What is and what is not working on the use and teaching of ICT in the classroom

Ernesto Herrera-Franco

LAMAR University

One of the most significant changes in education in recent years has been the almost unlimited availability of a variety of information and communication technologies (ICT) at work, at home, and most significantly, at school. The study of the processes of school integration of ICT is one of the relevant lines in the educational research of the latest years. Changes and innovations in the school culture are always conflicting. These changes suggest the idea of crisis, instability, and uncertainty. Given these situations of innovation and pedagogical change, the institutions and the individuals that make them tend to react in different ways, adopting various strategies that Marcinkiewicz (1993) relates to the innovative tendency of the educator, and ultimately defines or suggest patterns or the use of profiles that may or may not work. This literature review will highlight the ups and downs of some of the ICT elements.

Literature Review

Proper use of devices and access to the Internet

In 2006, Balanskat, Blamire, and Kefala (2006), in a study for European Schoolnet, concluded that teachers use ICT to support existing pedagogies, without representing a substantive alteration of teaching principles and methods. A few years later, the European Schoolnet reanalyzed this fact by comparing results between 2006 and 2013, concluding that in general, the use of ICT has not increased as much as expected since 2006, but seems to have remained stable since then (Wastiau, Blamire, Kearney. Quittre, Van de Gaer, & Monseur, 2013). On the other hand, there is no relationship between the high levels of ICT provision and the trust, use, and attitudes of teachers and students towards them. Curiously, the survey shows that there is no relation between the number of computers in the school and the frequency of their use by students, either at European level or national level (Wastiau, Blamire, Kearney. Quittre, Van de Gaer, & Monseur, 2013).

The OECD report (2016) shows that less than 40% of teachers in the countries studied use ICT as part of their teaching process. School principals point out that the main obstacles to its use are the lack of sufficient computers, limited Internet connection and a shortage of appropriate software. Also, teachers consider ICT training as the second or third priority.

Research conducted by Goeman, Elen, Pynoo, & Braak (2015) states that in general, less than 20% of the schools in primary education reach the European benchmark of one computer for four students. Also, notes that a vast majority of the computers are outdated, especially in primary school and in special secondary education, in which more than half of the computers are more than four years old. Having schools provide devices to every pupil no longer makes sense, at least not in primary schools. According to Tom Redmon, facilitator for LearnZillion, the alternative: sharing devices, a solution that is easier now than it was yesterday. Sharing a Chromebook cart that has plenty of technology for the whole classroom. The sharing is simplified, by adding various pupil profiles on every device. When the student gets on, his or her profile is already loaded. Students have their stuff saved in the cloud, but it is tied to that device as well (Schaffhauser, 2017).

Teacher Readiness

Traditionally, the content of the school curriculum has involved the acquisition of information and knowledge across a spectrum of subject areas, practical and process skills and, possibly to a secondary extent, the improvement of attitudes in line with societal values and beliefs. National certification was typically by written test, where the key purpose was to exhibit secure knowledge and understanding of the relevant, previously taught facts. Facts were relatively permanent entities that could confidently be transferred from generation to generation with little modification (Condie, & Livingston, 2007). Recently, it has been realized that facts are much

more temporary and that views and theories develop and change. This is especially prominent in the sciences, where innovations and inventions overturn previously held views of the facts. The understanding of the world around us and the information that can be accessed about it is growing rapidly, in part supported by an almost unlimited access to the World Wide Web. The constant changes in what we know about the world, along with changing work patterns, means that there is a greater emphasis on developing lifelong learners (Condie, & Livingston, 2007). It is not the mere presence of, or access to, ICT-resources that will transform education. The change will be effected through what educators do with the technology that is available to them. Because technology and the local context are changing it is essential for teachers to involve in an ongoing process of analysis through which they appropriate the affordances of technology to generate creative responses to local needs (Tondeur, Forkosh-Baruch, Prestridge, Albion, & Edirisinghe, 2016). Rather than seeing ICT progress as a threat, educators and education leaders should take account of the several ways technology can improve their work. Computers, expert, and non-expert educators each have similar resources that supplement one another. Computers are excellent for aiming students' elementary content and skill gaps and presenting educators with real-time evaluation data (Arnett, 2016). The teacher is the ultimate key to educational change. Therefore, one element of the successful implementation of online learning is related to teacher readiness. Differences in levels of availability may arise for a range of reasons. It includes a lack of teacher confidence in the technical aspects of using ICT, a level of skepticism about the benefits of ICT use in their subject, reluctance to abandon the role of the expert transmitter of knowledge or a lack of understanding of how to work with ICT to promote learning. The presence of any or all of these perceptions is likely to influence the teachers' readiness to make full use of the ICT potential (Condie, & Livingston, 2007).

