IN-SERVICE TEACHERS' RESISTANCE TO TECHNOLOGY:
A QUALITATIVE META-SYNTHESIS BY ENTREQ STATEMENT (1998-2018)

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ABSTRACT

While the discussions that technology will take over humanity and artificial intelligence will control our lives in the future, it is obvious that the technology is with us in all areas of our lives today. It is seen that today's students in the generation Z are integrated with technology. Therefore, it is an important professional feature that teachers are expected to use technology effectively in the educational process. The aim of this research is to interpret and discuss the findings of qualitative researches that have put forward teachers' opinions, resistances and suggestions about technology through a new qualitative sytematic research method in education called "meta-synthesis". As a result of this meta-synthesis research (n=10); insufficient time, lack of access to computers-software, inadequate technical and administrative support, teacher beliefs and attitudes, difficulty of adapting technology to instructional design were reached as the cause of resistance of the teachers. Availability of computers, organization of equipments for the access of everyone, providing tech-expert teachers, collaborative and risk taking leadership, school leaders supporting innovation, a cohesive framework for facilitating professional development by school districts, empowerment of the teacher beliefs by the policymakers and school leaders were reached as the key concepts to eliminate the resistance.

Keywords: In-service teachers, resistance behaviours, technology, meta-synthesis.

INTRODUCTION

There is always a time lag between the invention of a new technology and its dissemination and general acceptance (Weintrobe, 1970) therefore there will be a time lag between the emergence of technological developments and its integration in education as well as in all other fields. This process in education may arise from different reasons such as the incompatibility of technological infrastructure in the schools (Lu, Tsai and Wu, 2015; Makki, O'Neal, Cotten and Rikard, 2018), attitudes of the administrators or district officials (Andreasen, Medina and Newell, 2018; Yu & Prince, 2016), insufficient technological support for the school personnel (Huang, Teo & Zhou, 2019; Rabah, 2015), lack of time in preparing technology-supported lessons (Lawrence & Tar, 2018) and more importantly teacher-related problems such as their beliefs and attitudes towards technology use in the class (Li, 2018; Vongkulluksn, 2018).

Teachers are one of the most important practitioners of technology in education. In most cases, the teacher is key to effective implementation of the use of computers in the educational system (Teo, 2008) and teachers are the key to the success of computers in the classroom and no matter what changes are implemented, without the support and motivation of teachers, technology integration will not succeed (Himsworth, 2007). In other words, the effectiveness and prevalence of technology use in schools is generally mainly related to how a teacher uses technology in his class and how much he wants to use it in parallel. In fact, in general, it is very important for teachers to show a positive aattitude towards innovation in the success of every innovation put into practice. When the literature is examined, it is seen that there are many different researches conducted on the "teachers and technology" issue. Teachers' attitudes towards technology (Albirini, 2006; Mohamed, 2018; Mukti, 2000; Sugar, Crawley and Fine, 2005; Liu and Szabo, 2009), teachers' acceptance of technology (Holden & Rada, 2011; Jeong & Kim, 2017; Teo & Zhou, 2017; Yuen & Ma, 2008), teachers' technological pedagogical content knowledge competences (Banister and Reinhart 2011; Hewitt, 2008; Phillips, 2016; Turgut, 2017; Vaerenewyck, Shinas and Steckel, 2017) teachers' resistance to technology (Howard, 2013; Rakes and Dunn, 2015; Thang, Lin, Mahmud, Ismail and Zabidi, 2014; Westberry, McNaughton, Billot and Gaeta, 2015), the difficulties teachers face in technology (An & Reigeluth, 2011; Brush, Glazewski & Hew, 2008; Heath, 2017; Wood, Mueller, Willoughby, Specht & Deyoung, 2005) are the main research topics.

This research focuses more on the resistance behaviors caused by the problems teachers face in using technology. For this research, resistance to the use of technology should be understood as the educational technology that teachers resist to use. Educational technology, according to Januszewski and Molenda (2008: 1), is the research and ethical practice of promoting learning and enhancing performance by designing, using and managing suitable technological processes and resources. These processes and resources may be accepted as; computers, mobile devices, softwares and programs (virtual reality applications, virtual learning environments, multi-dimensional digital learning environments, digital stories, etc.), interactive boards, smart boards, projection devices, audiovisual devices usb player, cd player, tape and etc. The concept of resistance in this

research is the resistance of teachers to use the above mentioned technological processes and sources in learning-teaching processes that will facilitate students' learning.

