

Review

Teacher Perceptions about ICT Integration into Classroom Instruction

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Abstract: This study looked at qualitative papers that focused on teacher perceptions of how technology is integrated in the classroom. It synthesized 22 qualitative research studies using the meta-ethnography method to trace, assess, and synthesize the findings in order to gain a better understanding of the diversity of teacher perceptions concerning ICT integration in the classroom. The outcomes were determined by the positive and negative attitudes teachers had toward ICT integration in the classroom. The synthesis revealed that local settings and global educational trends both influence teacher perceptions. It is stated how crucial teacher professional development programs are, and contextual elements influencing teacher perceptions about ICT integration into classroom are highlighted. Recommendations for further study are explored by integrating the review's findings.

Keywords: teacher perceptions; ICT integration; educational technology



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1. Introduction

Recent research [1,2] has found that using Information and Communication Technology (ICT) in the classroom is now an essential part of teachers' development of their ICT pedagogical practice abilities. The perspectives of teachers are essential for successful ICT integration and a key factor in determining whether or not they use technology in the classroom [3]. Effective integration of technology is the result of many factors, but the most important factor is the teachers' competence and ability to shape instructional technology activities to meet students' needs [3,4]. Teachers who integrate ICT in the classroom demonstrate some degree of confidence, collaboration, and cooperation [5]. However, there is still a long way to go in terms of training and practice [6,7]. Further research affirms that teachers' use of ICT in the classroom enhances learning and brings about the best in students' capacity for active learning [8].

A few issues that have been mentioned as indicating teachers' difficulties integrating ICT in the classroom include a lack of training, insufficient time, and a lack of resources [9]. To close the gap between teacher perceptions of ICT integration in the classroom and their lack of preparation, more research is still required to fully understand how teachers perceive ICT in the teaching and learning process in the classroom. In order, to find, critically assess, and synthesize the information supporting teacher perceptions on incorporating ICT into classroom teaching, a synthesis of qualitative research was used.

2. Background

2.1. Defining Teacher Perceptions

Due to the variety of definitions used in the literature, one challenge has been to precisely describe teacher perceptions [7,10]. Perception, according to Eteokleous [11], is how something is viewed, understood, or interpreted. Eteokleous [11] (p. 309) substituted belief for perception since it is common for perceptions to "travel in disguise and under an alias". Additionally, researchers provided a thorough list of terms used to describe perceptions

in the literature, such as attitudes, values, thinking, judgments, dispositions, perspectives, opinions, ideologies, and conceptions [12]. Usually, perceptions serve as personal compass points that help people define and understand the world and themselves [11].

The absence of initial and continuous technology training as well as a simplified procedure for integrating ICT into curriculum and instruction are two factors that affect teachers' attitudes towards employing technology in instruction [8]. Teachers worry about a lack of technological training and technical support and the dependability of software and hardware are correlated with their attitudes toward ICT integration. According to Marshall [8], teachers believe that ICT skills are difficult for them to learn, and they have too many students and little time to integrate ICT into their usual lesson plans. In addition, Cope and Ward [13] found that most teachers used ICT in their classrooms regularly when they had appropriate technical know-how, adequate classroom access, and a technology philosophy supporting meaningful learning.

Teacher perceptions on the use of ICT in the classroom have been categorized into two categories: teacher centered perceptions and student-centered perceptions [14]. Teacher-centered perceptions often emphasize following moral principles and rules, and they are linked to behaviorism [14,15]. In a structured learning environment, teachers organise the process of learning attainment in the capacity of a skilled expert. In contrast, teachers who have a student-centered perspective place more focus on the needs and welfare of individual students. They commonly adopt constructivist-inspired teaching methods. Student-centered approaches often place a priority on students' active engagement in realistic disciplinary tasks utilizing real tools of the discipline [15]. Furthermore, researchers [2] provide evidence to support the idea that teachers may have ideas on teaching that are both teacher- and student-centered. As a result, scholars are being recommended to employ a comprehensive approach while researching teachers' perception systems [10].

