Unleashing the Potential: A Systematic Review of Teachers' Perspectives on Enhancing Teaching Practices through Digital Tools

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Abstract

The use of digital tools in education has become increasingly prevalent in recent years. This systematic literature review explored teachers' perspectives on the use of digital tools in the classroom, with a focus on the potential advantages and challenges of using technology in their teaching methods. The review found that teachers are aware of the potential benefits of using digital tools, such as the ability to provide dynamic and engaging material, personalized learning experiences, collaboration opportunities, and access to a plethora of resources. However, teachers also face a number of challenges when trying to use digital technologies effectively, such as lack of training, technical difficulties, and concerns about student engagement. The review concludes that there is a need for educational institutions and governments to make investments in providing sufficient resources, infrastructure, and training to assist instructors in incorporating digital technologies into their classes. Additionally, teachers can be inspired to share best practices and gain knowledge from one another's experiences by fostering a friendly and cooperative digital culture within their schools. Ultimately, fostering an inclusive and productive digital learning environment requires considering teachers' viewpoints on the use of digital resources. By resolving the issues and taking advantage of the opportunities, educators may fully harness the full potential of digital resources to improve their teaching practices and provide students with engaging and impactful learning experiences.

Keywords: Benefits, Challenges, Digital Tools, Teaching Practices, Teachers' Perception

Introduction

In the digital age, students are growing up in a world surrounded by technology, making it crucial for educators to adapt their teaching methods to meet the needs of digital natives. Technology has already permeated every aspect of human life. To improve the direction of teaching and learning processes in the three educational domains, new educational ideas have emerged because of ICT advancements (Abubakar & Muhammed, 2023). They stated that the Internet serves as the primary access point for social media and browsing. They also

stated that the Internet, which is available around-the-clock, is today lecturers' and students' primary source of essential knowledge. Therefore, teachers should accommodate due to the demand of the ICT generation.

Not only that, the internet and the spread of technology are undoubtedly extremely major and quick sources of inspiration for the education sector. Nowadays, classrooms are no longer the sole venues for pupils to learn and gain knowledge. Instead, the internet offers a wealth of options for learning information and accessing it from anywhere, including more readily available web-based educational materials (Jena & Barman, 2018). The 21st century necessitates innovation in the learning process since access to knowledge is not just limited by classroom boundaries but also through laptops and cellphones (Wahyudi, 2019).

According to Portz et al (2019), many nations have adopted new technology to improve the entire educational process. However, the lack of knowledge among instructors regarding the use of digital tools in the classroom (Ovcharuk et al., 2022) is one of the major problems confronting education today. In light of this, the purpose of this study was to examine teachers' perspectives on the benefits of incorporating Information and Communication Technology (ICT) into their teaching-learning practices as well as their readiness, attitudes, and barriers to doing so. By understanding teachers' opinions and experiences, the results of this systematic literature study will enable them to understand of how digital tools are used and overcome possible obstacles to effectively use digital tools in their teaching practices.

Literature Review
Digital Tools Integration in Education
The advantages of integrating digital tools for instructors in education have been emphasized in several research. Yordming (2017) stated that with the use of digital technologies, teachers may differentiate learning activities based on the needs, interests, and skills of each individual student. Additionally, they give users access to a wide variety of resources such as interactive learning tools, allowing teachers to improve their lessons and involve their students more actively (Dalby & Swan, 2019).

Not only that, learning and teaching English are becoming more varied and diversified due the vast digital resources such as Google Classroom, social media, and other digital platforms (Sudlow, 2018). Tai & Omar (2017) emphasizes that utilizing various teaching methods might increase students' enthusiasm and interest in their studies. Utilizing the tools, they are accustomed to in the teaching and learning process helps pique the students' interest. Hence, students may be engaged and get valuable lessons by using digital learning, which can create a fun and fascinating learning environment.