Raman, Malik and Sofian (2015) states that development of computer innovation as a learning apparatus significantly changed the conventional concept of educating and computer is considered as implies of accomplishing the instructive objectives where instructors part is as like a facilitator. Be that as it may, whereas the instructors state of mind is an imperative issue on joining computer in cutting edge classrooms, the victory of any activities to execute innovation in an instructive program depends emphatically upon the bolster and demeanors of instructors included (Teo, Lee & Chai, 2008). According to The Education Week Tech Confidence Index (2016) research entitled "teachers' views on educational technology" conducted with 700 K12 teachers; teacher's overall level of confidence in educational technology translates into a distinct set of behaviors, perceptions, and choices in the classroom. Despite challenges, teachers have stated overwhelmingly that technology has enabled them to be more effective, and they enjoy the fact that digital resources help save time and monitor student progress (Lestch, 2018). Moreover, now is a moment of urgency in education and access to highquality education has never been more crucial for today's students to succeed ina digitally integrated world and ensuring that educators are ready to perform this daunting challenge is the most important endeavor we can undertake as a society (Culatta, 2017), but there is a problem between the potential and realization of technology integration in schools. Even though many teachers acknowledge the value of technology as an educational tool, they are still reluctant to incorporate it into their classroom lessons (Himsworth, 2007). Although many novelties on educational technologies are now being announced, it would be a compelling opinion to say that teachers use the technology at an expected level effectively (Fabry & Higgs, 1997; Teo, 2011).

Moreover the utilization of instructive advances in course applications and their reflections on the instruction have not come to to wanted levels nowadays; in other words, there are issues within the integration of innovation into educating and utilizing innovation in conjunction with the information of subject field and instructional method (Akay, 2017). A unique area of transition and risk also remains the application of technology in contemporary education. The availability of technology has increased dramatically in schools over the last decade, but teachers tend to struggle with, and even seem resistant to, the introduction of technology into their practice (Howard, 2013). Herewith, this research mainly focused on the resistance of teachers to technology arouse from several barriers and problems.

What Is Resistance?

There are different answers specific to the areas of the answer to the question of what the resistance is. While resistance is defined as the act of fighting against something that is attacking you or refusing to accept something or a force that acts to stop the progress of something or make it slower in Cambridge Dictionary (2018), it is defined as the refusal to accept or comply with something as in Oxford Dictionary (2018). Resistance in psychology is given as the resistance refers to patients blocking memories from conscious memory by Freud

more generally, however, the term is used to describe the direct or indirect opposition of a patient to the therapeutic process (Fournier, 2018).

When it comes to education, it is seen that resistance is mostly defined as student resistance and it is mostly studied in this context. According to Giroux (2001: 107) resistance is a valuable theorotical and ideological construct that provides an important focus for analyzing the relationship between school and the wider society. Yüksel (2003), states that resistance is the behavior of the student against the educational activities in the school, and the concept of student resistance was first defined by resistance theorists within the neo-Marxist educators. However, the concept of resistance for this research is defined as refusal of the teachers to accept something or to comply with something.

Defining Teachers' Resistance To Technology

Educational systems are influenced by technological developments such as other systems and technology emerges as an important facilitator and a motivating factor in learning-teaching processes. In implementing such innovations, teachers are vital mediators in the integration of these technologies into classes. Unfortunately, this integration process cannot be integrated into the courses in line with the speed of development of technologies. One of the reasons for this negativity is the resistance behaviours of the teachers towards using educational technologies. Concurring to Arar, Yousef, Ismael and Badarni (2016) those who contradicted and stood up to the alter, were recognized as instructors who were not recognizable with the innovation and saw the alter as a danger to their educating strategies and those who experienced specialized issues due to need of encounter and aptitudes within the utilize of computers.

Ertmer (1999) defines two types of barriers to technology integration. "While the first-order barriers to technology integration are described as being extrinsic to teachers and include lack of access to computers and software, insufficient time to plan instruction, and inadequate technical and administrative support, in contrast, second-order barriers are intrinsic to teachers and include beliefs about teaching, beliefs about computers, established classroom practices, and unwillingness to change (Ertmer, 1999)." The lack of design thinking by teachers is described as the "third"-order barrier for technology integration (Tsai & Chai, 2012).