2.2. Teacher Perceptions on Integrating Technology

Research on teacher perceptions has been conducted for more than 60 years [16], and it offers solid support for the idea that perceptions play a significant role in influencing teacher behavior in the classroom [17]. Since perceptions are thought to influence how and why teachers may or may not adapt their teaching to embrace a new curriculum, adopt new instructional practices, and implement new initiatives, perceptions of teachers are a frequent topic of research in the context of ICT integration. Teacher perceptions appear to be a significant predictor of integrating technology [18,19]. However, teacher perceptions might also act as a barrier to ICT integration. For instance, one teacher might consider the open nature of (some) technological solutions to be pedagogically inappropriate since they feel direct instruction is the most effective mode of instruction [20].

There are two common research issues of how teachers view technology. The first is that studies on teachers' viewpoints typically hold a broader perspective than studies on ICT integration [21]. The majority of research on ICT integration focuses on how people evaluate the role that technology plays in education [12,22]. Focusing just on perceptions about teaching and learning misses the intricate and multifaceted nature of being (and becoming) a teacher given the vast range of perspectives among teachers. Teachers are shown to hold perceptions about numerous challenges, including perceptions about teaching. For instance, secondary school teachers in Lasky's [23] study indicated that rather than just having ideas on how students learn, teachers base their decisions on a more thorough and nuanced viewpoint of students and their basic institutional education. Because of this, teachers' decisions on whether to utilize ICT (and how to use it) depend on whether they think it helps them achieve their pedagogical objectives or not.

The second issue is that ICT integration research typically ignores the context, despite the fact that it has a significant role in shaping teachers' attitudes and beliefs [17,24]. For instance, at the current stage of study on teachers' attitude toward ICT integration in classroom instruction, the usage concepts and data collection instruments established in and for a different educational setting have been criticized [25].

In a study of teacher perception of the values that are needed to be an “exemplary” user of technology in the classroom, Hsu [26] found that the better trained the teacher was in the use of technology, the more likely he or she was to successfully integrate it into classroom instruction. Zinger et al. [22] discovered that, on the other hand, schools with a higher socioeconomic status incorporated technology much more readily because teachers are confident that students have better access to ICT at home and can, therefore, complete homework in which technology is necessary for the completion.

3. Purpose of the Study

This paper reviewed current qualitative research literature through meta-ethnography [27] to deliver a nuanced understanding of the diversity and function of teacher perceptions about ICT. The emphasis is on research that has been carried out in the area of integrating technology into classroom learning. There are two reasons why this review research is appropriate. The first is that integrating technology into classroom instruction offers a useful setting for examining teacher perspectives on technology-assisted instruction. The second reason is that this field of study deals with discrepancies between beliefs and actions. In an effort to respond to the two key research questions:

- (1) How do teachers perceive, both positively and negatively, about integrating technology in the classroom?
- (2) What contextual elements/factors influence teacher perceptions on using technology in the classroom?

4. Research Method

4.1. Meta-Ethnography as a Review Method

A systematic literature review was used to critically evaluate, summarize, and reconcile the evidence for this study. The meta-ethnographic method [27], which has been used to synthesize qualitative research in a number of disciplines of study, including the integration of educational technology, was employed in this paper’s review [28]. As opposed to merely compiling past study findings, meta-ethnography achieves a level of conceptual or theoretical development and uncovers what is concealed in individual studies. The study employed participant narratives to interpret the phenomenon being studied, drawing on Shojania et al. [29].

4.2. Procedure of Review

Table 1 provides a summary of the review procedure, while the following subchapters explain in greater detail.

Table 1. Review procedure (based on [27]).

| Step Information | |
|------------------|--|
| 1. | Starting as the first step |
| 2. | Determine what is pertinent to the initial research interest and find the pertinent research |
| 3. | Evaluation of quality |
| 4. | Read the studies |
| 5. | Identify the connections between the studies |
| 6. | Translate several academic disciplines |
| 7. | Put the translations together |
| 8. | Incorporate the synthesis |

4.2.1. Starting as the First Step

The goal of this study is to offer more in-depth knowledge of the differences in teacher perceptions on ICT integration. The type of evidence a qualitative method can produce is what gives qualitative research its added significance in this context. Since they do not limit participants’ choices to a fixed set of predetermined answers, qualitative data collection

techniques can better capture the opinions and perspectives of the participants than closed-question surveys [12]. Table 2 presents the search approach and selection standards.