Furthermore, digital tools also provide the possibility of successful communication between teachers and students (Deneen et al., 2018). Effective and efficient formative assessments are a fundamental component of learning. Using a technological tool to offer formative assessment in an online classroom has significant benefits as it makes the learning more engaging and enables students to receive tailored, individualized feedback (Luthfiyyah et al., 2021). The usage of technology presents a chance for data analytics in addition to providing quick and detailed feedback. According to Chong (2018), prompt feedback might encourage students to use their autonomy and metacognition while learning. He also asserted that prompt formative assessment can also help teachers reflect on their pedagogical expertise to improve the quality of their instruction.

Teacher Competencies in Education 4.0 (TCEdu 4.0)

The expansion of the economy and the development of human capital are significantly influenced by education. In response to the Fourth Industry Revolution (FIR), Education 4.0 has been created to guarantee that the educational ecosystem continually remains dynamic and relevant (Tai & Omar, 2019). Ministry of Education (2016) asserted that schools, which are the centre of education, serve a variety of crucial roles, particularly in educating the next generation for the workforce and for the needs of a constantly changing global environment. As a result, there has been an increasing demand for skilled teachers since they play a key role in determining students' academic success (Harris et al., 2018). However, Zhang et al (2020) mentioned that the main worry is whether instructors can engage in effective teaching and learning that may have a good influence on students' learning considering the obstacles in education 4.0 globally.

The Malaysia Education Blueprint 2013–2025 was developed to improve the educational system efficiently and sustainably and to educate young Malaysians to compete and prosper internationally (Nusrah & Chan, 2020). Ministry of Education (2013) asserted that the effort to "Transform teaching into the profession of choice" is one of the 11 operational changes designed to achieve the Blueprint's educational objectives. Subsequently, large sums of money were then provided by the government to this endeavour to explicitly improve teacher competency through a variety of policies and programmes for professional development for teachers that have the ability to reframe instruction to better suit the requirements of students (Tai & Omar, 2018). In light of the foregoing, TCEdu4.0 makes reference to a variety of competences that allow teachers to carry out teaching and learning practises successfully in order to meet the expectations and difficulties of FIR. Tan et al (2022) highlight that teachers who possess these skills can improve students' learning results and encourage their ingenuity and inventiveness as they must be technologically knowledgeable and understand that change is inevitable but not always a bad thing; it might even be progressive and beneficial (Panagiotopoulos & Karanikola, 2020).

Research Objectives and Research Questions

This systematic review aims to present a synthesis of empirical evidence found in the past related studies on the utilization of digital tools to enhance teachers' teaching practices so that further intervention development and research in this area can be conducted. The purpose of the study is to answer the following questions:

1. What are the teachers' perceptions in utilizing digital tools in their teaching practices?
2. What are the challenges of digital tool integration on the teachers' teaching practices?

Methodology

This systematic analysis' main goal was to provide a concise overview of representative literature that dealt with teachers' perception and experiences as they incorporated ICT and digital tools into their teaching-learning practices. This systematic literature review adheres to the PRISMA technique, which consists of three phases: identification, screening, and included. PRISMA acts as a reporting guideline to assist researchers in choosing, evaluating, and synthesising the papers evaluated (Khan & Qureshi, 2020).