Howard (2013) labels the teachers who do not integrate technology as 'resistant' to change. But the vital question is why do teachers resist to the use of technology? According to the Promethean The State of technology in Education Report (2017) which was conducted with 1600 educators in UK; many teachers feel that there is increasing pressure to use technology for technology's sake, rather than when it is relevant to teaching and learning. And they are still not aware of how technology can aid teaching and learning and they are still lack confidence when it comes to integrating technology into the classroom. According to the same report it is also stated that newer technology is not always being put to good use by teachers, and four key barriers to adoption were uncovered. These are; concerns about security, failing technology, lack of time and lack of training and

unwillingness. In addition, another important parameter for resistance behaviour in using educational technologies is age/years of experience. It is known that older teachers are more prone to show resistance behaviors. In other words, adaptation of young teachers to new technologies is faster than older teachers.

As a result, resistance to technology; is the process of opposing the use of technology in education due to the physical characteristics (such as age) of the teachers, the cognitive and affective difficulties they encounter in the use of technology and the inadequate technological infrastructure and their background. In other words, and briefly, the resistance of teachers to the use of technology in education can be defined as opposing the use of technology in education.

Research Gap and Aim of the Research

For the near future, the problems around technology, teaching and transition are not likely to be tackled. In reality, teaching and technology will continue to evolve, and it is only with this awareness that teachers can be encouraged to make informed decisions about technology and teaching, rather than resisting evolve with the heat of emotion (Howard, 2013). Teachers teach as instructed, and computer skills are unlikely to be passed to students and promoted by teachers unless the teachers have positive attitudes towards computer use (Yıldırım, 2000). When the literature was examined, studies on the attitudes, beliefs, qualifications, self-confidence, acceptance of the teachers related to technology have been found. However, it has been observed that these studies mostly used quantitative data. A few qualitative studies on resistance have been also found in the literature, but no meta-synthesis study has been found which aims to to explain the causes of resistance behaviors and solutions to overcome the resistance of the teachers.

Therefore, this research is believed to fill this gap in the literature. In conclusion, the aim of this study is to synthesize the qualitative data derived from the studies focused on the resistance of teachers and barriers to technology in education in the last 20 years. The research problems are developed as: 1.Why do teachers resist technology in education? 2.What can be done to prevent or to break the resistance of the teachers to technology? This second sub-problem was developed due to the a problem stated in the literature and defined by Heath (2017) as "While significant literature exists that examines barriers to technology integration, there is a need to examine what supports might assist teachers in crossing the threshold."

METHOD

Although meta-synthesis research is used effectively in medicine and nursing (Barroso & Powell-Cope, 2000; Cubis, Ownsworth, Pinkham and Chambers 2018; Sandelowski, Docherty and Emden, 1997) it is seen as a newly preferred method in education sciences in recent years (Aspfors & Fransson, 2015; Brown, 2017; Craggs & Kelly, 2018; Holland, 2019; Wilder, 2014). There has been an imperative to further qualitative studies into metasynthesis (Bondas & Hall, 2007). Sandelowski and Barroso (2006) define qualitative meta-synthesis as an interpretive integration of qualitative findings and it is more than summary in that it offers novel interpretations

of findings. Moreover, they state that these interpretations wiill not be found in any one research paper, but rather are derived from taking all of the reports in a sample as a whole.

In this research *Enhancing transparency in reporting the synthesis of qualitative research* (ENTREQ) statement was used to conduct the research. The ENTREQ statement was developed to promote explicit and comprehensive reporting of the synthesis of qualitative studies (Tong et al., 2012). According to Erwin et al. (2011) the qualitative meta-synthesis research process is summarized into six steps and gives a basic description of the qualitative metasynthesis process with examples drawn from the literature. The six steps of qualitative meta-synthesis research process are:

"Step 1. Formulate a Clear Research Problem and Question

Step 2. Conduct a Comprehensive Search of the Literature

Step 3. Conduct Careful Appraisal of Research Studies for Possible Inclusion

Step 4. Select and Conduct Metasynthesis Techniques to Integrate and Analyze Qualitative Research Findings

Step 5. Present Synthesis of Findings Across Studies

Step 6: Reflect on the Process"

"Step 1. Formulate a Clear Research Problem and Question:" In the case of qualitative metasynthesis research, it is important to present the research problem in a clear manner. As the aim of synthesizing the qualitative data is to synthesize and interpretate the findings within the scope of the research topic, the research problem should be structured in a good and understandable way. Otherwise, your synthesis may not contribute to a deeper understanding of the problem, no matter how high quality and comprehensive it is. This research's problem focuses on a process connected with the use of technology by teachers, which is widely studied in education literature. In the literature review to create the problem of this research, many studies have been found on the use of technology that tell all work related with technology is going well. The teachers' attitudes towards technology, their perceptions, their self-confidence and their ability to use technology have been very much in favor of teachers. Although it is known like that a few researches in the literature draws an attention to the utilization of technology by teachers is not at the desired level. For this reason, the problem of the research is to contribute to the literature by synthesizing the findings of different qualitative studies on this problem, which is a need in the field.