Table 2. Search strategy and selection criteria.

| | Decision Taken | Justification |
|--|--|---|
| Methods used for finding relevant research | Databases: ProQuest (Ed. Database), EBSCO, ERIC, Web of Science | The initial searches were carried out using all main databases that were accessible through university services since using numerous databases and search engines produces comprehensive results. |
| Keywords | Teachers perceptions AND ICT OR digital OR computer OR ICT integration | Keywords such as technology, digital, and computer were preferred. All papers dealing with perceptions, such as attitudes, views, opinions, and beliefs were included in this review. |
| Search area | Title, abstract, and keywords | For the initial search, a large search area was chosen so that it would be inclusive rather than exclusive. |
| Time space | From 2015 to 2021 | This was chosen under the presumption that research on ICT integration in the context of education has been most dynamic during this time period. |
| Language | English | Academic publishing is primarily in English. |
| Selection criteria | A qualitative empirical study involving teachers must include quotations from the original | Reviewing teachers' opinions was of general interest, and the studies that were assessed had to go into great detail concerning teacher perceptions. |

4.2.2. Determine What Is Pertinent to the Initial Research Interest and Find the Pertinent Research

Figure 1 below, depicts the literature retrieval procedure used in this research. During the protocol phase, inclusion and exclusion criteria was used to facilitate the selection of relevant studies. The 110 references that were found in the database after a search were reduced to 62. After that, the whole texts were examined to ensure that the documents matched the criteria for selection (see Table 2). At this point, 41 papers were discarded: 26 did not address topics pertinent to this investigation, and 15 were qualitative interview studies without data extracts. There were still 21 papers. Then, 1 document was found after conducting backward and forward reference searches. The quality of a total of 22 papers was then evaluated.

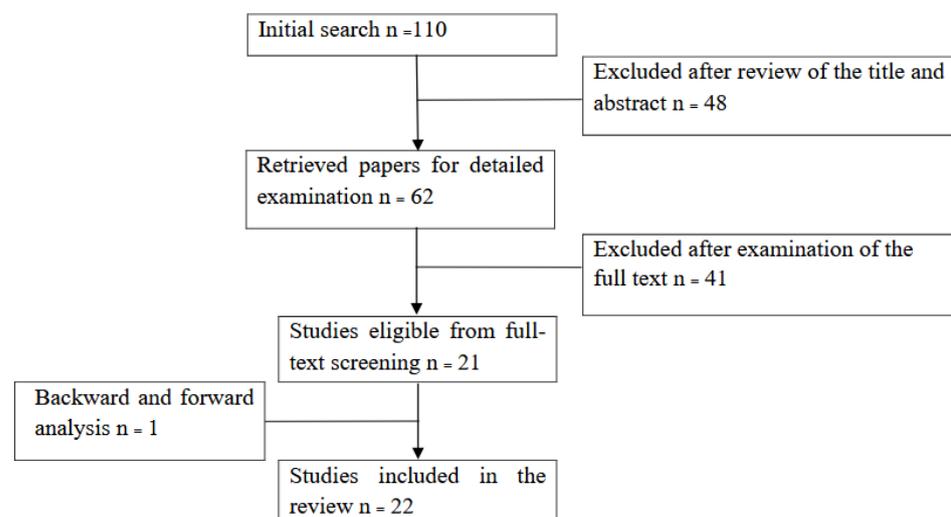


Figure 1. Process flow diagram for finding literature.

4.2.3. Evaluation of Quality

According to Tondeur [30], the Critical Appraisal Skills Program's [31] checklist was modified and served as the foundation for the quality assessment. Contextual information, such as the location of the research, was also considered when evaluating the quality. There were differences in the quality of the research papers, as several other meta-ethnographers have noted. Researchers are urged to employ more inclusive rather than exclusive quality rating frameworks due to the interpretive character of meta-ethnography [32]. As a result, papers without certain methodological components or without a specific study goal were seen to contribute to the synthesis using first-order constructs (see Table 3).

