Global Social Sciences Review (GSSR)
URL: http://dx.doi.org/10.31703/gssr.2021(VI-I).53

Digital Competence and Mysteries of Learning: Use of Technology in Classrooms

Shahbaz Ahmad * Muhammad Naveed Khalid† Muhammad Anees-ul-Hasnain Shah‡

Abstract *The idea of digital competence has emerged in recent years around the globe. It entails a wide range of abilities and knowledge in every field. The current research paper is to investigate the digital competence and mysteries of learning: use of technology in classrooms by the teachers. University teachers were used as population and sixty teachers were randomly selected as a sam-ple from different campuses of education university Lahore. Self-constructed instrument, Teach-ers' Digital Competencies Survey [TDCS] instrument, was adapted and used for data collection. The results revealed a statistically apparent difference in gender of teachers about different indi-cators of digital competencies and learning with technology. It was concluded that male teachers had used more digital technology with more confidence than that female teachers. The research-ers recommended that digital competence may be promoted among teachers for the better teaching and learning environment. The universities should provide better technological facilities for better learning.*

- DOI: 10.31703/gssr.2021(VI-I).53
- Vol. VI, No. I (Winter 2021)
- Pages: 523 – 530
- p- ISSN: 2520-0348
- e-ISSN: 2616-793X
- ISSN-L: 2520-0348

Key Words: Digital Learning, Technological Competence, Use of Technology

Introduction

The fast advancement of information and communication technology, as well as the internet, has made it easier for 21st-century learners to access and communicate information through media tools. Learning will undoubtedly be affected by this transformation in an age where knowledge spreads so quickly, and the smartphones, internet, laptops, multimedia tools, and tablets are continuously employed. The institutions have the responsibility to impart pupils to use data, understand it, and justify their use of technology. In this digital world, it is unavoidable to reap the benefits of technology in the classroom through needed support and integration of technology (Kaware & Sain, 2015).

Many countries' academic goals include education and school redesigning around the axis of 21st-century skills to prepare pupils for a globalizing world. In this regard, the findings of educational scholars' recommendations show that some countries have organised or are attempting to structure their curricula to include 21st-century abilities. In order to prepare children for a changing environment, digital skills must be included in all grade levels' curricula. The purpose of this research is to determine digital skills in the curricula.

Digital Expertise among Teachers

Digital competence is a multi-faceted, evolving term that encompasses a wide range of topics and evolves quickly as new technologies arise. To be digitally competent nowadays means understanding the media, obtaining information, applying critical thinking to the material accessed, and connecting with others, utilizing a variety of digital applications and tools (Ferrari, 2013). According to European Commission studies (2008), the skills required to achieve digital competence are known as digital literacy. Access to information, storage, and production were offered as essential abilities (ICT) to assist digital literacy. Digital literacy is a phase of digital competence that comprises fundamental ICT abilities. Digital competence refers to the 21st-century abilities

*Assistant Professor, Department of Education, University of Lahore, Sargodha Campus, Punjab, Pakistan.
† Resource Person, Allama Iqbal Open University, Islamabad, Pakistan. Email: naveedscholar@gmail.com
‡ Associate Professor, Department of Education, University of Education Lahore, Dera Ghazi Khan Campus, Punjab, Pakistan.

Citation: Ahmad, S., Khalid, M. N., & Shah, M. A.-u.-H. (2021). Digital Competence and Mysteries of Learning: Use of Technology in Classrooms. *Global Social Sciences Review, VI*(I), 523-530. https://doi.org/10.31703/gssr.2021(VI-I).53

that people should acquire to participate fully in society. The European Union considers eight fundamental competencies for permanent learning (Ala Mutka, 2011). The idea of digital competencies is still evolving, and it encompasses both technological advancements, political hopes, and online information. It entails a wide range of abilities and knowledge in literacy, communication, technology, and information science. Ilomäki, Kantosalo, and Lakkala (2011) define digital competence as well as the technical abilities needed to use digital technologies, their capacity to work meaningfully in a variety of activities for research, education, and everyday life in general, and their ability to critically analyze digital technologies. Education and Digital Competence

The fundamental abilities acquired via formal education in primary and high school are referred to as digital literacy (Perlmutter et al., 2012). In several regions of the world, studies on digital competency in the compulsory education curriculum are being conducted. The digital literacies development is the responsibility of education ministries. The use of ICT skills should be integrated in the curricula (OECD, 2016). Digital competencies are the idea that is interwoven across the curriculum (Hoechsmann & DeWaard, 2015). Many countries have amended their curricula to improve pupils' digital skills in the classroom (Bocconi et al., 2016; OECD, 2016). This metric encompasses both extremely specialized curriculum modifications and larger changes in curriculum disciplines of the school curriculum description. The revisions will emphasize digital competency as well as comprehending the impact of the digital transformation on people and society.