"Step 2. Conduct a Comprehensive Search of the Literature:" Following databases were undertaken to identify the research reports: Emerald, Tandfonline, Eric, Proquest, Wileyonline, Researchgate and Google Scholar. The timeframe of the search procedure was 1998-2018. The reason for the selection of 1998 as the starting point of the research was to find the first research in the literature search, which includes the words of the teachers'

resistance to technology as in the title. Key search terms included "allintitle: teachers'+resistance+technology", "allintitle: teachers+resistance+technology", "allintitle: teachers'+resistance+information and communication technologies" and "allintitle: teachers'+resistance+ICT"   "allintitle: teachers+resistance+information and communication technologies" and "allintitle: teachers+resistance+ICT" keywords. Furthermore, in the writing of the article, journal's publication ethics was complied with.

"Step 3. Conduct Careful Appraisal of Research Studies for Possible Inclusion:" After the inclusion and exclusion criteria (as shown in Table 1) were applied for this qualitative meta-analysis study, 10 studies were subjected to meta-synthesis as shown in Figure 1. There is a wealth of information contained in each study, and therefore there are recommendations of 10 (Sandelowski et al., 1997) to 12 studies (Paterson et al., 2001) (As cited in Bondas and Hall, 2007).

Table 1. The Inclusionary And The Exclusionary Criteria Of The Studies

The Inclusionary Criteria Of the Studies	The Exclusionary Criteria Of the Studies
a)qualitative or mixed method-based research	a)researches that provide only quantitative data
b)researches involving direct expressions	b) researches in the form of literature review
c) researches on teachers' technology resistance	c) non-English studies
d) full text article, full text thesis	
e) surveys in which the teachers in duty are taken as samples	
f) studies in prestigious and scientific indexes or databases	
g) studies conducted over 20 years between 1998-2018	

The inclusionary and the exclusionary criteria of the studies shown on Table 1 were decided by the author regarding the meta-synthesis method principles and considering the charectirstic of this research topic. The studies providing qualitative data based on teachers' technology resistance, dating back 1998 to 2018, published in prestigious and scientific indexes or databases were chosen for meta-synthesis analysis. The studies providing only quantitative data, researches in the form of literature review and non-English studies were excluded.
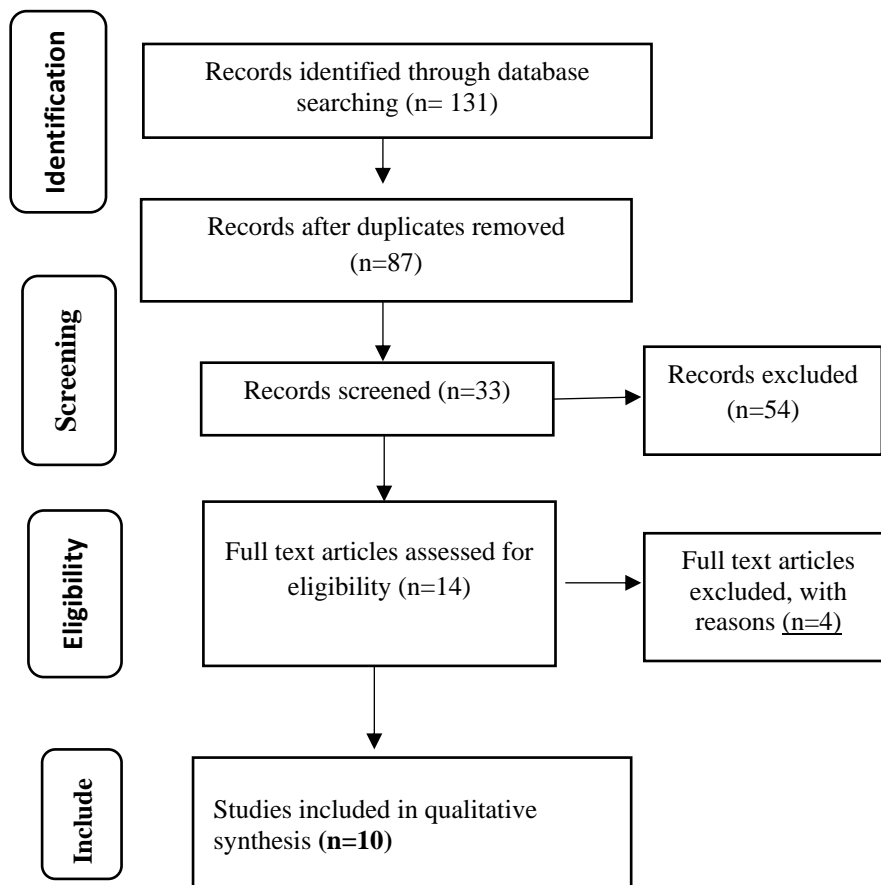
Figure 1. Flow Of Information Through The Different Phases Of A Systematic Review.

