Identify Barriers in The Use of Educational Technology by Teachers of Schools and University

Puja Pant Naithani[1] and Sita Devi[2]

Abstract

This article discusses the challenges that professors at an Indian institution have while trying to adopt new methods of evaluating students' work that use information and communication technology (ICT). Challenges and adjustments in the teaching staff's role that are either accepted or rejected arise in the decision-making process and assessment in a competency-based approach. The same thing occurs when we combine the use of ICT in education with other innovative processes. However, only a minority of educational institutions have the resources necessary to implement multimedia instruction. Multimedia is a powerful tool for educators since it allows pupils to study and comprehend more thoroughly. Learning about the specific challenges teachers face, while using multimedia in scientific classrooms might help them succeed in their careers. In this article, we refine and review the challenges associated with using multimedia in scientific classes. The results show that many educators want to use multimedia in their lessons but are hindered by various factors. Fear, inexperience, and a lack of opportunities were the primary hindrances. Hence, it is crucial to equip the instructors with high-quality professional development opportunities, as well as appropriate time opportunities and technical assistance, to improve classroom instruction and student outcomes. Good education relies on several interrelated factors; none of them can stand alone. Yet having everything in place improves the odds of successful multimedia integration into educational settings. Those in charge of implementing multimedia in science classrooms will find useful information and suggestions in this article.

Keywords: *Learning, Teaching, Multimedia, Technologies, Competency, Barriers*

INTRODUCTION

Educators must get ongoing professional development resources so that they hone their own knowledge skills and give students a range of learning environments that are grounded in the subject areas covered in class (OECD, 2005). Implementing training systems based on competences is one way to guarantee that students get an education that applies to their future careers (Tejada Fernández, 2012; Valle & Manso, 2013). A paradigm shift in how assessment is approached and the role of the teaching staff as evaluators is required for effective implementation of such training (Cano & Ion, 2012; Tejada Fernández & Ruiz Bueno, 2016). As a result, both managing study plans and organizing and working with teaching teams provide challenges related to analyzing formative coherence and the identification of learning tasks or evidence that may account for the training and development of skills (Cano, 2015a; Romero & Halal, 2013). Yet, need to incorporate new technology into the training processes of higher education has emerged in response to shifts in society and communication (Garca-Varcárcel, 2011). The assessment phase of the teaching-learning process has been modernized to include the use of technology (Cano, 2015a; Cano & Ion, 2012). Sancho-Gil, Alonso Cano, & Sánchez-Valero, 2018; Fainholc, Nervi, Romero, & Halal, 2015) note that schools and training facilities must adjust their methods to accommodate these new programs. This article presents the results of a research on professors' impressions of the obstacles they face while trying to innovate their assessment methods via the use of ICT at a university.

From the safety of our classrooms, we may watch while the world around us becomes more specialized. Because of this final factor, the transmission-based educational paradigm has been pushed to the background in recent training procedures (Hargreaves, 2003). Institutions of higher education look for ways to include these quintessential aspects that enrich professional training in light of unforeseen developments (Cano & Ion, 2012). The onus is on educators and pedagogical approaches to provide learning circumstances that

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[1] Research Scholar, Maharishi University of Information Technology, Lucknow (UP) India E-mail: pujanats11@gmail.com

[2] Maharishi University of Information Technology, Lucknow (UP) India

mimic the actual world of work. The OECD advocated the competency-based training approach at the European Higher Education Area conference in Bologna, in 1999 as a way to address this requirement in higher education. Chile is not alone in South America in developing plans to restructure the higher education system (Beneitone et al., 2007). To be effective in complicated settings, students need to have not just intellectual practice, but also the skills and attitudes that this method fosters (Le Boterf, 2011; Perrenaud, 2004). All aspects of their lives and careers, including the quality of their work, depend on the ongoing cultivation of these skills (Cano, 2015a).