Digital literacy is not a separate topic in Denmark, but abilities like logical thinking and problem-solving are incorporated throughout courses in schools (Berge, 2017). It addresses the development of talents in very young children, starting at the initial stage. Along with reading and numeracy, it focuses on developing digital abilities that may be used in a variety of disciplines and settings in the workplace (Welsh Government, 2015).

Many western nations have direction for teaching skills since schools and instructors are free to decide for themselves. Digital technology and communication are intended to touch all courses and cross-curricular themes under the new national curriculum (Ananiadou & Claro, 2009). Digital technologies have brought about changes in our daily lives as well as obstacles in which the use of technology is unavoidable. As a result, digital literacy has become an integral part of our daily lives, and this set of abilities has quickly risen to become a major area of competence when dealing with various policy-related papers, as well as a clear issue of focus in European policies. It is reasonable to presume that the idea of digital competence has been a policy emphasis due to its future-oriented nature: it encompasses abilities that will be required of a workforce that will operate effectively in a knowledge-intensive society in the future. As a result, when discussing how to encourage the development of such abilities, it's equally critical to consider how to assess digital competence. The current scenario is comparable to that highlighted by Bawden more than 15 years ago, in 2001, when he noted that the literature on digital skills is inconsistent in terms of terminology and underlying principles. These ideas are frequently referred to as 21st-century talents. Furthermore, while digital competence was formerly thought to only apply to computer-related talents, it now encompasses a broader range of knowledge, skills, and attitudes that are heavily influenced by the job market. Digital competence is taking on new dimensions as we move into more complete work circumstances that include open learning spaces, casual learning and working situations, and a greater quantity of interactive technologies. It is becoming more context-specific as well as philosophically intricate. As a result, many digital competency models and frameworks have been developed for various target groups. The fast proliferation of multiple digital competency frameworks, models, and strategies has shifted the emphasis away from measurement and operational interpretations of digital competence and toward definitions, indicators, and indices. Furthermore, one of the most difficult topics to assess when digital competence is considered to comprise essential future skills at a policy level in knowledge-intensive societies is how to assess such future skills, which is one of the most complex topics among the various concepts of digital competence and the frameworks that set out the initial scales for their measurement.

The assessment of digital abilities has proven to be difficult, and existing systems have failed to implement efficient and systematic processes. The aforementioned points highlight the lack of and need for systematic digital competency evaluation methodologies and technologies that may be used in the context of

a specific field of expertise. Several attempts have been made to assess and quantify digital competence, but there is a lack of a comprehensive assessment of the various options, as well as their strengths and drawbacks. Simultaneously, such an overview is required to guide the various policy-level initiatives and research groups tasked with assessing such competence but who are grappling with similar issues: which instruments are less time-consuming, provide sufficient evidence, are based on real-life situations and tasks, and are valid and reliable. The following is a brief overview of various definitions of digital competence and equivalent terms, based on the above statements and the small number of previous literature reviews focusing on the assessment of digital competence in the context of higher education, including the students and academic staff within the sample.

Ala-Mutka presented a visual representation of digital literacies in the context of 21st century skills in the age of knowledge society. Van Laar et al. (2017) coined the term 21st century digital skills, which are necessary for both individuals and companies to stay up with technological advances and build new goods and processes. These abilities, however, go beyond technical annotation and have a wider impact on capacity to operate in a digitally advanced culture than simply knowing how to use specific software. Although technology is the foundation of innovation, it is people who make knowledge-based innovation happen by workforce decisive. 21st century digital skills boost firms' competitiveness and innovation potential in today's fast-changing information economy. The current COVID-19 epidemic has brought attention to the necessity of digital literacy in integrating technology-enhanced learning techniques at all levels of education. In their research study, Zhao et al. (2021) said that people's conceptions of digital competence differ, as evidenced by their self-assessed degree of digital competence.