Table 3. Evaluation of Quality [30].

| Evaluation Question | Yes | Moderately | No |
|---|-----|------------|----|
| 1. Is the research qualitative? | 9 | 0 | 0 |
| 2. Are the research questions well-written? | 5 | 2 | 2 |
| 3. Is the qualitative method well-supported? | 6 | 3 | 0 |
| 4. Does the approach address the issues raised by the researcher? | 6 | 2 | 1 |
| 5. Is the study context explicitly stated? | 4 | 2 | 3 |
| 6. Has the link between participants and researcher been properly considered? | 2 | 1 | 6 |
| 7. Is the sampling method thoroughly explained? | 7 | 2 | 0 |
| 8. Is the method of data collection sufficiently described? | 5 | 2 | 2 |
| 9. Is the method of data collection appropriate for the questions? | 6 | 1 | 1 |
| 10. Is the description of the analysis procedure clear? | 2 | 6 | 1 |
| 11. Are the claims supported by sufficient evidence? | 7 | 1 | 1 |

4.2.4. Read the Studies and Ascertain Their Relationships in Steps 4 and 5

To identify and characterize the essential concepts, this stage paid great attention to detail and involved reading and rereading the research [27] (p. 28).

4.2.5. Translate Studies into One Another in Steps 6 and 7, then Combine the Translations

The themes from paper 1 were paired with those from paper 2, and so on, in the translation phase. The papers were then organised chronologically. This procedure was repeated until all 22 trials had been compared.

Table 4 Highlights the major ideas that emerged during the synthesis. In order to pinpoint the contextual elements influencing teacher perceptions, notes on contextual remarks were reviewed. This technique divides contextual elements into macro- and microcategories. Microcontexts pertain to the level of the individual, whereas macrocontexts refer to significant national and international trends, customs, and policies.

Table 4. Key ideas found in each study.

| Study | Perceptions of Teachers | | | | | | | | | |
|-------------|---|---------------------------------------|-----------------------|--|--|---|-----------------------------------|--|--|--|
| | Positive | | | | Negative | | | | | |
| | Tech Is Beneficial for Academic Performance | Tech Is Beneficial for Generic Skills | Tech Centered Beliefs | Tech Is Beneficial for Socioemotional Skills | Tech Integration as a Societal Preparation | Tech Offers Opportunities for Metacognition and Creative Dvt. | Lack of Sufficient Digital Skills | Experienced Teachers Reluctant to Use Technology | Traditional Methods Are More Effective than Digital Ones | Technology Consumes and Wastes More Time |
| Aminu | | | × | | | × | | | × | |
| Ashrafzadeh | × | | | | × | | | | | × |
| Birgin | × | | | | | | | × | | |
| ChanLin | | | | × | × | | | | | |
| Faizi | | × | | | | | | | × | |
| Ghavifekr | × | | × | | | | | | | |
| Domingo | | | | | | | × | | | |
| Hatman | × | | | | × | | | | | × |
| Jones | | × | | | | | | × | | |
| Lai | × | | | | × | | | | | |
| Lauricella | | | | | | | | | × | |
| Mertala | | | | × | | × | | | | |
| Munyengabe | × | | | × | | | | | | |
| Mwendw | | × | | | | | | | | × |
| Serin | × | | | × | | | | | × | |
| Salleh | × | | | × | | | | | | |
| Stein | | × | | | | | | | | × |
| Tang | × | | | | × | | | | | |
| Tondeur | | × | | | | | | | | |
| Zehra | × | | | | × | | | | × | |

5. Results

Three major sections comprise the presentation of the review's findings. The general characteristics of the papers under examination are covered in the first section. The teacher's positive and negative opinions are covered in the second section, and the third section focuses on the contextual elements that affect teacher perceptions.