The Flipped Classroom

So, what is flipped learning? When multimedia materials and face-to-face instruction are mixed, and the students are provided with online material to study at home for review with the teacher afterward, the classroom and the teaching and learning process are described as flipped (Baggaley, 2015). Many people get confused because blended learning also do that. Flipped and Blended learning indeed appears to be one and the same, in distance education specifically, but Blended Learning also combines traditional instruction training with multiple forms of self-directed training to create flexible learning formats, both in a brick-and-mortar facility setting and online. Since this first definition, blended learning advocates have developed a wide range of practices including many that have been standard in education for over hundred years (Baggaley, 2015). Even as institutions such as the Flipped Learning Global Initiative support the idea of educators assigning education or video through online platforms that learners do at home

and then allowing the students to practice their skills when the instructor can work with them back in the classroom, the novelty of flipped is chilling down. According to Kelly Mendoza, who runs the professional development program for Common Sense Education, one cannot entirely reconstruct everything that one is doing. One can flip a lesson here or there and have excellent outcomes around that, but it does not seem like a hot topic regarding demand (Schaffhauser, 2017). Sean Nank, a member of the faculty at both California State University San Marcos and American College of Education, suggest his students be very careful in the details of the way they do it because the research is showing conflicting results. Some research indicates that it works great; other research is proving it causes no difference, and still, other research is confirming that it is harmful. So, it matters how one flips the classroom. On top of that is the digital equity challenge. What to do when some of the students do not have access to

technology at home (Schaffhauser, 2017). The good news regarding this mater, at least in Europe, is that than 98% of the pupils, both from primary and secondary education, have access to a device with Internet access at home and increasingly more pupils also have their computer with Internet access (Vanderlinde, Dexter, & van Braak, 2012).

Cost-Benefit

The usage of tablet computers in school is no longer hot or exciting, which puts them on the cooling end of ed-tech right now. But that does not imply that computing devices themselves are no longer of importance in education. In fact, it is just the contrary. Digital Promise's Cator states that devices come and go. The next cool thing will be out next week. But the facts remain that each learner needs an access spot at their fingertips all the time. They need to be able to do all the things students do with computers. Whether it is a laptop or a tablet or another device, every student needs that access point that they can put in their backpacks, take home, use to access their homework, communicate with their peers and experts and get their work done (Schaffhauser, 2017). When people think in a tablet, they usually think iPads. Also, they think $600 per. iPads are great. But if you do not especially require everything that an iPad provides, you can spend a third the cost and get access to online resources. Cost is the main cause why Chromebooks are on the rise and iPads are declining (Schaffhauser, 2017). An example of good leadership is Cary Matsuoka, Superintendent of California's Milpitas Unified School District; she gave principals and teachers the autonomy to determine what would work best for their schools rather than mandate change from the top. Matsuoka discerned having one device per pupil wasn't necessary. Rather, the principals suggested a rotation model, in which learners would take turns on the devices. Milpitas started with 2,000 Chromebooks because they are less

expensive than iPads and are cloud-based so that they can be centrally controlled and updated (Lapowsky, 2015).

Blended Learning

Blended learning is also known as hybrid learning. It has been referred to as the third generation of distance education. There are many definitions of blended learning with varieties in different themes. Blended learning is an instructional method that combines several (a) instructional modalities, (b) instructional methods, (c) instructional technologies, and (d) delivery methods to meet specific communication, knowledge sharing, and information needs (Kuo, Belland, Schroder, & Walker, 2014). According to Horn and Staker (2015), "Blended learning is any formal education program in which a student learns at least in part through online learning, with some element of student control over time, place, path, and/or pace" (p. 34). Blended learning integrates the strengths and advantages of face-to-face learning and computer-mediated learning, and reduces the limitations of merely applying face-to-face or computer-mediated instruction such as prevalent procrastination, and lack of spontaneity and interaction. Blended learning improves face-to-face learning with the use of online technologies without replacing routine classroom contact hours (Kuo, Belland, Schroder, & Walker, 2014). Depending on how it is defined blended, it may be going as strong as ever. But regarding the number of people using and talking about that term, it is getting cooler. A similar challenge is covering for other concepts, such as personalized learning and project-based learning. As one experiences the accelerated growth and innovation in digital tools for learning, it is hard to find ways to explain what they are and what they do. When dealing with new technologies, which often bring to new models of pedagogies. Trying to determine the terms for tech-infused instruction such generic terms, anybody can say anything about what they are doing with it. For that reason, there need to be

standards or essential elements to describe what blended means or personalized means, because now it means basically everything. Without the proper comprehension of the concepts and without the knowledge of how to use technology to do blended or personalized learning, promotion of concepts such as blended can become an overwhelming burden.

ICT Policy Plans

In the realm of ICT policy planning, Vanderlinde, Dexter, & van Braak (2012) conducted an exploratory study; they aim to use ICT leadership practices to examine the content of school-based ICT policy plans in primary education. Although all schools were selected by their score on a specific measurement scale evaluating their ICT vision and policy, they found that of the 31 schools, six did not have an ICT policy plan, and 25 schools did. Not surprisingly, the six schools without an ICT policy program were also the schools with the lowest score on the selection variable. To implement a robust policy plan, the authors recommended applying three categories of ICT leadership practices (setting direction, making the organization work, and developing people). Also, they identified three types of ICT policy plans: (1) an ICT policy plan as a vision blueprint, (2) an ICT policy plan as a technical inventory and (3) a comprehensive ICT policy plan. The last type considers all three categories of ICT leadership practices. It has been defined as a policy plan grounded in a vision of education and ICT integration with indications for how the school organization should provide supportive circumstances for teachers' classroom practices and students' learning activities (Vanderlinde, Dexter, & van Braak, 2012). An ICT policy plan is present in about three out of four Flemish schools. According to the school board, the bulk of the schools at all levels are preparing adjustments about the use of social media and are focusing on online privacy and how pupils can manage ICT safely. A minority of the schools attempts a specific stimulation plan on free software.

