefore, it is not surprising that although teachers may start from the same starting point when using a new technology, it is possible to identify a range of competencies and pedagogic practice. In his findings, Beauchamp [2] distinguishes five stages which delineate the transition from beginner to synergistic operator of new ICT using the interactive white board (IWA) as a demonstration.

Beauchamp [2] reinforces the claim that if schools are to invest in new technological tools, they should also be aware to the investment needed in preparing teachers for their new role, both in terms of technical competence and classroom pedagogy. He also points out the element of time, time to assimilate the lessons learned by teachers into their practice, "until they feel confident in being able to cope with most facets of a program and other features of the technology" [2, p. 346]. However, he mentions, teachers will progress at their own speed and their training requirements will need to be met in a flexible and supportive environment [also Davis, Preston, & Sahin, 2009 in 2]. "It does take time for an educator to complete this journey and to develop a vision of what can be done with ICT" [18, p. 43]. Very often this vision is developed first with the personal use of ICT, and later with appropriate professional development providing good models of best practice [18].

The implementation of technology in schools occurs in one of the two following models [Avidov-Unger and Eshet-Alkalai, 2011 in 4]: *Islands of Innovation*, which encompasses only part of the educational organization, and *Comprehensive Innovation*.

Rogers [2003 in 4] in his *diffusion of innovation* model describes 5 groups of innovation adapters: innovators (2.5%), early adopters (13.5%), early majority (34%), late majority (34%), and laggards (16%).

Blau and Peled [4] found similar results in the field of education in a research conducted in Israel, 2011. They claim that the literature emphasizes the great importance of personal characteristics of teachers, in high levels of technology adaption [Becker, 2000 in 4], but there is no proper appreciation as to their viewpoints regarding technology [McCormick & Scrimshow, 2001 in 4], since changes in these viewpoints can help overcoming obstacles in implementing technology in schools [Hew & Brush, 2007 in 4]. Blau and Peled [4], also indicate the importance of holding in school, an ongoing training program to support the teachers in effective use of their computers as a tool to create meaningful learning. Finally, Blau and Peled's research [4] raises the issue teachers complain about, of time consuming preparing digital materials for the technology based lessons. These findings emphasize the importance of preparing digital materials by content developers.

Hennessy and Colleagues [11] also indicate that there is substantial evidence that if used appropriately, ICT can be an effective tool in supporting teaching and learning. They agree with other researchers mentioned here that since ICT's introduction into schools does not by itself improve the quality of education, the pedagogical and technical expertise of the teacher is absolutely critical. They too, believe that teacher development is the key to effectively implementing policy and curricula, to using ICT to enhance teaching and learning, and to produce qualified teachers, therefore: "Teachers who lack the chance to develop professionally in the use of modern ICT feel under threat. The relevance of a teacher in the 21st century is determined by their willingness to develop in this way" [11, p. 42].

Similarly to Newhouse, Trinidad and Clarkson [18], Hennessy and Colleagues [11] claim that ICT is most effectively used as a learner centered tool, instead of within a more traditional pedagogy. Although they agree that it is teachers' attitudes, expertise, lack of autonomy and lack of knowledge to evaluate the use and role of ICT in teaching that are important factors delaying teachers' readiness and confidence in using ICT support. Hennessy and Colleagues [11] think that there is also a general inadequacy of learning resources, course curricula and other learning materials that involve ICT use.

The biggest obstacles according to Hennessy and Colleagues [11], identified by teachers participating in the 1998-1999 survey, were the lack of time available in classes, and their own schedules for planning; in addition to the lack of national policy on the use of computers in schools [Kozma, McGhee, Quellmalz, & Zalles, 2004 in 11]. Therefore, they recommend, national policies need to make more commitment to helping teachers effectively integrate ICTs into the classrooms "by aligning curricula, exams, and incentives with educational outcomes that they hope to gain" [11, p. 43]. They also believe that teachers can take time to discover that ICT does not mean extra work rather it makes their work easier and suggests that more competent learners can

be a useful resource for their peers.

Hennessy & Colleagues' conclusion of the research that focused on the Sub-Sahara Africa is that ICTs revolutionize the quality of learning when carefully integrated into the classroom, where teachers' primary barrier to ICT is the lack of relevant preparation, which results in low proficiency in using ICT and a general lack of knowledge about technology in teaching and learning. This eventually leads to lack of subject teachers trained to integrate technology into learning in their areas.

Mellar& Collegues [13] continue the idea, claiming that in order for teachers to be effective in supporting the development of ICT skills and confidence, they should encourage collaborative learning, learner autonomy-so that they will have time to get to know their learners better and adapt their teaching to their learners' need, in addition to using a wide variety of technologies to construct (usually shared) outcomes.

THE CURRENT RESEARCH

The current experiment focused on two sixth grade classes in an elementary school in Israel. It was carried out comparing reciprocal relations activities taking place within three different classrooms: the traditional classroom, the computerized classroom, and the "classroom maximizing the effectiveness of computers." Seeking to examine the most effective use of the opportunities provided by integrating the computer into the classroom to promote social processes among the students, led me to use the action research methodology, that enabled me to be involved directly in the activity being studied, analyzing existing practice and identifying elements for change and primarily, to improve it [7; 15].

Out of the 20 teachers teaching in school, four teachers were interviewed regarding their teaching characteristics, their use of computers in their classrooms, and the social processes undergoing by their students. All four teachers described themselves using the same personal characteristic: innovative, creative, effective and updated. Three even added that they are not a risk taker person. Two teachers had limited ICT skills therefore it is not surprising that they were the teachers that integrated technology ineffectively. The two remaining teachers that integrated technology into their lessons effectively had partial or strong background in ICT. It is interesting, considering the fact that all four teachers acknowledged the importance of integrating technology into the learning-teaching process, and also gave the reasons to support it, that only the effective teachers saw in the ICT integration a necessity. With reference to the skills an effective integrating ICT teacher should have, the answers varied. Although all four teachers agreed that being updated is an important characteristic, only two talked about being innovative. An interesting point Teacher B presents, is that although she does not believe that she should be a risk taker in order to integrate ICT in her lessons; She does believe it is an effective ICT teacher characteristic. Finally, it is encouraging to know that all four teachers participate in teachers' training and hope to develop in the technology field.

CONCLUSION

Technology is touching almost every part of our lives. Yet, I believe, that most schools stay far behind when it comes to integrating technology into the teaching-learning process. Many teachers are just beginning to explore the contribution technology offers for teaching and learning. Effectively used, technology will help students acquire the skills they need to survive in a complex, highly technological knowledge-based society. Effective ICT integration must happen across the curriculum, while using advanced pedagogy in order to enhance the learning process. In particular, it must support four key components of learning: active engagement, participation in groups, frequent interaction, and connection to the real-world. Effective technology integration is achieved when the use of technology is routine and supports curricular goals. Furthermore, technology summons social environments for learning, students who work together on project teams, learn to collaborate, communicate, and resolve conflicts. Cooperative learning and character development supports the social and emotional development of students and prepares them for success in the modern workplace.

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