5.1. Characteristics of the Studies

In the papers that were reviewed, the central issue of teachers' perspectives was found, and 22 studies had related ideas (see Table 5).

Table 5. Background information about the reviewed papers.

| | |
|---|---|
| Year of Publication ^a | 2015 (4), 2016 (2), 2017 (5), 2018 (2), 2019 (4), 2020(2), 2021 (2) |
| Study context includes: | Asia (12), Europe (5), Africa (2), North America (2) |
| Respondents: | In-service teachers, pre-service teachers, university instructors |
| Data collection methods: | Interview, classroom observations, focused group discussion, Meta-ethnography, Meta-aggregative open-ended questions, questionnaire tools, semi-structured method, and descriptive case studies |

^a Some of the reviewed papers were published as advanced online publications rather than in a volume at that time. These papers were assigned dates based on the year they were first published online.

5.2. Teacher Perceptions

There were 22 papers with subjects linked to teacher perceptions, which were further separated into two primary categories: (1) teachers' positive perceptions and (2) teachers' negative perceptions.

5.2.1. Teachers' Positive Perceptions

In total, 20 papers were used to identify teachers' favorable attitudes. The majority of teachers believed that the use of technology in the classroom could improve students' academic performance, according to 10 papers [33–39]. Teachers believe that ICT integration will improve students' subject-related knowledge and skills, particularly in science courses, was a recurring topic in the aforementioned publications.

Four papers [40–42] also explained their opinions on how using technology could assist students to develop their general learning capacities, which are crucial for successful learning [43]. Although the majority of teachers' positive perceptions concentrated on academic advantages, some teachers thought that ICT integration might assist the growth of social and emotional abilities. Four studies expressed this opinion [42,44].

One common justification for teachers' positive perception is that technology-facilitated learning is more effective than the use of traditional and ready-made materials, and the advantage of technology use are supported by learners' increased motivation and engagement [38,40]. This is true regardless of the perceived benefit, whether it can relate to academic, socioemotional, subject-based, or general learning skills.

Technology centeredness represents ideologies that hold that technology can engage students on its own. This category yielded one theme, which was the merits of digital use [28,38]. Because the dynamic affordance was believed to better catch learners' thoughts than still visuals, digital use was shown to be superior to traditional forms of representation. The use of digital tools in the classroom encourages communication and cooperation between teachers, students, and key technology users, as well as the professional development of practitioners [28]. Students are empowered when digital tools are used in the classroom properly and effectively since they now have a voice they did not have previously [43]. This shows that utilizing ICT tools changes the way in which students and teachers interact during learning and opens up new possibilities for different types of social interactions.

The goal of incorporating technology into classroom learning is to prepare students for a changing society [28,41,45,46]. Giving students the knowledge and skills required

for full civic engagement is one of the key objectives of technology-enhanced classroom learning because society is heavily digitalized. As stated by a teacher in the field:

“I think it is preferable that ICT to be taught from elementary school level through university because online services have become part of daily life and knowing how to use them is becoming an increasingly crucial civic skill”. [46]

Some teachers think the secret to successful ICT integration is using technology to communicate with people around the world [28]. Technology is seen to have a significant role in helping students become citizens in societies that embrace cultural variety [47]. Last but not least, ICT integration is considered as having a positive effect given that not all students have equal access to computers at home [41].

ICT integration, according to teachers, enhances students' learning and play experiences while also presenting opportunities for metacognition and creative growth [48]. The ability of students to study independently, their self-esteem, and their fine and gross motor skills all improve when ICT is used in the classroom.

5.2.2. Teachers' Negative Perceptions

Despite the significant number of references to teachers' favorable opinions, not all teachers were impressed by technology's teaching-related advantages. Some teachers lack the necessary digital proficiency to effectively search for, compile, communicate, collaborate, and create their digital content [38,49]. Teachers are ill-prepared to deal with issues like cyberbullying, careless use of personal information, or information skepticism [38]. A potential issue with integrating technology into the educational setting is technophobia.