Competency-based training is becoming more popular, but this shift has brought up some interesting problems with incorporating technology into the training process. Again, this integration necessitates new responsibilities for instructors and students, to which they either readily adjust or actively push back. Both are positive aspects of the pedagogically-planned integration at hand (Garca-Vázquez, 2011). Despite the prevalence of information and communication technologies (ICT) in higher education, there is always an insufficiency of actual integration in the learning and teaching process owing, in part, to inadequate teacher preparation (Camacho, 2014). Virtual classrooms, often known as Learning Management System (LMS) platforms, are one kind of technology used to supplement in-person instruction. The provided tools streamline several processes, including assessment, by facilitating the creation of online exams and evaluation criteria in the rubric module, which in turn facilitates the use of a wide range of instructional and grading approaches. The majority of the time, people just use the online world to save information (Pérez Berenguer & Garca-Molina, 2016). The modality of integrating this technology has been conceptualized at a fundamental level, both in terms of its usage for assessment and in addition to non-physical face-to-face instruction (through the web and the 'web-supplemented' classroom) (OECD, 2005). These sites have been used as a method for enhancing both classroom practice and the opportunity for teacher reflection to varied degrees (Fainholc et al., 2015).

LITERATURE REVIEW

Abdulkareem Eid S. Alwani (2010) This research looked at how difficult it is to include ICT in the scientific curriculum in the Yanbu school district in Saudi Arabia. Infrastructure and resources, policy and support, scientific educators' personal values, and professional development were all explored. In this chapter, we use survey data to identify some of the most frequent challenges faced by scientific educators. Science educators' similarities and differences in gender, school location, education, teaching experience, and age were all captured by the collected data. On a scale from 0 (does not restrict) to 3 (significantly limits), science instructors ranked the obstacles preventing them from using technology in the classroom (greatly limits). The more obstacles science instructors have to overcome, the less likely they are to employ technology in the classroom. Improving the degree of IT integration in Saudi Arabian scientific education requires a well-thought-out strategic goal, sufficient resources, and a competent execution strategy to reduce the negative effects of these obstacles.

BENMANSOUR Souheyla (2019) From the dawn of the digital era, ICT has played a pivotal part in enhancing classroom instruction. As a result, many nations want to improve education by increasing its efficiency and quality and see ICT as a means to that end. This position in education helps both students and instructors succeed in their pursuit of education. Rapid progress in a short time frame has made ICT a topic of intense attention in educational institutions. Rapid progress in ICT has also prompted significant shifts in the classroom. As a result, it's crucial that we prepare today's educators and tomorrow's leaders for the challenges posed by the information society. Improvements in education quality are possible via the use of ICT and the new opportunities it may provide educators to create. Given these contexts, educators in the 21st century must take the initiative to integrate technology advances into the classroom. Key aspects in the process of implementing new ICT include, at present, needed capabilities and the degree of desire. The primary goal of this research is to collect first-hand accounts of how educators and students are using ICT today so that strategies and action plans may be developed to better integrate these tools into Algeria's higher education system. The study's overarching goal is to learn what factors, if any, instructors see as preventing

them from using ICTs in their classrooms. The results, together with their pedagogical implications for the use of ICT in an English as a Foreign Language setting, will be explored in light of relevant learning theories.

Juliet Joseph (2012) The effects of educational technology on the relationship between teachers and their students, as well as whether or not students are really learning because of this technology, will be the focus of this study. Although the research finds that technology may improve interactions between teachers and students, it also finds that technology cannot replace the human and social factors essential to teaching and learning. There is no substitute for human connection in the classroom, and there may be less of it if technology is used more extensively. Language accounts for 80% of all communication, with the remaining 20% coming via nonverbal means like writing. Twenty percent of educators say they've come to the conclusion that technology isn't the most effective tool for the classroom.

Cristina Mercader (2020) One of the most popular tools students utilize to create a unique learning space is digital technology. Recent studies, however, continue to show that faculty members, particularly those in higher education, do not make use of opportunities to improve their teaching methods. This research aims to determine whether or not academic discipline has a role in the view that professors at higher education institutions do not utilize digital technology for teaching purposes by identifying personal, professional, institutional, and environmental impediments. According to the findings, the field of arts and humanities seems to be the one where the greatest professional impediments are encountered. In conclusion, more institutional participation via strategic planning and improved professional development for educators are both necessary.