Most of the research has emphasized the role of digital skills in diverse and online environment (Fulton & McGuinness, 2016). The COVID-19 pandemic, in particular, has heightened society's awareness of the importance of digital tools (Iansiti & Richards, 2020). The differing viewpoints on what people should know and be able to do in order to be properly "digital." Furthermore, in the rapidly evolving technical and networked environment of everyday life, such as education, jobs, civic responsibility, and health, different requirements and demands are developed. There has been a profusion of definitions for digital competence and digital literacy, with numerous terminology and nomenclature being employed. Many studies can be found in the sphere of higher education, which is the topic of this study, that provide useful reviews of the words (Ilomeaki et al. 2011; Spante et al. 2018).

Bawden (2008) explores the understanding, meaning, and context should be at the heart of this, with questions such as who needs them, why they are important, and in what settings they should be used (Bawden, 2001). This also entails using the Internet in a creative and safe manner, as well as comprehending the risks involved with privacy and the legal and ethical implications of global citizenship, which necessitate adhering to online behaviour norms (IFLA, 2017). This trend may also be seen in higher education discussions, where the focus is on addressing the capacities that all university students need to prosper as successful and responsible members of a digital society (Bawden & Robinson, 2002).

The use of technology enhances the cooperation in virtual networks, and leveraging digital technologies to encourage reflection are just a few of the themes highlighted (JISC, 2014). McGuinness and Fulton (2019) also looked at how students developed crucial digital literacy abilities in the classroom using a hybrid learning strategy that included disposable learning items.

In the United Kingdom, for example, JISC has created the "Digital Capability Discovery Tool," which provides an "empowering initial step for staff and students to reflect on their digital capabilities and to identify present strengths and areas for development" (JISC, 2019).

As a result, there is a need to comprehend the diversity of learners, as well as their various digital experiences, practices, and mindsets, in order to better understand how to best assist them in developing into the professionals and citizens of the future: those who are committed to lifelong learning and possess the expected digital behaviours that will enable them to thrive in a rapidly changing online environment. People gain skills and competence in a variety of settings, including "primary, secondary, and university education, training, self-directed learning, and employment or everyday life

experience" (Government Office for Science, 2017). Furthermore, in elementary, secondary, further, and higher education, attention should be paid not just to students' growth but also to educators' development of digital capabilities.

Objectives of the Study

The following were the objectives of the research study:

1. Explore the digital competencies and learning with technology among university teachers.
2. Find out the indicators of digital competencies and learning with technology among university teachers.
3. Investigate the difference of different indicators of digital competencies and learning with technology between male and female university teachers.

Research Questions

The following were the research questions of the study:

RQ1: What is the level of digital competencies and learning with technology among university teachers?

RQ2: What are the indicators of digital competencies and learning with technology among university teachers?

RQ3: What are the differences between male and female university teachers about different indicators of digital competencies and learning with technology?

Research Design

The research study was descriptive in nature and a survey method was applied for the collection of data. It was an easy method to collect the responses of the respondents in a short time.

Population and Sample

The population comprised of all the teachers working in different campuses of the University of Education Lahore. Sixty teachers were randomly selected from different departments of the campuses. Among them 13 teachers were females and 47 teachers were males.

Instrumentation

The Teachers' Digital Competencies Survey [TDCS] instrument was adapted, validated and pilot tested upon a limited population. The Cronbach Alpha value of the instrument was .723 that was good for conducting a research study. The self-developed instrument, Teachers' Digital Competencies Survey [TDCS] were used. There were twenty-five items with seven indicators related to digital competencies and learning with technology. The indicators of the perceptions were Information Processing, Communication, Content Creation, Digital Safety, Problem Solving, digital motivation, and digital thinking. The reliability values were as under.

Table 1. Cronbach Alpha Values of Different Indicators

S. No	Indicators	Cronbach Value
1	Information Processing	.724
2	Communication	.676
3	Content Creation	.613
4	Digital Safety	.634
5	Problem Solving	.681
6	Digital Motivation	.650
7	Digital Motivation	.654

Research Procedure

The researchers developed the instrument and conducted the survey. The survey items were adapted from earlier studies (Al-Khateeb, 2017).

The survey was made during fall 2021 semester. The survey was conducted among university teachers. The statistical tests used were as follows.

Table 2. Questions with Appropriate Statistics

S. No	Questions	Statistical Test Applied
1	What is the level of digital competencies and learning with technology among university teachers?	Mean and sd

S. No	Questions	Statistical Test Applied
2	What are the indicators of digital competencies and learning with technology among university teachers?	Mean and sd
3	What are the differences between male and female university teachers about different indicators of digital competencies and learning with technology?	t-test for two groups comparison

Results

The statistical analysis was made using SPSS. The results were interpreted accordingly.