Some experienced teachers are typically more resistant to utilizing technology [28,34]. There are a number of reasons why teachers are reluctant to adopt technology, including their anxiety about using it, a sense of losing control over the teaching environment, the availability of hardware and software, a lack of technical support, time and effort required for training and remaining up-to-date in their fields, and the use of the right technology in the classroom. Young teachers, on the other hand, participate more actively in workshops and are more receptive to novel approaches. More capable and competent teachers utilize ICT more regularly and with a more favorable attitude [50].

The fact that traditional methods offer tactile experiences and enable students to take a more active role in their learning is another reason why some teachers believe they are more active than digital ones [34,37,48]. Digital technologies, according to one teacher, offer passive activities that kill students' creativity [51].

Finally, teachers believe that using technology in the classroom requires more time and effort from them than using traditional methods. In addition to the loss of privacy and personal control brought on by constant access to ICT, they emphasize how much time is spent on technology [37,47,51].

5.3. Contextual Factors Shaping Teachers Perceptions

The second research question looked into how teachers' opinions of ICT integration in the classroom were influenced by contextual circumstances. Teachers' experiences and their local settings, such as their training and school pedagogical culture, are the two primary categories of contextual factors that affect teachers' perspectives. Global educational trends, such as pro-technology and pro-education policy, fall into the second category.

5.3.1. National Policies and Pro-Technology Zeitgeist Are Two Global Trends in Education

The pro-technology zeitgeist, which refers to innate positivism that has become an all-pervasive aspect of discourse around education technology use on a global scale, is the most pervasive contextual influence [52]. ICT equipment for schools has been recommended by international stakeholders including the Organization for Economic Cooperation and Development [36,49]. These suggestions have influenced national policies. One study [2] claims that Rwanda's successive governments have promoted an ideology that supports the “One Laptop Per Child Program” for education. From the teachers' standpoint, which

was extremely positive, this policy was recognized as beneficial. Similar to this, it was noted [45] that schools in Pakistan are spending more on technology as a potential answer to their problems with teaching, which also demonstrates confidence in the benefits of ICT integration.

Second, according to the results of this systematic study, different national policies affect how technology is used in classroom instruction across different nations. As a result, teachers may have varied perspectives on how technology is used in the classroom. As an illustration, in a comparative study [38], participants from Finland associated technology with educational change, while those from Turkey [40] did not. The authors hypothesized that this disparity in perception might be caused by the fact that in Finland educational tools are valued as a way to transmit 21st century technological capabilities. Chinese culture and communist ideology, which value unity, order, collectivism, and control, have led Chinese teachers to believe that technology should be used for whole-class activities [36].

5.3.2. Teachers' Immediate Environment: Training, Pedagogical Culture of the School, and Teachers' Experiences

According to studies [28], teachers who took part in various in-service training sessions had varying viewpoints on what constitutes pedagogically suitable ICT integration, and their perceptions were in line with the training's themes. It was said that teachers' opinions on the proper integration of technology would have been different if schools had employed technology facilitators [33]. Numerous studies generally addressed the issue of inadequate pre-service and in-service training [34].

The pedagogical culture of the school may influence teachers' attitudes toward the types and frequency of technology use in the classroom. In one study, a teacher taught her students how to log out of online sites and discussed what information was appropriate to share with them. She also applied the school slogan, "Be safe, be kind, be responsible" to online behaviour. It was shown that teachers were more willing to adopt technological practices when there was a school motto on the campus [28].

The usage of technology by students outside of the classroom was observed by teachers. This entailed keeping an eye on one's own students, as well as occasionally other students [36,42,48]. Teachers concluded from these findings that students use technology heavily at home and engage more fully in technology-mediated practices than in traditional ones.

5.3.3. In-Text Reference to the Model

As a concluding step of the review technique, the results of the second research question, which focused on the contextual elements that affect teacher perceptions, were presented in a model (see Figure 2). The findings were organised into two aggregation levels: Firstly, global education trends, which consisted of national policies and a pro-technology zeitgeist. Secondly, teachers' immediate environment, which comprised teachers' experience, school pedagogical culture, and training.