Chandan Singhavi and Prema Basargekar (2019) In a developing nation like India, where the digital gap exists between people of various socio-economic backgrounds, the integration of information and communication technology (ICT) in schools is seen as a vital instrument for making education student-focused. There has been a lackluster reaction from schools to the government's initiatives to have them embrace ICT and include it into the curriculum. Teachers play a pivotal part in ensuring the successful integration of ICT into the school curriculum. The degree to which they embrace the use of ICT in the classroom is crucial to the program's ultimate success. According to the available literature, a significant barrier to the widespread adoption of ICT at the K-12 level is teachers' reluctance to utilize such tools in the classroom. There are currently only a few number of studies that attempt to catalog these obstacles as they are seen by educators. This research employs a ranking system to assess, from the viewpoints of English and Regional medium school instructors, the obstacles to the use of ICT. Using logistic regression analysis, the research investigates whether and to what extent the removal of certain obstacles would increase the propensity for both kinds of schools to make use of ICT.

BARRIERS TO IMPLEMENTING MULTIMEDIA IN TEACHING

Institutional Barriers: According to Albidewi & Tulb (2014), a major expenditure by the institution in training personnel and monitoring of learners is necessary to guarantee that the technologies are utilized successfully to achieve successful user acceptance. The Computer Center at a private deemed university in Thailand provided training workshops for all faculty members when Moodle was first introduced at the institution, demonstrating the importance of training with regard to the usage of education technology. From what I've read, "people may readily utilize the technology in their everyday lives after receiving training" (Wichadee, 2015). This means that if teachers and students have been given the proper training, multimedia technology shouldn't pose too much of a challenge. Institutions may also dispute the value of multimedia technology due to the expenditures they incur (Guri-Rosenblit, 2005). Costs associated with the use of technology in education systems in developing nations are multifaceted, with substantial components including concerns like student access to computers, internet services, software, and IT assistance on and off campus (Alfahad, 2012). In addition, most of the institutions in underdeveloped nations that have adopted educational technology face pervasive infrastructural and technological hurdles (Al-Harbi, 2011). Protecting the necessary rules, processes, and software/hardware capacity is a significant difficulty. Support for and training in the use of multimedia technologies is sometimes absent in less developed nations. However, there are still pockets of the world where higher education institutions lack the Internet access necessary to fully

embrace multimedia technology. The lack of robust information technology (IT) security at universities in poor nations is another factor preventing students from using multimedia technologies outside of campus.

Teacher Barriers: According to Mapuva and Muyengwa (2009), educators are the "policy implementation members" of the institution, regardless of location, through means of effective academic communication with students. This claim is supported by studies showing that teachers play a vital role in society by disseminating information quickly and effectively (Copeland, 2001). The degree to which professors embrace technological innovations in the classroom depends on a number of factors, including their familiarity with and comfort with using technological tools in the classroom, as well as their views and pedagogical approaches (Al-Harbi, 2011). Perception, attitude, the influence of those around them, and accessibility all play a role in the academic staff's acceptance of multimedia technology. Confidence in the use of multimedia technology is very vital for students, and the support of university personnel is crucial in this regard (Kimwise, 2018; Al-Harbi, 2011).

"The usage of new technology (multimedia technologies) by instructors is explained largely in connection to their discernments regarding the value they get from new technologies," as proposed by Alenezi (2012). Hence, faculty members who see the value in utilizing multimedia technologies quickly have more chances to be the pioneers in incorporating them into their classrooms. Yet, when teachers only anticipate small benefits from the new technologies, they are more likely to continue to using just the characteristics with which they are already comfortable (Alshammari, 2015; Buabeng, 2012). Even though LMSs have numerous functions and capabilities, only one or two limited functions are utilized by academics, as one participant in research to identify faculty members' usage of the Learning Management System (LMS) at institutions in South Arabia put it (Alshammari, 2015). Because of this, it's clear that some aspects of current multimedia technologies need to be adjusted or else users (teachers/lecturers) would see them as inadequate for their purposes.