Source: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009)

The author identified 131 studies regarding the inclusionary criteria. 121 studies were excluded from the process because of the dublication publishing, not display in full text, not accessible on the databases and with other reasons. As a result 10 studies were included for the meta-synthesis analysis through the phases of systematic review developed by PRISMA group.

To assess the quality of the qualitative articles, Critical Appraisal Skills Program (CASP) can be used (Sibeoni et al. 2017). "The CASP tool contains 10 questions designed to help readers appraise qualitative research reports broadly in terms of rigor, credibility, and relevance (Chenail, 2011)." The assessment was conducted independently by two expert researchers. In the process of the assessment of the quality of the qualitative studies, the coding reliability was examined by the Miles - Huberman formula. According to the Miles and Huberman coder reliability formula, the reliability percentage is obtained from the formula (Reliability Percentage= Agreement / (Total Agreement + Disagreement)) and at least 80% reliability is expected to be obtained (Miles and Huberman, 2016).

Table 2. Critical Appraisal Skills Program (CASP) Summary, By Criterion.

Criteria	Example	Quality assessment of studies(summary)		
		Met criterion	Partially met	Did not meet
Aims	"Explicitly stated aims/objectives of research"	6	3	1
Method	"Appropriate use of qualitative methods"	6	2	2
Research	"Justification of the specific research design"	8	0	2
Design Sampling	"Appropriate sampling strategy, description of recruitment, discussion around recruitment"	8	2	0
Data collection	"Appropriate description of data collection methods"	8	2	0
Reflexivity	"Critical examination of researchers' own role and potential bias in data collection and analysis"	4	2	4
Ethical Issues	"Evidence of approval by an appropriate body"	3	0	7
Data Analysis	"Adequate and in-depth description of analysis process, sufficiently rigorous data analysis"	8	1	1
Findings	"Clear statement of the findings, discussion of evidence, credibility, integrity"	9	1	0
Value of Research"	"Contribution to existing knowledge, transferability	8	2	0

Source: Sibeoni J, Orri M, Valentin M, Podlipski M-A, Colin S, Pradere J, et al. (2017)

The studies were analyzed through CASP criterion shown in Table 2 in order to put forward the quality of the qualitative studies. The aims, method, research design, sampling, data collection, reflexivity, ethical issues, data analysis, findings and value of research criteria were taken into consideration by the two expert researchers. In order to present the reliability between these two expert' codings Miles-Huberman coder reliability percentage (%96) was obtained. The result indicated that the reliability between the two researchers is reliable.

The characteristics of the studies used in the meta-synthesis (N=10) were analyzed according to the author, the method of the study, the data collection tool/s, the sample size, the data analysis, the country of the studies, the study type and the database retrieved from by the author. The characteristics of the studies used in the meta-synthesis (N=10) were shown in Table 3.

Table 3. Characteristics Of The Studies Used In The Meta-Synthesis (N=10)

Author/ Year	Method	Data collection tool	Sample size	Data analysis	Country	Study type	Database
Heath, 2017 (2)	Case-study	Interview	7	Phenomenologalogy	USA	Article	Tandfonline
Singleton, 2017 (10)	Qualitative	Semi-structured interview	20	Content analysis	USA	Doctoral dis.	ProQuest
Westberry et. al., 2015 (4)	Ethnographic approach	Video-conferencing	17	Content analysis	New Zealand	Article	Tandfonline