From the evidence, it was clear that the international stakeholders, including the Organization for Economic Cooperation and Development, emphasized that the use of technology in education at school level was important. Their emphasis has influenced different countries to establish national policies for integrating ICT equipment for schools in classroom instructions, e.g., the Rwandan government promoted an ideology that supports the "One Laptop Per Child Program" for education. In addition, it was said that teachers' opinions on the proper integration of technology would have been different if schools had employed technology facilitators. Lastly, it was shown that teachers were more willing to adopt technological practices when there was a school motto on the campus. Next section is a discussion on this perspective of the presented model synthesized from the contextual factors shaping teacher perceptions.

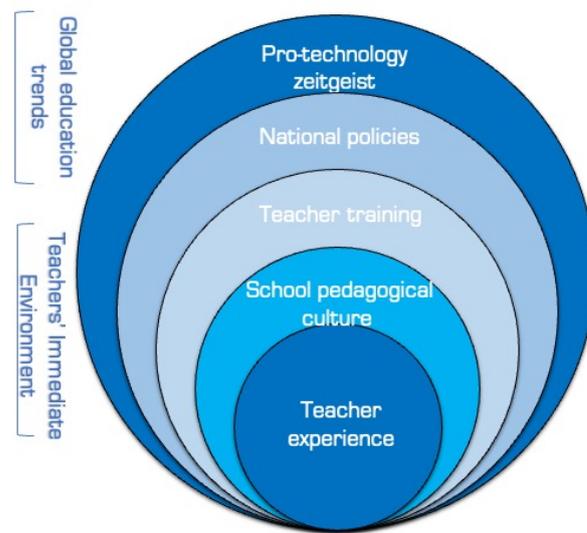


Figure 2. Contextual factors shaping teacher perceptions.

6. Discussion

In this paper, 22 qualitative empirical research studies were reviewed via meta-ethnography to provide answers to the following two questions: (1) How do teachers perceive, both positively and negatively about integration technology in the classroom? (2) What contextual elements/factors influence teacher perceptions on using technology in the classroom?

Regarding the first research question, this review has demonstrated that positive and negative perceptions play meaningful roles in teacher perceptions of technology use in classroom instructions. Each of these uses and dimensions were identified from teacher perceptions for or against integrating technology into classroom instruction. For instance, the use of digital devices and software was believed to be either beneficial or adverse for learning. The dual positive and negative responses used as the conceptual framework in this review have both refined and made more complex the rather narrow way in which teacher perceptions have been approached in previous research. There was also subtle empirical evidence that an individual teacher can perceive that technology use can have both pros and cons for classroom instructions [28].

Regarding the second research question, the results show that teacher perceptions are shaped by the broader cultural sphere. This contains the global pro-technology zeitgeist and national policies. It also includes teachers' immediate environment, including training, the school pedagogical culture, and teachers' experiences.

Moreover, the findings of this review challenge the prevailing dichotomic view in which young pre-service teachers are portrayed as "digital-native teachers" who can ride the wave of potential pedagogical affordances of new technologies, whereas their older in-service co-workers are represented as disempowered and anxious about the use of such technology [49]. However, the findings of this review suggest that both of these groups share similar hopes and anxieties with regards to ICT integration into classroom instruction.

6.1. The Significance of Programs for Teachers' Professional Development

Teachers' professional development programs are important to train, support, and provide up-to-date technological skills required for pre-service and in-service teachers [23]. These programs must act as catalysts or sources for transforming teachers' minds by making sure that the use of technology in classroom teaching is compulsory. Key themes indicated that technology is important in classroom teaching, including academic performance, generic skills, socioemotional skills, societal preparation and metacognition, and creative development. These key themes showed that the effective integration of technology use in classroom teaching was promising if planning and strategies were set and implemented in

the school curriculum [35]. To implement such a plan, the development of a technology that incorporates the vision and strategic direction of the entire teacher education program is crucial [51]

Furthermore, teachers' professional development programs are perceived as tools for improving teachers' knowledge and skills in the use of information and communication technology in the classroom [53]. The use of ICT in classroom teaching could be successful if schools support and provide up-to-date infrastructure and adequate professional development, as well as support staff during its application [42]. Teachers must be competent in the integration of technology and have a broad understanding of the curricular, technological, financial, social, and administrative dimensions of ICT use in classroom teaching.