Technological Barriers: Problems with the system itself, internet connectivity, and networks all serve as roadblocks to the widespread adoption of multimedia technologies (Shihundu, 2014). The candidates argue that the absence of available and accessible technology renders it cumbersome to employ technology in teaching and learning in the setting of higher education institutions in Africa (Becker, Newton, & Sawang, 2013). Lack of, or problems with, the necessary technical infrastructure is another major barrier to the widespread adoption of technologies like multimedia (Venter et al., 2012). This is especially true for nations with weak technology infrastructure, such as those still in development. Inadequate e-learning and ICT infrastructure was identified as a major barrier to the widespread adoption of e-learning at public institutions in a research conducted by Tarus, Gichoya, and Muumbo (2015). So, it is suggested, developing nations need to spend extensively in technology and infrastructure if their educational institutions are to establish world-class universities and increase the quality of education.

RESEARCH METHODOLOGY

The first part of the research was a quantitative examination of the characteristics and effects of technology-based education. A strong and sustained rationale is needed to ensure that technology improves students' educational experiences in a meaningful way; nevertheless, there has not been enough large-scale actual study done on the matter. The second step in improving the efficacy of this strategy has been the identification of impediments to technology integration from both the perspective of teachers and students. It was a purely desk-based investigation. This research set out to determine whether and to what extent educational institutions that use technology-based learning have achieved their pedagogical aims. Desk research included the use of both primary and secondary materials, including those found in libraries and online.

DATA ANALYSIS

The survey asks educators about their views on 25 obstacles to using Technology in the classroom. A weighted score was calculated and applied to each teacher's answer to see how they all stacked up. Based on the teachers' rankings, the Rank Order technique provides more weight to the most highly rated barrier and less weight to the least highly rated obstacles. You may see how instructors in English-medium schools and regional-medium schools ranked these perceived hurdles from greatest to lowest in Tables 1 and 2 below.

Table 1: Rank order Analysis of Barriers perceived by the teachers in using ICT in the classroom: schools with English medium

Sr. No.	Barriers	Mean Score
1	Insufficient internet bandwidth or speed	2.39
2	Insufficient number of internet-connected computers	2.36
3	Lack of flexibility due to time constraint and overload of work	2.36
4	Insufficient number of the interactive whiteboard or any other educational software	2.33
5	Lack of pedagogical models on how to use ICT for learning	2.29
6	Inadequate space and infrastructural facilities	2.25
7	Lack of contents in regional languages	2.24
8	Inadequate training is given to the teachers for using ICT in the classroom	2.24
9	Restrictive timetable	2.24
10	The pressure to prepare students for exams and tests	2.23
11	Lack of contents in national (Hindi) language	2.16
12	Insufficient number of computers	2.14
13	School computers out of date or need repair	2.12
14	Insufficient pedagogical support for teachers	2.09
15	Lack of adequate contents or material for teaching	2.08
16	Lack of knowledge of how to use ICT effectively in teaching and learning	2.08
17	Lack of confidence regarding the use of ICT	2.07
18	Using ICT in teaching and learning not being a goal of the school	2.04
19	Too difficult to integrate ICT use into the curriculum	2.01
20	Insufficient technical support for teachers	2.01
21	Lack of interest of teachers	1.99
22	Most teachers not in favor of the use of ICT at school	1.94
23	Most parents not in favor of the use of ICT at school	1.94
24	Lack of adequate skills of teachers	1.92
25	No or unclear benefits of using ICT for teaching	1.87

Table 2: Rank order Analysis of Barriers perceived by the teachers in using ICT in the classroom: schools with regional language

