

## **Technology in Teaching and Learning Activities: Benefits and Challenges**

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### **ABSTRACT**

*The development of technology creates enormous changes in every aspects of life, including education. It influences the design of curriculum, learning method, learning media, etc. This influence has brought many positive impact toward education, such as enhancing students' motivation in learning, promoting cooperative learning, promoting students autonomy, increasing the effectiveness of teaching, and providing diverse experience. Yet, educators also face some challenges, such as teachers' readiness, facilities availability, and students' nature. Some efforts are needed to tackle the challenges in order to gain the best part technology can give to education.*

**Keywords:** Education, Technology integrated teaching and learning, Benefits, Challenges

### **INTRODUCTION**

The development of technology has been one of key elements of world globalization. This development creates changes in tremendous aspects of life, including education. In education, where its goal deals with shaping human being, these changes should be carefully adapted. Thus the adaptation has to go hand in hand with the basic objective of education.

In general, the development of technology affects education in obvious parts like in the design of curriculum, teaching method, approach, as well as teaching media (Chapman et al., 2004). Technology has been integrated into teaching and learning worldwide (Mahamod and Solah, 2008). Most countries even put technology mastery into their curriculum design. It shows that technology nowadays has been inseparable from education.

As education comprises of various people holding particular positions, the changes also happen to these people. The changes might be different yet still interrelated. Let us see at the two most tangible actors affected; teachers and students. Teachers, as the ones who have role to bring knowledge into classroom, now have also to bring technology into their teaching. This change demands teachers' creativity to combine the technology and knowledge they are about to teach.

Students, as the ones who are full of curiosity and interest in new things, show positive attitude towards technology usage (Mitra and Steffensmeier, 2000; Woodul et al., 2000; Umoren, 2008). It might, in the future, change their needs and orientation. As they will be taking part in the society in the future, or even leading the society in the future, their changing needs have to be the concern of educators. UNESCO (cited in Mahjumdar, n.d.), proposes four stages of approach to develop ICT for teachers, as shown in Table 1.

As technology always changes, the education should also change along with it. Yet, there are somehow obstacles hampering education to catch up technology development. Even though

technology development shows a promising improvement toward quality education, it still has a lot of challenges in turn. Therefore, it is necessary to analyze what technology can give for education, what hampers it, and what we need to do to optimize this potential benefits.

**Table 1. Stages of ICT development**

<i>Approaches</i>	<i>Activities</i>
Emerging	<ul style="list-style-type: none"> <li>• Exploring possibilities and consequences of using ICT for school management.</li> <li>• Adding ICT to the curriculum.</li> </ul>
Applying	<ul style="list-style-type: none"> <li>• Administrators and teachers use ICT for tasks carried out in school management and curriculum.</li> <li>• Schools adapt the curriculum to increase the use of ICT in various subjects.</li> </ul>
Infusing	<ul style="list-style-type: none"> <li>• Integrating ICT across the curriculum.</li> <li>• Teachers' professional lives are now infused with ICT.</li> </ul>
Transforming	<ul style="list-style-type: none"> <li>• ICT blends into teachers' professional practice.</li> <li>• Curriculum focuses on learner-centered.</li> </ul>

## **BENEFITS AND CHALLENGES OF TECHNOLOGY USAGE IN PRACTICE**

### **Technology Integrated Teaching and Learning**

Technology has emerged as one of the most powerful revolution in everyday life. It gives an infinite possibility for every sphere of life to get either good or bad impacts. Likewise, education can be counted as well. In education, technology is used as means for enhancing education practices, as well as teaching and learning activities. It eventually gives a quite obvious changing to education. One of most popular form of technology integrated teaching is what so called e-learning. According to Asmani (2011), e-learning is a learning model which uses ICT (Information and Communication Technology) as the media, especially internet. According to Rosenberg (2001), e-learning has lead education to some tangible changes; it becomes real time, network, and online work.