Table 3. Factors about the Digital Competencies and Learning with Technology

S. No	Indicators	Mean	sd
1	Information Processing	2.42	1.293
2	Communication	3.48	1.186
3	Content Creation	3.23	1.048
4	Digital Safety	3.37	1.005
5	Problem Solving	3.38	.755
6	Digital Motivation	3.50	.944
7	Digital Thinking	2.40	1.042

Table 3 revealed the six factors regarding the perceptions of teachers about the digital competencies and learning with technology in classrooms. The foremost indicator of digital competence was digital motivation with a mean value of 3.50 and sd value of .944. The second indicator of digital competence with a mean value of 3.48 and 1.186 sd value. The third indicator of digital competence was problem solving with a mean value of 3.38 and a .755 sd value. The fourth indicator of digital competence was digital safety with a mean value of 3.37 and a 1.005 sd value. The fifth indicator of digital competence was content creation with a mean value of 3.23 and a 1.048 sd value. The sixth indicator of digital competence was information processing with a mean value of 2.42 and a 1.293sd value. The seventh indicator of digital competence was digital thinking with a mean value of 2.40 and a 1.042 sd value.

RQ3: What are the differences between male and female university teachers about different indicators of digital competencies and learning with technology?

Table 4. Comparison between Genders of Teachers about Different Indicators of Digital Competence

Indicators	Gender	N	Mean	Std. D.	t	p
Information Processing	Male	47	2.62	1.344	3.233	.003**
	Female	13	1.69	.751		
Communication	Male	47	3.68	1.144	2.566	.013*
	Female	13	2.77	1.092		
Content Creation	Male	47	3.50	.994	6.602	.000**
	Female	13	2.22	.465		
Digital Safety	Male	47	3.64	.914	5.687	.000**
	Female	13	2.40	.689		
Problem Solving	Male	47	3.51	.753	2.793	.007**
	Female	13	2.88	.546		
Digital Motivation	Male	47	3.69	.937	3.447	.000**
	Female	13	2.78	.555		
Digital Thinking	Male	47	3.73	.417	5.059	.000**
	Female	13	2.68	.710		

***p<0.01 and *p<0.05*

According to table 4, t-test exposed the differences between males and females' teachers regarding the different indicators of digital competencies and learning with technology. It

revealed that there were statistically an apparent difference in gender of teachers about different indicators of digital competencies and learning with technology. The mean achievement score of male teachers (M = 2.62, SD = 1.344) and female teachers (M = 1.69, SD = .751, t(58) =3.233, p=0.003) about the indicator of information processing. The mean achievement score of male teachers (M = 3.68, SD = 1.144) and female teachers (M = 2.77, SD = 1.092, t(58) =2.566, p=0.013) about the indicator of communication. The mean achievement score of male teachers (M = 3.50, SD = .994) and female teachers (M = 2.22, SD = .465, t(58) =6.202, p=0.000) about the indicator of content creation. The mean achievement score of male teachers (M = 3.64, SD = .914) and female teachers (M = 2.40, SD = .689, t(58) =5.687, p=0.000) about the indicator of digital safety. The mean achievement score of male teachers (M = 3.51, SD = .753) and female teachers (M = 2.88, SD = .546, t(58) =2.793, p=0.007) about the indicator of problem solving. The mean achievement score of male teachers (M = 3.69, SD = .937) and female teachers (M = 2.78, SD = .555, t(58) =3.447, p=0.000) about the indicator of digital motivation. The mean achievement score of male teachers (M = 3.73, SD = .417) and female teachers (M = 2.68, SD = .710, t(58) =5.059, p=0.000) about the indicator of digital thinking. The research question about the differences between male and female university teachers about different indicators of digital competencies and learning with technology answered in positive. It was concluded that male teachers have used more digital technology with more confidence than that of female teachers.

Results and Discussion

The preference based digital competence was digital motivation, digital competence, problem solving, digital safety, content creation, information processing and digital thinking. It revealed that there were statistically an apparent difference in gender of teachers about different indicators of digital competencies and learning with technology. The research question about the differences between male and female university teachers about different indicators of digital competencies and learning with technology answered in positive. It was concluded that male teachers have used more digital technology with more confidence than that of female teachers.