Furthermore, to increase the transparency of the findings, each step of the systematic review was explained precisely. The figure 1 below demonstrated how the papers were found and added in a clear manner to provide a systematic review that is helpful to other users.
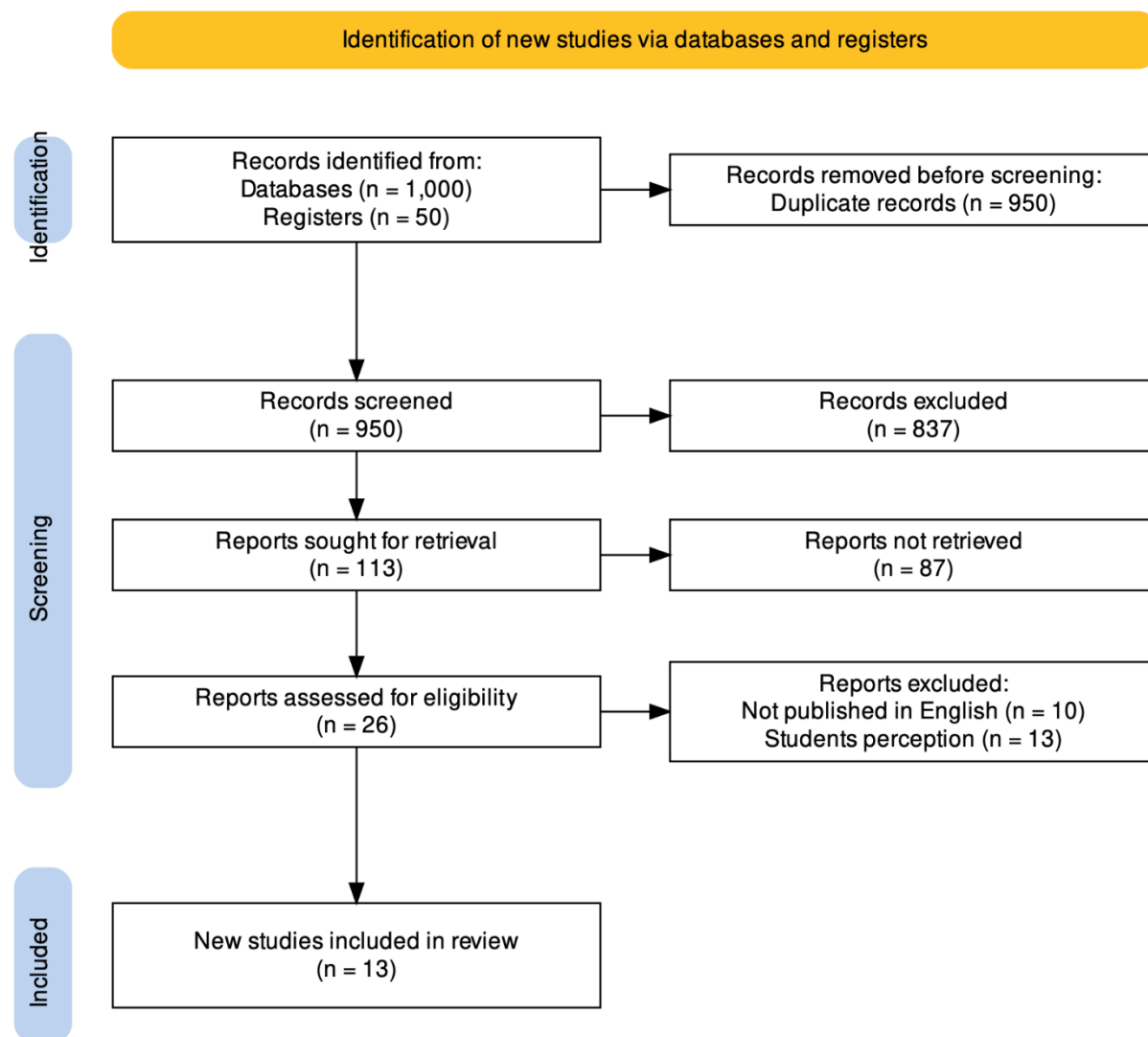

Figure 1 Prisma 2009 Flow Diagram

Phase 1: Identification

Identification is the first stage of the systematic review, as specified in the PRISMA standards. Accordingly, the researchers have chosen two main databases, namely ERIC and ScienceDirect. To identify the pertinent research connected to the use of digital technologies in the teaching and learning of English for sustainable education, discrete keywords were created for this systematic review. Table 1 shows the search string used in this investigation for each database.

Search string
Table 1 Search String used for each database

Database	Search String
ERIC	TITLE-ABS-KEY (("English teacher" OR "EFL" OR "ESL" OR "English language learning") AND ("Digital tool*" OR "digital technology" OR "educational technology" OR "Technology" OR "technology integration" OR "flipped classroom" OR "Edmodo" OR "Youtube"))
ScienceDirect	TITLE-ABS-KEY (("English teacher" OR "EFL" OR "ESL" OR "English language learning") AND ("Digital tool*" OR "digital technology" OR "educational technology" OR "Technology" OR "technology integration" OR "flipped classroom" OR "Edmodo" OR "Youtube"))

Phase 2: Screening

Possibly pertinent articles using the created search parameters and eliminated duplicates discovered across these two databases. Therefore, 950 duplicate articles were removed, 113 were flagged as ineligible by the automated tools and could not be downloaded, and the remaining articles were evaluated using the inclusion and exclusion criteria listed in Table 2 to determine eligibility.