Sr. No.	Barriers	Mean Score
1	Lack of flexibility due to time constraint and overload of work	3.12
2	Insufficient number of internet-connected computers	3.01
3	Lack of contents in national (Hindi) language	2.80
4	Insufficient number of the interactive whiteboard or any other educational software	2.77
5	The pressure to prepare students for exams and tests	2.73
6	School computers out of date or need repair	2.63
7	Insufficient pedagogical support for teachers	2.61
8	Insufficient internet bandwidth or speed	2.54
9	Lack of contents in regional languages	2.51
10	Inadequate training is given to the teachers for using ICT in the classroom	2.48
11	Restrictive time table	2.45
12	Lack of adequate contents or material for teaching	2.41
13	Lack of pedagogical models on how to use ICT for learning	2.41
14	Inadequate space and infrastructural facilities	2.41
15	No or unclear benefit of using ICT for teaching	2.31
16	Insufficient number of computers	2.17
17	Most parents not in favor of the use of ICT at school	2.15
18	Lack of knowledge of how to use ICT effectively in teaching and learning	2.07
19	Lack of adequate skills of teachers	1.98
20	Most teachers not in favor of the use of ICT at school	1.95
21	Lack of interest of teachers	1.94
22	Insufficient technical support for teachers	1.75
23	Lack of confidence regarding the use of ICT	1.73
24	Too difficult to integrate ICT use into the curriculum	1.54
25	Using ICT in teaching and learning not being a goal of the school	1.54

Three of the first five hurdles are shared by both institutions. These have to do with the physical resources available in the classroom, as well as the inflexibility and lack of time to use ICT effectively. The third main hurdle in regional medium schools is a lack of material in the regional language, which is not highlighted by instructors in English medium schools. The two groups of educators agree that a lack of enthusiasm on the part of educators or parents, or a lack of abilities, is the least significant impediment. The results indicate that the difficulties associated with extrinsic variables have been ranked higher by instructors than intrinsic ones. It turns out that the biggest roadblocks are limited bandwidth and a lack of accessible PCs with Internet access.

The goal of the research was to determine whether or not removing obstacles faced by educators working in regional language schools or English medium schools would increase their comfort level with using Technology in the classroom. As 'willingness to utilize ICT in the classroom' is a binary dependent variable, Logistic Regression is used to ascertain whether or not significant hurdles to teachers' adoption of ICT in the classroom can be reduced. Language of delivery was used in two logistic regressions. Logistic regression's categorization table is shown in Table 3. Acceptance of ICT may be predicted using this model with a 65.0% accuracy.

Table 3: Classification table – Schools with English Medium

Observed			Predicted		
			Willingness to use ICT in the classroom		Percentage Correct
			Yes	No	
Step 1	Willingness to use ICT in the classroom	YES	200	33	85.8
		No	96	40	29.4
	Overall Percentage				65.0

According to the data in the table, 85.8% of the students were accurately labeled as being ready to use ICT in the classroom. As many as 29.4 percent of students say they don't want to learn with the help of technology. The overall accuracy rate was 65.0%. The Model presupposes that instructors are fully committed to implementing ICT into their lesson plans regardless of any potential obstacles. Teachers' openness to using ICT in the classroom may be significantly influenced by several factors.

H0 (1): There will be a statistically insignificant change in improving willingness to use ICT in the classroom where the language of delivery is English even after the barriers are reduced.

The significance of the gap between English- and Regional-medium schools was examined using a Chi-Square test. The data is tabulated in Table 4.

Table 4: Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	9.977[a]	1	.002		
Continuity Correction	9.359	1	.002		
Likelihood Ratio	9.883	1	.002		
Fisher's Exact Test				.002	.001
Linear-by-Linear Association	9.958	1	.002		
N of Valid Cases	515				

The difference in schools' propensity to embrace ICT shows statistical significance, as seen in Table 4. The survey asks educators about their views on 25 obstacles to using Technology in the classroom. A weighted score was calculated and applied to each teacher's answer to see how they all stacked up. Based on the teachers' rankings, the Rank Order technique provides more weight to the most highly rated barrier and less weight to the least highly rated obstacles. You may see how instructors in English-medium schools and regional-medium schools ranked these perceived hurdles from greatest to lowest in Tables 1 and 2 below.