According to Seels and Richey (1994), there are five elements shaping educational technology practice, such as the subject taught, the characteristics of the learners, the organization where learning happens, the facilities available, and the expertise.

#### ***The Subject Taught***

Teaching is closely related to the subject taught. Thus the use of technology in teaching practice will, indeed, be influenced by the subject the teachers are about to teach. Since technology development not only develops in general way but also in specific, education has its own form of technology that fits to specific subject. In language learning, for instance, there are an enormous number of software developed by experts to enhance linguists and language teachers and learners in learning the language. Thus, these kinds of software could not fit to any other subjects.

#### ***The Characteristics of Learners***

Proper technology for proper subject is not yet enough to enhance learning. Students' characteristics come up as the next concern. How teachers choose the technology used in their teaching, therefore, should also consider the uniqueness of the students in their classroom. It is possible for teachers, as they are expected to have a pedagogical competence to support students' learning (Koehler et al., 2014).

### ***The Organization Where Learning Happens***

As school is the place where learning happens, the technology used should fit the objective set by the school authority. It should be noted that education has its own goal to achieve. Therefore, the use of technology is expected to be able to accelerate the achievement.

### ***The Facilities Available***

Facility is also an important element to be concerned. The absence of facility could hamper the development of ICT integrated teaching and learning. Basically, if the ICT is already available at school, teachers will be able maintain their ability in implementing it into their teaching. Teachers can learn it directly because the facility has already on their hands. However, if such facility is unavailable, teachers would not be able to try it to their teaching. Eventually, teachers would hardly be able to learn it for their professional teaching.

### ***The Expertise***

In addition to four previous elements, teacher's expertise is also vital for educational technology practice. Even though teachers fully understand their students' characteristics, e-learning will not run well without the presence of expertise. In classroom, teachers are the one who will deal with students' interest and motivation in learning. Thus, teachers need to create an effective tool for attracting their learning interests. Being technologically competence will help teachers to enrich their teaching strategies and thus they can integrate it effectively into authentic teaching context (Thompson et al., 1998). As technology expertise will enable teachers to integrate technology into their teaching, its absence will hamper the feasibility of this integration.

### **Benefits**

In an overall view, the technology that could be clearly seen as the main tools in education is computer and internet. Its combination has brought a vast development in teaching and learning process. As stated by Smaldino et al. (2005), in the domain of instruction, there are four main roles of computers: a) As an object of instruction, b) As a tool, c) As an instructional device, and d) As means of teaching logical thinking.

As an object of instruction, computers might be used to learn it as what it is. For instance, students learn how to operate computer or utilizing basic software available in computer. In this case, literally, computer is considered as something to learn.

When talking about computer as a tool, it might imply to computer integration into education, especially in classroom. Computer becomes an important aid for both teachers and students. It is used as the "helper" to optimize the effectiveness of teaching and learning process. Jonassen (cited in Smaldino et al., 2005) suggests technology application availability to support students in each type of problem solving situations (logical problems, algorithmic problems, story problems, rule-using problems, decision-making problems, tactical/strategic performance, case/system analysis problems, and dilemmas).

A number of research found that technology integrated teaching has positive impact towards students achievement (Hadriana, 2014; Mahdum, 2014; Kulik et al., 1986, Mitra and Steffensmeier, 2000; Umoren, 2008). Yet, students' achievement is only one of the benefit products of technology integrated teaching. To see the overall benefits, we should deal with the benefits gained from process where the technology involves. Thus, we should also deal with the challenges hampering the benefits (Asmani, 2011; Smaldino, et al., 2005; Smith, 2004).

Some of the benefits gained from technology integrated teaching are: enhancing students' motivation in learning, promoting cooperative learning, promoting students autonomy, increasing the effectiveness of teaching, and providing diverse experience.