Table 2
Inclusion and exclusion criteria

Criterion	Inclusion	Exclusion
Type of articles	Journal articles	Book, book chapter, systematic review, proceedings
Publication year	2019-2023 (5 years timespan)	Before 2019
Language	English	Non-English
Content	Related to digital tools and teaching and learning of English	Non-related to digital tools and teaching and learning of English
Methodology	Qualitative, quantitative or mixed-method	Did not use qualitative, quantitative or mixed-method
Perspective	Teachers	Students, lecturers

Phase 3: Included

Following the screening procedure, 13 articles were chosen to be included in this systematic literature review. The chosen studies' objectives were all concerned with the usage of digital technologies in the field of teaching-learning process from the viewpoints of the teachers. The results of the findings will be listed and thoughtfully discussed in the parts that follow.

Results
Chart 1 below shows the summary of the number of research articles that addressed different teachers' perception towards digital tools utilization in the teaching-learning process.

RQ1: What are the teachers' perceptions in utilizing digital tools in their teaching practices?

Table 3
Teachers' Perception in utilizing digital tools

Teachers' perception in using digital tools			
Authors	Positive perception	Negative perception	Positive & Negative Perception
Karsenti et al (2020)			/
Jannah et al (2020)	/		
Erdemir & Eksi–Yangin (2019)	/		
Demirkan (2019)	/		
Luthfiyyah et al (2021)	/		
Zhorova et al (2022)	/		
Singh (2019)		/	
Karamifar et al (2019)		/	
Cheung (2023)	/		
Katemba (2019)	/		
Lawrence et al (2020)	/		
Pratama et al (2020)	/		
Beardsley et al (2021)			/

Subsequently, chart 2 below shows the summary of the number of research articles that addressed different challenges of digital tool integration on the teachers' teaching practices.

RQ2: What are the challenges of digital tools integration on the teachers' teaching practices?
Table 4 Challenges of digital tools integration on the teachers' teaching practices

Authors	Professional Development	Sociocultural context	Limited resources	Competency
Karsenti et al (2020)	/	/		/
Jannah et al (2020)				
Erdemir & Eksi (2019)	/			
Demirkan (2019)	/			
Luthfiyyah et al (2021)				
Zhorova et al. (2022)				
Singh (2019)	/	/	/	
Karamifar et al (2019)	/	/	/	/
Cheung (2023)				
Katemba (2019)	/		/	/
Lawrence et al (2020)	/		/	/
Pratama et al (2020)				
Beardsley et al (2020)	/	/		/

Discussion
RQ1: What are the teachers' perceptions in utilizing digital tools in their teaching practices?

The findings from the articles reviewed offer insightful information on how teachers feel about these technologies, revealing both favourable and unfavourable viewpoints that demand critical analysis and consideration. Based on the reviewed study, 2 themes were identified.

Enhancing learning experiences
The use of digital technologies to improve students' learning experiences has revolutionized the area of education. Numerous advantages that assist and enhance the learning process are offered by these instruments. Digital technologies, in the first place, provide interactive and compelling information that grabs students' attention and encourages active engagement. According to Jannah et al.'s (2020) research of 10 instructors in the Special Region of Yogyakarta, employing digital technology in the classroom was enjoyable and these tools were able to increase their students' learning quality.
Additionally, students can also better understand complicated topics and retain knowledge by using multimedia components such as interactive exercises. According to Luthfiyyah et al (2021) qualitative case study, using online quizzes like Kahoot, Quiziz, and Socrative encourages learning engagement, which may improve students' performance as well as their motivation and concentration throughout the learning.