CONCLUSION

There was a large gap in what teachers at different universities believed technology could achieve for their students' education. Teachers' views on the value of using technology in the classroom may be influenced by their confidence in their own talents, their willingness to adapt to new situations, and their faith in the continued success of information and communication technologies (ICTs) in language instruction. It was also found that instructors were primarily responsible for adapting their usage of technology in the classroom in light of the benefits and drawbacks they saw in their own particular settings. Participants in the survey felt that EFL teachers and students may both benefit from the use of technology in these areas. There is widespread agreement that using technology in language classrooms may improve instruction and encourage more student participation. Although participants recognized the benefits of information and communication technologies (ICT), they also voiced concerns about a number of obstacles to its use. Students' academic performance significantly rises when schools use technological teaching methods. Stone- Wisker (Schacter, 1999) argues that technology is useless unless education is given more priority. When combined with more traditional forms of teaching, the aforementioned technologies have the potential to radically transform the future of education. This is because they are here to stay for the foreseeable future and have made substantial contributions to specialized sectors.

REFERENCES

Abdulkareem Eid S. Alwani, Barriers to Effective use of Information Technology in Science Education at Yanbu Kingdom of Saudi Arabia, E-learning, experiences and future, 2010

Nayef Alkawaldeh, Barriers to Utilizing ICT for Educational Purposes in Jordan, 2019

Benmansour Souheyla, Major Barriers and Challenges to Integrating ICT in Education, Cross Current Int J Peer Reviewed J Human Soc Sci, Nov, 2019; 5(11): 342-348

Joseph, Juliet. (2012). The Barriers of Using Education Technology for Optimizing the Educational Experience of Learners. Procedia - Social and Behavioral Sciences. 64. 427–436. 10.1016/j.sbspro.2012.11.051.

Mercader, Cristina & Sallán, Joaquín. (2020). University teachers' perception of barriers to the use of digital technologies: the importance of the academic discipline. International Journal of Educational Technology in Higher Education. 17. 4. 10.1186/s41239-020-0182-x.

Johnson, A. M., Jacovina, M. E., Russell, D. E., & Soto, C. M. (2016). Challenges and solutions when using technologies in the classroom. In S. A. Crossley & D. S. McNamara (Eds.) Adaptive educational technologies for literacy instruction (pp. 13-29). New York: Taylor & Francis. Published with acknowledgment of federal support.

Cristina Mercader, University teachers' perception of barriers to the use of digital technologies: the importance of the academic discipline, International Journal of Educational Technology in Higher Education (2020) 17:4

Juliet Joseph, The Barriers of Using Education Technology for Optimizing the Educational Experience of Learners, Procedia - Social and Behavioral Sciences 64 (2012) 427 – 436

Abbitt, J. T. (2011). An investigation of the relationship between self-efficacy beliefs about technology integration and technological pedagogical content knowledge (TPACK) among preservice teachers. Journal of Digital Learning in Teacher Education, 27(4), 134-143.

Albidewi, I., & Tulb, R. (2014). Promise and challenge of e-learning – literature review. European Scientific Journal, 10(1), 210-217

Alshammari, M. S. A. (2015). Academics' adoption and usage of learning management systems in Saudi Arabia's universities (PhD thesis, De Montfort University, Leicester, England). Retrieved from https://www.dora.dmu.ac.uk/handle/2086/11 123.

Mtebe,S, J, Mbwilo,B and Kissaka,M,M. (2016). Factors Influencing Teachers' Use of Multimedia Enhanced Content in Secondary Schools in Tanzania. International Review of Research in Open and Distributed Learning Volume 17, Number 2.

Navani, Y and Ansari, M. A. (2016). "A study of e-learning readiness of university faculty "International Journal of Current Research. 8(08), 35752-35756. Prabu, P. S. (2015). Awareness about e learning among arts and science college students. International Journal for Innovation Education and Research, 3(7), 110-114.

Shihundu, l. N. (2014). Factors Influencing ICT Adoption among Public Secondary School Teachers. A case of Webuye subcounty, Bungoma County, Kenya. A research report for Master of Arts degree in project planning and management, University of Nairobi.

Wichadee, S. (2015). Factors related to faculty members' attitude and adoption of a learning management system. The Turkish Online Journal of Educational Technology - TOJET, 14(4), 53-61.