The lack of professional development was addressed in various papers [54]. It is suggested that teacher training is not provided systematically. In this case, training for in-service teachers concentrates on using technology as a tool for teaching subject content. Further research suggests that if schools had hired technology facilitators or digital media consultants, their input might have been reflected in teachers' beliefs about appropriate ICT integration [42]. Having a variety of pedagogically problematic perceptions, the results in this review challenge the adequacy of subject content training. As perceptions are difficult to change [55], it is crucial to critically evaluate the pedagogical appropriateness of teacher perceptions during initial and continuing training.

Based on the findings of this review, teachers' positive perceptions should be critically reflected upon. In many cases, teachers' examples of good technology-mediated teaching meant engaging learners with software presentations without the students being aware of the learning goals. These methods represent students as passive beneficiaries, which contradicts the current scientific understanding of how learners engage in learning [56].

Perceptions against ICT integration should also critically be reflected on in initial and continuing training. For example, empirical research has shown that teachers resist change due to training deficiency, self-esteem, and frustrations [41], but no solutions have been proposed to overcome these challenges. While negative perceptions must be addressed, it is important that negative perceptions of ICT integration are not stigmatized as reactionary by default. For example, doubts about the effectiveness of digital learning expressed by several teachers are not unfounded.

As perceptions are shaped by social and cultural conditions [17], changing perceptions cannot be approached only by changing individual teachers' thinking but must be approached by changing the professional group perceptions. Therefore, it is important that teachers working in the same school regularly discuss and critically reflect on their perceptions and values regarding technology use in the classroom and generate a shared vision for ICT integration. This point is also crucial from the viewpoint of pre-service teachers' learning as they are found to assimilate with the technology pedagogical culture of their teaching practicum placements [37].

6.2. Limitations of the Study and Recommendations for Future Research

This study used a meta-ethnography approach to synthesize qualitative evidence on teacher perceptions about ICT integration into classroom instruction. The first limitation is that a systematic review is time-consuming, although meta-ethnography provided rich information that has been interpreted across the selected studies to cover the levels of interpretation based on the data from all 22 studies. Second, a high number of selected studies had titles which interested the researchers, and some of the reviewed studies concentrated only on teacher perceptions of the advantages of technology practice [36,41]. Thus, a high number of positive perceptions does not necessarily mean that the majority of teachers have such beliefs but that they are presently the most studied topic. When a situation produces differing perceptions, the perception with the higher-ranked importance overrides the others [19].

Furthermore, most of the reviewed studies were conducted in Asian contexts, including China, Pakistan, Iran, India, Chinese Taiwan, Iraq, United Arab Emirates, and Malaysia.

It is important for future researchers to study why this geographic area has published many journals and articles related to teacher perceptions of the use of technology compared to other parts of the world.

In addition, a remarkable number of significant and high-quality studies published in languages other than English were ignored in this review. It is recommended that forthcoming research considers publications written in languages other than English and brings the results of these research studies to the attention of the international scientific community. Such evidence would be greatly appreciated for a better understanding of the contextual differences and similarities taking place in the international field of education. This objective will be achievable through systematic worldwide cooperation.

7. Conclusions

In this meta-ethnography, published qualitative studies exploring teacher perceptions of ICT integration into classroom instructions were screened, analyzed, coded, and interpreted. A variety of issues and interventions were explored to obtain more insight into teacher perceptions of the use of technology in classroom instruction. The results of the meta-ethnography from research question number one yielded ten themes: six related to teachers' positive perceptions and four to teachers' negative perceptions about technology use in classroom instruction. The results from research question number two yielded two themes: global trends (pro-technology zeitgeist and national policies) and teachers' immediate environment (training, school pedagogical culture, and teachers' experience). An overarching model was developed to clarify how global trends and teachers' immediate environment influence technology use in classroom instruction.

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