Enhance Formative Assessment
Assessment is prominent in the teaching and learning process. Simultaneously, the omnipresent of technology use in education facilitates assessment for bettering students' learning. The most notable study was done by Erdemir & Eksi (2019), which revealed a high degree of satisfaction among teachers who used digital tools like Edmodo, with the highest mean particularly expressing a favourable mean at 4.49.
However, according to Luthfiyyah, Aisyah, and Sulistyo's paper from 2021, teachers' views on formative evaluation are still sporadic. They verified that the teachers who took part in their study had inadequate formative assessment understanding since they had not been exposed

to formative assessment procedures. Summative evaluation was more often used among the teachers in their study than formative assessment. Although the teachers concurred that digital technologies are generally helpful for them, they highlighted how it would be even more benefit if the drawbacks could be resolved.

RQ2: What are the challenges of digital tool integration on the teachers' teaching practices?

Teachers' Competency

The research implies that pedagogical ideas are essential for comprehending the many ways that teachers integrate digital technology, and multiple empirical studies have supported this conclusion (Cheung, 2023). According to a study conducted by Beardsley et al (2021) on 17 teachers who took part in the survey research, pedagogical beliefs and pedagogical practices are in line. As a result, those who hold constructivist teaching beliefs were more likely to implement a student-centered curriculum, regardless of any administrative or technical difficulties they might encounter.

However, pedagogical beliefs are also directly related to one's ability and confidence to incorporate digital technology. According to Cheung's (2023) single case about an English teacher in Hong Kong who used Zoom to conduct lessons during the pandemic, the participant's level of technology integration remained at the SAMR model's Substitution level because she struggled to check students' understanding when using Zoom. From the study, it was concluded that the English teacher delivered her lesson in using the same material specifically PowerPoint presentation and Microsoft Word files. Her lack of proficiency in implementing modern technology had a detrimental effect on her pedagogy, which was characterized by her aim to strictly adhere to the curriculum and her reluctance to generate possibilities that were beneficial to student interaction and engagement. Therefore, since creating activities based on students' comprehension is a need for moving up the technology integration continuum, it would be difficult for teachers to go to higher levels if they already had problems at the lowest level (Cheung, 2023).

Professional Development

Professional development continues to be one of the most important factors in enhancing teachers' competence and confidence in the use of digital technologies. Inadequate and inappropriate technology training, whether during teacher education or in-service professional development, may discourage teachers from fully exploring the affordances of digital technologies and meaningfully integrating them in their classrooms (Zhorova et al., 2022).

The truth is that there is a severe paucity of digital learning possibilities for many teachers worldwide, in both developed and developing nations. 30 language teachers from a rural area of Indonesia were polled via questionnaires and interviews to learn more about their perceptions of and difficulties integrating digital technologies into language classrooms. According to Katemba (2019), this research revealed that the participants felt unprepared to integrate ICT into their practices because of the insufficient and inconsistent nature of the technology-related training they had received. Regarding resource accessibility, this has significant ramifications. If teachers don't know how to utilize digital tools or just use them in very basic ways rather than as a pedagogically transforming practise, their expenditures in such facilities may have been wasted (Pratama et al., 2020).

It is significant to note that Cheung's (2023) single case study suggests that one justification for a need for practical training may come from one's own teaching situation. People who have a lot on their plates can be less inclined to look for professional learning opportunities and would rather study things that can be applied right away. This explains why the participant in Cheung's (2023) study tended to choose an all-in-one user menu while learning how to teach well with ZOOM rather than searching for online instructions from other sources.

However, Karamifar et al.'s (2019) large-scale study on 250 English teachers in 30 countries produced conflicting results, with the most well-represented nations being the UK, France, Brazil, Armenia, and Canada. The participants in the study were satisfied with their training in terms of delivery method, instructors, and self-empowerment, according to the researchers, who used an online questionnaire to examine the similarities and differences in continuing professional development needs across various countries and shared their findings via national and international networks.