Nikian et. al., 2013 (1)	Qualitative	View questionnaire	7	Interpreting	Malaysia	Proceeding	Google Scholar
Howard, 2013 (6)	Case study	Interview	8	Content analysis	Australia USA	Article	Google Scholar
Al-ruz and Qablan, 2011(5)	Multi-case study	Interview	17	Content analysis	Jordan	Article	Researchgate
Mayya, 2007 (7)	Qualitative	Open-ended questionnaire	76	Content analysis	India	Article	Google Scholar
Himsworth 2007 (8)	Mixed-method	Open-ended questionnaire	7	Direct verbal narrating	USA	Doctoral dis.	ProQuest
Wood et. al.2005 (3)	Qualitative	Focus-group	54	Thematic analysis	Canada	Article	Tandfonline
Coghlan, 2004 (9)	Case-study	Interview	4	Content analysis	USA	Doctoral dis.	ProQuest

"Step 4. Select and Conduct Metasynthesis Techniques to Integrate and Analyze Qualitative Research Findings": A constant comparison method was used in this research, analyzing subsequent articles in comparison with other studies. This synthesis approach was used by Tong et al. (2008) which was a modification of techniques described by Noblit and Hare (1988) and by Campbell et al. (2003)(As cited in Erwin, Brotherson and Summers, 2011). And according to Erwin et al. (2011), the researchers read each article repeatedly to ensure that all concepts and relationships are explored and the format of first-order, second-order, and third-order constructs are used to analyze and reinterpret the studies in this method. First-order constructs are true to context with quotes from original participants, second-order constructs are interpretive themes developed by the original researchers, and third-order constructs are derived from the synthesis of multiple studies that constructed new and common themes.

FINDINGS and DISCUSSION

"Step 5. Present Synthesis of Findings Across Studies:" The most important step of meta-synthesis research is the synthesis of qualitative data. In this context, first-order and second-order data of each study are presented in Table 4 to present the findings of the first sub problem of the research "1.Why do teachers resist technology in education?".

Table 4. First-order (lack of access to computers and software, insufficient time to plan instruction, and inadequate technical and administrative support) Based Resistance Behaviours

	Quotations from participants in primary studies	Interpretations of findings offered by authors
Insufficient time	"The connection is so slow and I lose more than 25 minutes of my class time to open the desired page. 5"	"One of the the next major constraints reported by the participants is insufficient time in preparing technology-based lessons.1"
	"The biggest problem that I had with it [computers] actually, was the lack of time I had to sit down and come to terms with it.6"	"That 'time' was identified as a persistent barrier by teachers in terms of fitting in curriculum, planning lessons, troubleshooting computer glitches, and teacher training and development.3"
		"The teacher does not have required time to use the computers.7"
Lack of access to computers and software	"The thing is it's difficult to book in times for your class to use the computer lab because there are so many classes. 3"	"The participants were in unison when identifying the lack of computers as the major obstacle to using computer-based teaching in the classroom.1"
	"We have problems in our school's infrastructure; problem is related to the ratio of computers to students, the present ratio is 10 students to one computer. 5"	"The secondary teachers frequently mentioned getting access to computers in labs as a necessary component of their instruction and that access was not always available. 3"
	"I'm limited by the software that the county has chosen for me. The county has only chosen software in a very general sense. They have not chosen software that is content specific.2"	"The previous paragraphs demonstrated that all participating schools are equipped with several ICT resources but the popular use of these resources is for handling schools' administrative work, communicating with teachers, students and their parents. However, only few numbers of these schools utilize their ICT resources for teaching. 5"

(The numbers given at the end of the constructs indicate which article they belong to.)

Insufficient time, lack of access to computers-software and inadequate technical and administrative support were the first-order barriers according to the findings obtained from the meta-synthesis process. Teaching is not only a period of time spent in class or in-school periods due to the nature of the profession. In classroom or out-of-school activities, they are quite time-consuming activities in a teacher's life. In addition when the processes (teachers' efforts to facilitate the students' reaching the attinments stated in the curriculum, efforts to give the content on time, the time spent in in-service trainings, self-development activities and so on) are considered, it is acceptable to complain about time. Therefore, teachers need a long time to integrate themselves into new technologies. According to Mumtaz (2000), teachers too need time to focus on and study what's happening while implementing new technologies. Timetabling does not provide flexibility for such learning due to the demands of work inside and outside the classroom. Additionally, the lack of time required for teachers to effectively

incorporate technology into the curriculum is a recurrent problem (Afshari, Abu Bakar, Su Luan, Abu Samah and Fooi, 2009), as the lack of time in the integration phase will adversely affect the process.