### ***Enhancing Students' Motivation in Learning***

In classroom, students' motivation is critical to enhance their learning. Thus teachers' duties are not only transferring knowledge to their students, but also attracting their students' interest so that they could comprehend the knowledge. Related to educational technology, some experts (Stark et al., 2006; Mitra and Steffensmeier, 2000; Umoren, 2008, Woodul, et al., 2000) reveal that students show positive attitude towards educational technology. They show a good effort in ICT integrated learning. Therefore, the use of ICT in teaching and learning process might be helpful for teachers to gain learners' interest in learning.

### ***Promoting Cooperative Learning***

The flexibility of ICT as learning media can enhance learning into more varied methods. As learning objective is mostly about creating cooperative learners, ICT can also act as suitable media to achieve it. ICT has been proposed as effective media for promoting cooperative learning (Deal, 2009; Neo et al., 2009; Neo, 2005).

### ***Promoting Students Autonomy***

The interesting benefit of ICT is that it is not only helpful for cooperative learning, but also for autonomous learning. With today's technology, students are offered sophisticated tools which can be used to learn autonomously (Prensky, 2008). For some students, ICT somehow can give them space for themselves so that they can gain privacy in learning (Woodul, et al., 2000). Thus, students can learn and explore knowledge by themselves. It eventually opens possibility for them to find, or even, create new things.

### ***Increasing Effectiveness of Teaching***

Teaching effectively is something that most teachers want to achieve. By achieving effective teaching, it means that teachers are already successful in transferring knowledge to their students. In this case, technology can serve as effective media to deliver knowledge. By using technology as teaching and learning media, teachers can do better in explaining (Alston & Miller, 2001). In chemistry, for instance, it will be easier for teacher to explain the process of particular reaction by demonstrate it using multimedia rather than direct explanation. This way, students will be able to visualize it easily. The same goes to other subjects as well.

### ***Providing Diverse Experience***

ICT might provide various learning experiences (Smaldino et al., 2005). Thus, the presence of ICT in education has provides a large number of possibilities for teacher to create their own suitable method for teaching. Moreover, the same goes to students as well because it also provides possibilities for students to find their own comfortable learning style. In other words, with the combination of ICT and teachers' creativity, it can provide an enormous number of ways of creating a savvy education.

### **Challenges**

The benefits, somehow, could not be fully achieved due to some challenges faced in the process, such as: teachers' readiness, facility availability, and students' nature.

### ***Teachers' Readiness***

Teachers' readiness has been one of tangible challenges in integrating technology in teaching and learning activities. The development of technology in education has change the role of

both teachers and students in the classroom. With the presence of technology, teachers have transformed from traditional teachers to facilitator. The students have also changed from passive recipients to active participants (Chapman et al., 2004; Supurwoko, 2010). This demands teachers' readiness to face such changes.

In most studies, it is shown that most teachers believe that technology can surely help them in their teaching, but they are not ready enough in implementing it in their classroom (Alharbi, 2013; Livingstone, 2012; Mahamod and Solah, 2008; Mnzebele, 2013; Singh and Chan, 2014). Therefore, it needs some treatments to maintain readiness of the teachers, such as training related to technology competence, etc.

### ***Facilities Availability***

Facility availability also contributes to the development of technology. Facilities issue has been addressed by experts in some countries as one of issues hampering acceleration of education (Marmolejo, 2007; Odi and Omofonmwan, 2007). Teachers might have knowledge about technology usage. Yet, it is impossible for them to apply their technological competence without the related facilities. In other words, it is impossible to integrate technology into teaching if the technology does not exist. Thus, it should also become a concern before we proceed to integrating technology into education.

### ***Students Nature***

Another challenge hampering technology integrated teaching and learning is the students itself. It is true if we say that technology is very beneficial for education. Yet, saying that it is harming education is not wrong either. If we see thoroughly, the good and bad impact of technology depends on its users. Thus, students, in this point, could hamper the use of technology for educational purposes. As students are still in their learning stage which is full of curiosity, technology comes as tools for obtaining limitless information (Asmani, 2011). This situation might create further issues. For examples, their curiosity might lead them to be more "technology-aware" than are their teachers. It might sound good, but somehow it might cause teachers' inability to control and guide their students' curiosity and creativity.