Limited Resources

One important factor in the adoption of digital technologies (Demirkan, 2019) has been identified as access to resources particularly the availability of digital technology and technical support. The low availability of technical resources and personnel assistance has been noted in several empirical research. Technology access disparity is being recognised as a serious problem (Demirkan, 2019). Some teachers have difficulty to have access to the tools like Edmodo or steady internet connections needed for online learning (Erdemir & Eksi, 2019). This digital gap worsens educational disparities and prevents teachers from fully participating in the teaching process. It should be a priority to work towards bridging this gap through efforts like delivering technological resources or offline access choices (Luthfiyyah et al., 2021).

In addition, research by Karsenti et al (2020) on 100 foreign language instructors revealed that, despite requests for assistance, technical support was sometimes unavailable. This might deter teachers from integrating digital technology into their teaching practices.

Sociocultural Context

The amount of teachers' incorporation of digital technology is heavily influenced by sociocultural variables such as influence from school leaders and colleagues. According to Cheung's (2021) single case study, school leaders are recognized to have a significant influence on teachers' motivation to embrace technology-enhanced practises. Using a variety of study techniques (Lawrence et al., 2020), including surveys, classroom observations, semi-structured interviews with EAP instructors and school administrators across North America, Lawren et al (2020) mentioned that the institution may put pressure on the teachers to accept digital technology and if they don't, the institution may view the teachers as being outdated.

Not only that, the procedures of integrating digital technology may also be hampered by the absence of defined institutional guidelines. Lawrence et al.'s (2020) study confirmed the discrepancy between institutional guidelines and policy direction. A clear vision of technology-enhanced language learning must be displayed by instructors, according to Lawrence et al's (2020) research on participant concerns regarding the guidelines' use of sparse and ambiguous pedagogies to support the integration of digital technologies in the EAP programmes.

Another minor element impeding instructors' incorporation of digital technology is the time constraints brought on by a rigorous academic programme. According to Singh's (2019) interviews with 8 EFL instructors in Nepal on the difficulties in using digital tools, a usual lesson time of 40 or 45 minutes was insufficient. In Singh's (2019) study, the eight participants all agreed that integrating technology into lesson planning may take up too much time and that using digital technologies will restrict their teaching time, especially when there face some technical issues.

In conclusion, there are several hurdles that must be overcome for English language education to be acquired through digital platforms, including technical difficulties, issues with motivation, a lack of knowledge and training, restricted access to technology, and a lack of support. It is necessary to take a complete strategy that incorporates technological assistance, cutting-edge pedagogy, inclusive design, and teacher preparation to overcome these obstacles. An ideal digital learning environment may be made by using this all-encompassing strategy, which will aid in the efficient learning of the English language.

Conclusion & Implications

In conclusion, the major findings of this study are that the adoption of digital tools into teaching practices has the potential to improve teaching strategies and students' learning outcomes. The study reflected varied teachers' perceptions towards the utilization of digital tools in their teaching practices, with some authors such as Karsenti et al (2020); Luthfiyyah et al (2021) illustrating positive perceptions, while Jannah et al (2020); Zhorova et al (2022) reported experiences of both positive and negative perceptions. Furthermore, a survey conducted by Karamifar et al (2019) on 250 English teachers in 30 countries revealed that most teachers were satisfied with their training in terms of delivery method, instructors, and self-empowerment. This evidence supports the usefulness of digital tools in improving teachers' teaching methods and students' learning experiences.

Teachers are aware of the dynamic and engaging material, personalized learning experiences, collaboration opportunities, and access to a plethora of resources that digital technologies can provide. These benefits enable the teachers to actively engage in their own teaching practices, address their students' unique needs and learning preferences and most importantly broaden their knowledge beyond conventional bounds.

It's crucial to recognize, nevertheless, the difficulties educators face when trying to use digital technologies effectively. Hence, the ramifications of this study emphasize the necessity for educational institutions and governments to make investments in offering sufficient resources, infrastructure, and training to assist instructors in incorporating digital technologies into their classes. Programs for professional development should concentrate on both educational approaches and technical abilities to apply digital technologies effectively. Additionally, the fostering of a supportive and collaborative digital culture in schools could help educators to share best practices and gain insights from each other's experiences. This would also further encourage the use of digital tools in teaching, ultimately promoting an inclusive and effective digital environment for educators.