Lack of access to computers-software and was the second barrier derived from the meta-synthesis process. A lot problems were stated in this barrier. These were; lack of computers, getting access to computers in labs, the difficulties of moving a class of young children to a lab for computer instruction, digital division, use of the resources for handling schools' administrative work, insuffieceint class infrastructure, persistent and unresolved technical problems, the issue of slow and unreliable connectivity, outmoded our computers. Although Wachira and Keengwe (2011) note that the teachers cited lack of hardware and sufficient software as the primary barrier to technology integration in their study, Keiper, Harwood and Larson (2000) say the lack of control creates unease about relying too heavily on incorporating computer technology into the curriculum proposed.

Inadequate technical and administrative support was another barrier. Lack of financial incentive like additional pay to learn how to use a computer, inadequate support from administrators for technology integration, the lack of technical support and in-service trainings have been declared as the problems. Strong administrative and collegial support in conjunction with perceived rewards for change are solutions that may be necessary to push these teachers to alter their thinking (Himsworth, 2007).

Therefore, if they are to fulfill the needs of their students for the next century, it is important for reachers to have sufficient technology training during their preservice education (Yıldırım, 2000). Technology providers should provide assistance and ongoing training and/or professional development to the schools and teachers they are working with, creating a trusting relationship based on understanding their needs," according to the analysis (Lestch, 2018). Availability of computers, organization of equipments for the access of everyone, providing tech-expert teachers, collaborative and risk taking leadership, school leaders supporting innovation, providing the support and the adequate time, a cohesive framework for facilitating professional development by school districts were the key concepts to the adaptation of the technology by the authors of the studies used in meta synthesis research.

Table 5. Second-order (beliefs about teaching, beliefs about computers, established classroom practices, and unwillingness to change) Based Resistance Behaviours

	Quotations from participants in primary studies	Interpretations of findings offered by authors
Teacher beliefs, attitudes	*"When we are doing graphs, I know there is a computer program where you can type in the equation and it will graph it for you, showing thousands of points. I can't really see the value in that because that's not how they are going to be graphing in a normal classroom or in an exam situation. So, its fine that it pops up quickly and I can see what it looks like, but that's not the way we are going to graph it on an exam.6"* *"It makes me feel anxious, yes. I worry something will go wrong, whether the lesson will progress smoothly or not, will there be problems. Yeah, I think I would be wary.6 I could do without it because I like my student learning how to do certain things the old fashion way.10"* *"Honestly speaking, I feel that our society has become entirely too dependent on technology. I recognize the benefits of technology use in schools; however, I feel that people should not forget some of the older teaching methods.10"*	"They were 'fed-up' with constant change and afraid to plan computer integration only to be let down again.3" "They believed pedagogy should lead technology, not the reverse.4" "The teacher experienced high anxiety and uncertainty when using technology, which suggested a strong negative affective response. Second, she did not believe technology was relevant to her teaching. Finally, she was not motivated to change her practice and there was little social pressure for her to change.6" "Resistance to change is a factor which prevents the full integration of ICT in the classroom. This resistance can be seen in terms of teachers' unwillingness to change their teaching practices, and also in terms of institutions finding it difficult or being unable to re-organize in ways which facilitate innovative practices involving ICT.7" "Some elementary teachers related a lack of confidence in their own computer knowledge and stated that as a barrier to including it in their planning. 3"

Table 6. Third-order (instructional design) Based Resistance Behaviours

	Quotations from participants in primary studies	Interpretations of findings offered by authors
Designing the instruction	*"The biggest challenge is my kids were not productive natives. They're social media natives. But when you ask them to have different productive software programs open at the same time and have to manage that, that was not easy. 2"* *"I don't think we have adequate curriculum in place to use technology to the fullest.10"* *"Everything was extremely slow and painful to the point where it was becoming hard to teach. The technology was keeping us from teaching. 2"* *"All this technology absolutely puts a down on that whole teaching system, because you have to abide by some rules, that you have to go on with the flow and be on camera and be on shot.4"* *"Teachers don't like to use computers and their software because they are afraid of using the new stuff from overtaking their teaching role. 5"*	"The secondary teachers talked about curriculum and how computers did or did not fit within the content they were teaching.3" "However, the utilization of the available e-content in teaching most curricula is narrowed on only answering the enrichment activities that accompany each lesson. This limitation in the use of the Eduwave's content was attributed, by most participants, to several reasons such as shortage in computers, poorly maintained computers, shortage in educational content, and slow Internet connectivity.5" "A perhaps more serious barrier lies in the fact that tutors often have little experience of using technology to deliver the curriculum.7"

Teacher beliefs, attitudes and difficulty of adapting technology to instructional design were the second and third-order barriers according to the findings obtained from the meta-synthesis process. High anxiety and uncertainty when using technology, unmotivated to change the usual instructional practice, resistance to change, lack of confidence in their own computer knowledge, getting used to older teaching methods. According to Kim, Kim, Lee, Spector and DeMeester (2013), It appears that teacher beliefs affected their technology integration activities among other factors and that if adequate support is given to teachers according to their beliefs, their degree of technology integration could be improved. Chiu and Churchill (2016) also state that; school teachers 'values, attitudes and anxieties are key factors affecting the acceptance, adoption and incorporation of mobile devices in teaching and recognizing this change in convictions and attitudes can help schools prepare, introduce and maintain the effective introduction of mobile technology.