Female teachers have less experience and confidence in using of computers in learning and teaching. They learn to use technology with help whereas male teachers use to learn by self. The study aligned with previous findings of Zhou and Xu (2007). The use of technology by female teachers is different from male teachers' usage. Female teachers use technology more than males, particularly using audio-visual aids like audio and videotapes. On opposite, male teachers' mean scores higher than that of female teachers' mean scores. This means that male teachers use communication tools like the internet more than female teachers. The current study supported previous studies that investigate males and females' technology integration with males higher use of technology (Astrid, 2002; Gibbs & Bernas, 2010; Tomte, 2008; Yuen & Ma, 2002; Top, Yukselturk , & Cakir, 2011).

References

Al Khateeb, A. M. (2017). Measuring Digital Competence and ICT Literacy: An Exploratory Study of In-Service English Language Teachers in the Context of Saudi Arabia. *International Education Studies*, *10*(12), 38–53. https://doi.org/10.5539/ies.v10n12p38

Ala-Mutka, K. (2011). Mapping Digital Competence: Towards a Conceptual Understanding. Institute for Prospective Technological Studies. https://pdfs.semanticscholar.org/6282/f40a4146985cfef2f44f2c8d45fdb59c7e9c.pdf%0Ahttp://ftp.jrc.es/EURdoc/JRC67075_TN.pdf%5Cnftp://ftp.jrc.es/pub/EURdoc/EURdoc/JRC67075_TN.pdf.

Ananiadou, K., & Claro, M. (2009). 21st century skills and competencies for new millennium learners in OECD countries (OECD Education Working Papers, No.41). OECD Publishing: http://dx.doi.org/10.1787/218525261154

Astrid, M. S. (2002). Gender differences in computer-related control beliefs and home computer use. *Scandinavian Journal of Educational Research, 46*(4), 409-426.

Bawden, D. (2001). Information and digital literacies: a review of concepts. *Journal of Documentation*, *57*(2), 218–259. https://doi.org/10.1108/eum0000000007083 .

Berge, O. (2017). Rethinking Digital Literacy in Nordic School Curricula. *Nordic Journal of Digital Literacy*, *12*(01–02), 5–7. https://doi.org/10.18261/issn.1891-943x-2017-01-02-01

Bocconi, S., Chioccariello, A., Dettori, G., Ferrari, A., & Engelhardt, K. (2016). *Developing computational thinking in compulsory education - Implications for policy and practice* (Technical Report). Joint Research Centre website: https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical

Carretero, S., Vuorikari, R., & Punie, Y. (2017). *DigComp 2.1: The digital competence framework for citizens with eight proficiency levels and examples of use.* Publications Office of the European Union, Luxembourg.

Cukurova, M., Mavrikis, M., & Luckin, R. (2017). Evidence-Centered Design and Its Application to Collaborative Problem Solving in Practice-based Learning Environments About Analytics for Learning (A4L); SRI International: London, UK.

Ferrari, A. (2013). Digcomp: *A framework for developing and understanding digital competence in Europe* (Technical Report). the website of Publications Office of the European Union: Publications Office of the European Union: http://publications.jrc.ec.europa.eu/repository/bitstream/JRC83167/lb-na-26035-enn.pdf

Fulton, C., & McGuinness, C. (2016). *Digital Detectives: Solving Information Dilemmas in an Online World.* Chandos Publishing, Kidlington, Cambridge, MA.

Gazi, Z. A. (2016). Internalization of digital citizenship for the future of all levels of education. *Education in Science, 41*(186), 137-148.

Gibbs, W. J., & Bernas, R. S. (2010). Gender differences in online communication of teacher preparation students. In Yamamoto, J., Penny, C., Leight, J., & Winterton, S. (Eds.), Technology leadership in teacher education: Integrated solutions and experiences (pp. 45-66). Hershey, PA: IGI Global.

Gilster, P. (1997). *Digital Literacy.* Wiley Computer Publications, NY.

Hoechsmann, M, DeWaard, H. (2015). *Mapping digital literacy policy and practice in the Canadian education landscape: Media smarts* (Technical Report). the website of *Media smarts*: http://mediasmarts.ca/teacher-resources/digital-literacyframework/mappingdigital-literacy-policy-practice-canadian-educationlandscape.

Hollandsworth, R., Dowdy, L., & Donovan, J. (2011). Digital Citizenship in K-12: It Takes a Village. *TechTrends*, *55*(4), 37–47. https://doi.org/10.1007/s11528-011-0510-z.