References

Abubakar, H., & Muhammed, H. B. (2023). A systematic literature review on teaching teachers pedagogy through YouTube video technology. *Journal of Digital Educational Technology*, *3*(1), ep2301. https://doi.org/10.30935/jdet/12839

Beardsley, M., Albo, L., Aragon, P., & Hernandez-Leo, D. (2021). Emergency education effects on teacher abilities and motivation to use digital technologies. *British Journal of Educational Technology*, *52*(4). https://doi.org/10.1111/bjet.13101

Cheung, A. (2023). Language Teaching during a Pandemic: A Case Study of Zoom use by a Secondary ESL Teacher in Hong Kong. RELC Journal, Vol. 54(1), 55-70. https://doi.org/10.1177/0033688220981784

Chong, S. W. (2018). Three paradigms of classroom assessment: Implications for written feedback research. *Language Assessment Quarterly,* 15(4), 330-347. https://doi.org/10.1080/15434303.2017.1405423

Dalby, D., & Swan, M. (2019). Using digital technology to enhance formative assessment in mathematics classroom. *British Journal of Educational Technology,* 50(2), 832-845. https://doi.org/10.1111/bjet.12606.

Demirkan, O. (2019). Pre-service Teachers' Views about Digital Teaching Materials. *Educational Policy Analysis and Strategic Research*, *14*(1), 40–60. https://doi.org/10.29329/epasr.2019.186.3

Deneen, C. C., Brown, G. T., & Carless, D. (2018). Students' Conceptions of e-portfolios as assessment and technology. Innovations in Education and Teaching International, 55(4), 487-496. https://doi.org/10.1080/14703297.2017.1281752

Erdemir, N., & Yangın Ekşi, G. (2019). The Perceptions of Student Teachers About Using an Online Learning Environment "Edmodo" in a "Flipped Classroom." *SDU International Journal of Educational Studies*, *6*(2), 174–186. https://doi.org/10.33710/sduijes.638795

Harris, A., Jones, M., & Huffman, J. B. (2018). *Teachers Leading Educational Reform: The Power of Professional Learning Communities*, Routledge, London, UK.

Jannah, M., Prasojo, L. D., & Jerusalem, M. A. (2020). Elementary School Teachers' Perceptions of Digital Technology Based Learning in the 21st Century: Promoting Digital Technology as the Proponent Learning Tools. *Al Ibtida: Jurnal Pendidikan Guru MI*, *7*(1), 1. https://doi.org/10.24235/al.ibtida.snj.v7i1.6088

Jena, A. M., & Barman M. (2018). Synchronous E-Learning Performance in Relations to Thinking Skills, Executive Functions and Attention Benefits of Students. *The Online Journal of Distance Education and e-Learning*, Vol. 6, Issue 3, pg 52-76

Karamifar, B., Germain-Rutherford, A., Heiser, S., Emke, M., Hopkins, J., Ernerst, P., Sticklker, U., & Hampel, R. (2019). Language teachers and their trajectories across technology-enhanced language teaching: Needs and beliefs of ESL/EFL teacher. *TESL Canada Journal*, 36(3), 55-81. https://doi.org/10.18806/tesl.v36i3.1321

Karsenti, T., Poellhuber, B., Roy, N., & Parent, S. (2020). The Impact of COVID-19 on Higher Education and Educational Technology – Part 1. *International Journal of Technologies in Higher Education*, *17*(2), 5–8. https://doi.org/10.18162/ritpu-2020-v17n2-02

Khan, N., & Qureshi, M. I. (2020). A Systematic Literature Review on Online Medical Services in Malaysia. *International Journal of Online and Biomedical Engineering (IJOE)*, *16*(06), 107. https://doi.org/10.3991/ijoe.v16i06.13573

Lawrence, G., Ahmed, F., Cole, C., & Johnston, K. P. (2020). Not more technology but more effective technology: Examining the state of technology integration in EAP programmes. RELC Journal, 51(1), 101-116. https://doi.org/10.1177/0033688220907199

Ministry of Education Malaysia. (2013). *Malaysia Education Blueprint 2013-2025*. Ministry of Education Malaysia, Putrajaya, Malaysia.