CONCLUSION

"Step 6: Reflect on the Process:" In the sixth step, as a result of qualitative data synthesis the suggestions to eliminate these resistance behaviours were discussed separately to present the findings of the second sub-problem of the research "2.What can be done to prevent or to break the resistance of the teachers to technology?". In addition, this discussion process is a presentation of the third-order constructs that are derived from the synthesis of multiple studies.

The meta synthesis research revealed some key concepts for the adaptation and acceptance of the technology. These are; providing positive belief in technology, empowerment of the teacher beliefs by the policymakers and school leaders, careful planning in the form of adequate support and time to effectively resituate beliefs and practices, encouraging teachers in an educational climate that includes staff development, specific training in ways to use computers and software as well as in ways to integrate these pieces of software in their teaching, professional development beyond computer user proficiency and new visions for teaching and learning with technology were the key concepts to the adaptation of the technology by the authors of the studies used in meta synthesis research.

Technological equipment should be designed in such a way as to ensure full access for all users (Mayya, 2007), and many computer teachers are more or less accustomed to the technology than the often recruited skilled technicians. Providing some basic training and a lot of trust to these teachers will save time and resources for a school and a school system (Al-ruz & Qablan, 2011). Digital technology incorporation is not as simple as providing tools and resources when it comes to instructor values and attitudes, but is often influenced by views, attitudes and attached meanings (Wood et. al, 2005). On the other hand, according to Heath (2017), though teachers 'confidence in technology is necessary for technology adoption and teachers with a positive belief in technology can successfully introduce technology in their classrooms through their own professional agency; Westberry et. al. (2015) noted that teachers are still on shifting sands as they implement technology and that it is necessary to

provide firm ground underneath their feet through careful preparation in the form of adequate support and time to restore beliefs and practices effectively.

The other key concept for the adaptation and acceptance of the technology were the attitudes of the policymakers and school leaders. Thus, policymakers and school leaders are encouraged to motivate teachers by building capacity and promoting the creation of positive teacher values well ahead of technology interventions (Heath,2017). Additionally, the role of college leadership is clearly central in meeting some of these constraints (Mayya, 2007). Al-ruz and Qablan (2011) added that the Ministry of Education needs to make a commitment to help teachers effectively integrate computers and Internet technology into their schools by aligning curricula, assessments and resources with the educational results they plan to achieve. Another point is, by looking at how educators interpret their teaching experiences, school districts can design a cohesive framework for facilitating professional development and professional development needs to go beyond computer user proficiency and look at how new visions for teaching and learning are possible with technology (Himsworth, 2007).

As a result, it is important that technical improvements be implemented either in a manner that is consistent with the existing expertise and working methods of teachers, or with the resources and time required to restore them effectively (Westberry et al., 2015) and teachers need more detailed instruction on how to use computers and apps, and how to incorporate these apps elements into their teaching (Al-ruz & Qablan, 2011). And Himsworth (2007) drew the attention to a well-defined vision for school change as the first step toward technology integration.

RECOMMENDATIONS

Finally, although technology has a very important place in every aspect of our lives, unfourtanetly teachers' use of technology cannot be realized at the same level. This meta-synthesis study has tried to put forward that there are many reasons for this inadequate realization and what might these reasons are. As a result of this study, it is expected that the reasons and solution suggestions for eliminating teachers' resistance to technology will contribute to teachers, school administrators and educational political decision makers. In addition to the resistance behaviors that emerge as a result of this meta-synthesis research these implications can be made for future researchers; researching the students' ability to use technology and their resistance towards using educational technology, examining how user-friendly the instructional technologies are produced and how the use of excessive technology may affect teachers' educational activities.

ETHICAL TEXT

In this article, journal writing rules, publishing principles, research and publishing ethics rules, journal ethics rules are followed. Responsibility belongs to the author for any violations related to the article.

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