## **DEALING WITH CHALLENGES**

The revolution of technology integrated teaching and learning is enormously challenging for education to develop. Yet, it should not be the stopper but starter to create a better education which goes hand in hand with the development of global needs. Therefore, there should be an effort to tackle every single factor inhibiting its development.

In an effort to maintain teachers' readiness in integrating technology into their teaching, there should be stimulus to inject awareness, familiarity, and confidence into their professional skill, such as: holding training related to technology integrated teaching, providing technology experts as teachers' counselors, providing sufficient facilities enabling teachers to integrate technology into their teaching, and evaluating the effectiveness of technology usage.

Regarding the students' nature, the way we deal with this issue is not by stopping their curiosity, but letting teachers become equally, or even more technologically competence than their students. By doing so, student will not miss their chance to explore knowledge yet having teachers to control them.

## **CONCLUSION**

Technology is surely helpful for developing education. Yet, in its integration, benefits could not be separated from the challenges. Several studies have shown that technology integrated teaching and learning could improve students' learning motivation and autonomy, effective learning, etc. To gain such benefits, we have to deal with the challenges, such as teachers'

readiness, facilities availability, and students' nature. By putting our effort in tackling the obstacles, it is expected that we could gain the best of what technology can give to education.

## REFERENCES

- [1] Alharbi, A. M. (2013). *Teacher's attitude towards integrating technology: case studies in Saudi Arabia and the United States*. Master Theses, Graduate Research and Creative Practice, Grand Valley States University, United States.
- [2] Alston, A. J., & Miller, W. W. (2001). Analyzing the barriers and benefits toward instructional technology instruction in North Carolina and Virginia in secondary agricultural education curricula. *Journal of Southern Agricultural Education Research*, 51(1), 50-62.
- [3] Asmani, J. M. (2011). *Tips efektif pemanfaatan teknologi dan komunikasi dalam dunia pendidikan*. Jogjakarta: DIVA Press.
- [4] Chapman et al. (2004). *The role of technology in school improvement*. In D. W. Chapman & L. O. Mahlck (Eds.), *Adapting technology for school perspective*. Paris: IIEP Publications.
- [5] Deal, A. (2009). *Collaboration Tools: A teaching with technology white paper*. United States: Carnegie Mellon University.
- [6] Hadriana. (2014). *Keberkesanan penggunaan M-WEBQUEST ke atas pencapaian pemahaman membaca bahasa Inggeris, motivasi pembelajaran sendiri pelajar SMA Pekanbaru*. PhD dissertation, UKM, Malaysia.
- [7] Koehler et al. (2014). The Technological Pedagogical Content Knowledge Framework. In J. M. Spector et al (Eds), *Handbook of Research on Educational Communications and Technology* (pp. 101-111). New York: Springer Science.
- [8] Kulik et al. (1986). The effectiveness of computer-based adult education: A meta-analysis. *Journal of Education Computing Research*, 2(2), 235-252.
- [9] Livingstone, S. (2012). Critical reflections on the benefits of ICT in Education. *Oxford Review of Education*, 38(1), 9-24.
- [10] Mahamod, Z., & Solah, S. M. (2008). Kesediaan guru bahasa Melayu membudayakan TMK dalam pengajaran. In Z. Mahamod & M. A. Embi (Eds.), *Teknologi maklumat dan komunikasi dalam pengajaran dan pembelajaran bahasa Melayu* (pp. 43-72). Shah Alam, Malaysia: Karisma Publications SDN. BHD.
- [11] Mahdum. (2014). *Pembangunan dan penilaian keberkesanan CIRCUM ke atas motivasi, pemikiran kritis, kemahiran sosial, dan pencapaian bahasa Inggeris pelajar SMP Pekanbaru*. PhD dissertation, UKM, Malaysia.
- [12] Mahjumdar, S. (n.d.). *Modelling ICT Development in Education*. Retrieved December 26, 2014, from [www.unevoc.unesco.org/fileadmin/up/modelling\\_ict.pdf](http://www.unevoc.unesco.org/fileadmin/up/modelling_ict.pdf)
- [13] Marmolejo, F. (2007). Higher education facilities: issues and trends. *PEB Exchange*. USA: OECD.
- [14] Mitra, A., & Steffensmeier, T. (2000). Changes in students attitude and students computer use in a computer enriched environment. *Journal of Research on Computing in Education*, 23(2), 90-96.