Ministry of Education Malaysia. (2016). *Malaysia Education Blueprint 2013-2025*. *2016 Annual Report*, Ministry of Education Malaysia, Putrajaya, Malaysia.

Nusrah, A. M., & Chan, Y. F. (2020). The Effects of Perceived Leadership Styles and Emotional Intelligence on Attitude toward Organizational Change among Secondary School Teachers. *Asian Journal of University Education*, 16(2), 36-45. https://doi.org/10.24191/ajue.v16i2.10295

Ovcharuk, O. V., Gurzhii, A. M., Ivaniuk, I. V., Kartashova, L. A., Hrytsenchuk, O. O., Vakaliuk, T. A., & Shyshkina, M. P. (2022). The use of digital tools by secondary school teachers for the implementation of distance learning in the context of digital transformation in Ukraine. *CTE Workshop Proceedings*, *9*, 16–27. https://doi.org/10.55056/cte.96

Panagiotopoulos, G., & Karanikola, Z. (2020). Education 4.0 and Teachers: Challenges, Risks and Benefits. European Scientific Journal, ESJ, Vol. 16, 34. https://doi.org/10.19044/esj.2020.vl6n34p108

Portz, J. D., Bayliss, E. A., Bull, S., Boxer, R. S., Bekelman, D. B., Gleason, K., & Czaja, S. (2019). Using the Technology Acceptance Model to Explore User Experience, Intent to Use, and Use Behavior of a Patient Portal Among Older Adults With Multiple Chronic Conditions: Descriptive Qualitative Study. *Journal of Medical Internet Research*, *21*(4), e11604. https://doi.org/10.2196/11604

Pratama, S. H. H., Arifin, R. A., & Widianingsih, A. W. S. (2020). The Use of Youtube as a Learning Tool in Teaching Listening Skill. *International Journal of Global Operations Research*, *1*(3), 123–129. https://doi.org/10.47194/ijgor.v1i3.50

Singh, R. (2019). Barries of technology intergration in teaching English. *International Journal of Academic Research in Business, Arts and Science*, 1(2), 24-37.

Sudlow, C. (2018). Digital tools in English Language teaching and learning: A case study of Google Classroom. *ELT Journal*, 72(2), 182-192.

Tai, M. K., & Omar, A. K. (2017). Measuring teacher attitudes towards change: An empirical validation. International Journal of Management in Education, 11(4), 437-469. https://doi.org/10.1504/IJMIE.2017.086909

Tai, M. K., & Omar, A. K. (2018). A comparative analysis on principal change leadership competencies in Malaysian high- and mediocre-performing secondary schools. *Asia Pacific Journal of Education*, 1–20. https://doi.org/10.1080/02188791.2018.1476319

Tai, M. K., & Omar, A. K. (2019). School Leaders' Competencies that make a difference in the Era of Education 4.0: A Conceptual Framework. International Journal of Academic Research in Business and Social Sciences, 9(4). https://doi.org/10.6007/ijarbss/v9-i4/5836

Wahyudi, W. D. (2019). The 21st century learning process: A review of Literature. *International Journal of Educational Research.*

Yordming, R. (2017). Teachers' Perspective towards Digital Teaching Tools in Thai EFL Classrooms. *International Journal of Languages, Literature and Linguistics,* 3(2), https://doi.org/10.18178/ijlll.2017.3.2.108

Zhang, S., Shi, Q., & Lin, E. (2020). Professiona Development Needs, Support and Barriers: TALIS US new and veteran teachers' perspective. Professional Development in Education, 46(3), 440 – 453. https://doi.org/10.1080/19415257.2019.1614967

Zhorova, I., Kokhanovska, O., Khudenko, O., Osypova, N., & Kuzminska, O. (2022). Teachers' training for the use of digital tools of the formative assessment in the implementation

of the concept of the New Ukrainian School. *Educational Technology Quarterly*, *2022*(1), 56–72.