Nevertheless, a high proportion of the teachers is not aware of one or more subjects in the school policy plans. In general, principals and educators have a quite positive approach towards the quality of the ICT policy. Male educators in elementary education rate the quality of the policy and support more highly than female teachers. They also believe that they are involved more in the acquisition of new peripherals or software. Younger educators from pre-school, primary and secondary education feel more involved in the buying policy (Goeman, Elen, Pynoo, & Braak, 2015)

Conclusion

There is still a long way to go before ICTs are fully integrated into schools and teaching. In order to overcome the cons of most of most of the topics covered by this literature review, it must first start with a conscious and well-designed ICT policy plan. Followed by an extensive program of teachers' capacitation. The acquisition of devices must be well-planned, and to be careful not to buy expensive devices that will not fulfill the teaching and learning expectations. The flipped model should be used in moderation, and be careful not to overwhelm students with too much homework. A well-balanced Blended Learning model will produce excellent outcomes. Since this literature review covered a broad array of concepts, further research is recommended.

References

Arnett, T. (2016). In the machine age: How innovation can make bad teachers good and good teachers better [PDF File]. Retrieved from https://www.christenseninstitute.org/wp-content/uploads/2017/03/Teaching-in-the-machine-age.pdf

Baggaley, J. (2015). Flips and flops. *Distance Education*, *36*(3), 437-447. doi:10.1080/01587919.2015.1041677

Balanskat, A., Blamire, R., & Kefala, S. (2006). The ICT Impact Report. A review of studies of ICT impact on schools in Europe. *European Schoolnet*. *European Comission* [PDF File]. Retrieved from https://www.google.com/search?q=The+ICT+Impact+Report.+A+Review+of+Studies+of+ICT+Impact+on+Schools+in+Europe.+European+Schoolnet.&oq=The+ICT+Impact+Report.+A+Review+of+Studies+of+ICT+Impact+on+Schools+in+Europe.+European+Schoolnet.&aqs=chrome..69i57.943j0j8&sourceid=chrome&ie=UTF-8

Condie, R., & Livingston, K. (2007). Blending online learning with traditional approaches: Changing practices. *British Journal Of Educational Technology*, 38(2), 337-348. doi:10.1111/j.1467-8535.2006.00630.x

Goeman, K., Elen, J., Pynoo, B., & Braak, J. (2015). Time for action! ICT Integration in Formal Education: Key Findings from a Region-wide Follow-up Monitor. *Techtrends: Linking Research & Practice To Improve Learning*, *59*(5), 40-50. doi:10.1007/s11528-015-0890-6

Horn, M. B., & Staker, H. (2015). Blended: Using disruptive innovation to improve schools. San Francisco, CA. Jossey-Bass.

Kuo, Y., Belland, B. R., Schroder, K. E., & Walker, A. E. (2014). K-12 teachers' perceptions of and their satisfaction with interaction type in blended learning environments. *Distance Education*, *35*(3), 360-381. doi:10.1080/01587919.2015.955265

Lapowsky, I. (2015, May 08). What schools must learn from LA's iPad debacle [PDF file]. Retrieved from https://www.wired.com/2015/05/los-angeles-edtech/

Marcinkiewicz, H. R. (1993). Computers and teachers: Factors influencing computer use in the classroom. *Journal Of Research On Computing In Education*, *26*(2), 220.

OECD (2016), *Innovating Education and Educating for Innovation: The Power of Digital Technologies and Skills*. OECD Publishing, Paris. [PDF File]. http://dx.doi.org/10.1787/9789264265097-en

Schaffhauser, D. (2017). 5 Ed Tech Trends on the Way Out in 2017. *T H E Journal*, *44*(2), 14-17.

Tondeur, J., Forkosh-Baruch, A., Prestridge, S., Albion, P., & Edirisinghe, S. (2016). Responding to Challenges in Teacher Professional Development for ICT Integration in Education. *Journal Of Educational Technology & Society*, *19*(3), 110-120.

Vanderlinde, R., Dexter, S., & van Braak, J. (2012). School-based ICT policy plans in primary education: Elements, typologies and underlying processes. *British Journal Of Educational Technology*, 43(3), 505-519. doi:10.1111/j.1467-8535.2011.01191.x

Wastiau, P., Blamire, R., Kearney, C. Quittre, V., Van de Gaer, E. & Monseur, C. (2013). The use of ICT in education: A survey of schools in Europe. *European Journal of Education,* Part I [PDF File]. Retrieved from https://orbi.ulg.ac.be/bitstream/2268/167401/1/article%20de%20EJE.pdf