- [15] Mnzebele, N. (2013). Teachers readiness in using ICT in the classroom: the case of a developing country. *International Journal of Information and Education Technology*, 3(4), 409-412.
- [16] Neo et al. (2009). Engaging students in a multimedia cooperative learning environment: A Malaysian experience. In same places different spaces. *Proceedings ascilite Auckland 2009 (pp. 674-683)*.
- [17] Neo, M. (2005). Engaging students in group-based co-operative learning- a Malaysian perspective. *Educational Technology & Society*, 8(4), 220-232.
- [18] Odia, L. O., & Omofonmwan, S. I. (2007). *Educational system in Nigeria problems and prospects*. *Journal of Social Science*, 14(1), 81-86.
- [19] Prensky, M. (2008). The role of technology in teaching and the classroom. *Educational Technology*, Nov-Dec 2008, 1-3.
- [20] Rosenberg, M. J. (2001). *E-learning strategies for delivering knowledge in the digital age*. New York: McGraw-Hill.
- [21] Seels, B. B., & Richey, R. C. (1994). *Instructional technology: the definition and domains of the field*. Washington, DC: Association for Educational Communication and Technology.
- [22] Singh, T. K. R., & Chan, S. (2014). Teacher readiness on ICT integration in teaching-learning: A Malaysian case study. *International Journal of Asian Social Science*, 4(7), 874-885.
- [23] Smaldino, S. E., Russel, J. D., Heinich, R., & Molenda, M. (2005). *Instructional technology and media for learning* (8<sup>th</sup> ed.). Upper Saddle River, NJ: Pearson Prentice Hall.
- [24] Smith, R. (2004). *Guidelines for authors of learning objects*. Retrieved December 10, 2014, from <http://www.nmc.org/guidelines/NMC%20LO%20Guidelins.pdf>.
- [25] Stark, J., Meier, R., & Rumpel, J. (2006). Students attitudes toward laptop computers: a baseline study. *SBAJ*, 6(1), 50-57.
- [26] Supurwoko. (2010). Pengaruh media pembelajaran berbasis TIK terhadap kemampuan kognitif mahasiswa fisika PMIPA FKIP UNS. *Seminar Nasional Pendidikan Biologi FKIP UNS* (pp. 207-2012).
- [27] Thompson, A., Bull, G., & Willis, J. (1998). SITE position paper: Statement of basic principle and suggested actions. Retrieved November 25, 2014, from <http://site.aace.org/index.cfm/fuseaction/page>. Position Paper.
- [28] Umoren, G. (2008). *Computer self-efficacy, computer anxiety and attitudes towards the internet a study among undergraduates in University of Calabar*. The fourth international conference on technology, knowledge, and society. Boston: Northeastern University. Retrieved December 12, 2014, from [http://t08.cgpublisher.com/proposals/198/index\\_html](http://t08.cgpublisher.com/proposals/198/index_html)
- [29] Woodul, C. E. Vitale, M. R., & Scott, B. J. (2000). Using a cooperative multimedia learning environment to enhance learning and affective self-perceptions of at-risk students in grade 8. *Journal of Educational Technology System*, 28(3), 239-252.