Iansiti, M., & Richards, G. (2020). Coronavirus is widening the corporate digital divide. *Harvard Business Review,* https://hbr.org/2020/03/coronavirus-is-widening-the-corporatedigital-divide?autocomplete5true.

Ilomäki, L., Taalas, P., & Lakkala, M. (2012). Learning Environment and Digital Literacy: A Mismatch or a Possibility from Finnish Teachers' and Students' Perspective. In Trifonas P (Ed.), *Living the Virtual Life: Public Pedagogy in a Digital World* (pp. 63–78). Routledge.

Ilomeaki, L., Kantosalo, A., & Lakkala, M. (2011). What is digital competence? Linked Portal, European Schoolnet (EUN), Brussels, pp. 1-12.

International Federation of Library Associations and Institutions (IFLA) (2017). IFLA Statement on digital literacy. https://www.ifla.org/publications/node/11586.

ISTE Standards. (2007). International Society for Technology in Education. https://iste.org/iste-standards.

Kara, N. (2018). Understanding university students' thoughts and practices about digital citizenship: A mixed-methods study. *Journal of Educational Technology and Society, 21*(1), 172-185.

Kaware, S. S., & Sain, S. K. (2015). ICT application in education: an overview. *International Journal of Multidisciplinary Approach & Studies*, *2*(1), 25-32.

McGuinness, C., & Fulton, C. (2019). Digital literacy in higher education: a case study of student engagement with e-tutorials using blended learning. *Journal of Information Technology Education: Innovations in Practice,* (18), 1-28.

Morgan, S. (2019). *Focus on graduate skills. The Association of Graduate Careers Advisory Services and The Quality Assurance Agency for Higher Education*, Glasgow: https://www.qaa.ac.uk/docs/qaas/focus-on/employers%27-and-graduates%27-views-of-graduate-skills-report-2019-08-22.pdf?sfvrsn=8906c681_8.

Perlmutter, T., Ungerleider, C., Scott, S., Jones, B., Jenkins, T., Wilson, I., & Hoechsmann, M. (2010). *Digital literacy in Canada: From inclusion to transformation* (Technical Report). the website of *Media smarts*: http://mediasmarts.ca/sites/mediasmarts/files/pdfs/publication-report/full/digitalliteracypaper.pdf

Redecker, C., & Punie, Y. (2017). *Digital Competence of Educators*. DigCompEdu.

Ribble, M. S., & Bailey, G. D. (2004). Digital citizenship focuses questions for implementation. *Learning and Leading with Technology, 32*(2), 12-15.

Tomte, C. (2008). *Return to gender: Gender, ICT and education. Background paper for the OECD Expert meeting hosted by the Norwegian Ministry of Education and Research*. Oslo, Norway.

UNESCO. (2011). *UNESCO ICT Competency Framework for Teachers*; UNESCO: Paris, France.

Van Deursen, A., & van Dijk, J. (2008). Measuring Digital Skills: Performance Tests of Operational, Formal, Informal and Strategic Internet Skills among the Dutch Population. ICA Conference. https://www.utwente.nl/en/bms/vandijk/news/%20measuring_digital_skills/MDS.pdf.

Van Laar, E., Van Deursen, A. J., Van Dijk, J. A., & De Haan, J. (2017). The relation between 21st-century skills and digital skills: A systematic literature review. *Computers in Human Behavior*, *72*, 577–588. https://doi.org/10.1016/j.chb.2017.03.010.

Voogt, J., & Roblin, N. P. (2012). A comparative analysis of international frameworks for 21stcentury competences: Implications for national curriculum policies. *Journal of Curriculum Studies, 44*, 299–321.

Yuen, H. K., & Ma, W. K. (2002). Gender differences in teacher computer acceptance. *Journal of Technology and Teacher Education, 10*(3), 365-382.

Yukselturk, E., & Bulut, S. (2009). Gender differences in self-regulated online learning environment. *Educational Technology & Society, 12*(3), 12–22.

Zhao, Y., Llorente, A. M. P., & Gómez, M. C. S. (2021). Digital competence in higher education research: A systematic literature review. *Computer Education, 168*, 104-212.

Zhou, G., & Xu, J. (2007). Adoption of Educational Technology: How Does Gender Matter? *International Journal of Teaching and Learning in Higher Education, 19*(2), 140-153 http://www.isetl.org/ijtlhe/