

Are female secondary school teachers in Bangladesh becoming digitally empowered or disempowered? An exploratory analysis of the impact of digital empowerment on professional development

Sharmin Nahar*

<https://orcid.org/0009-0003-4146-1110> (ORCID iD)

University of Rajshahi (Bangladesh), Directorate of Secondary and Higher Education
(Bangladesh)

Nahar, S. (2023). Are female secondary school teachers in Bangladesh becoming digitally empowered or disempowered? An exploratory analysis of the impact of digital empowerment on professional development. *Journal of Management and Business Education*, 6(3), 375-394. <https://doi.org/10.35564/jmb.2023.0020>

*Corresponding author: nahardu2002@gmail.com

Language: English

Received: 28 Jan 2023 / Accepted: 28 September 2023

Funding. The authors received no financial support for the research, authorship, and/or publication of this article.

Ethic statement: The research was designed in a way that protects the privacy and confidentiality of the participants. It was assured that any data collected cannot be used to identify individual participants. The researcher obtained informed consent from the participant in the study. All participants in this study were fully informed about the research, its purpose, and any potential risks or benefits, and they are voluntarily agreed to participate. The confidentiality and privacy of all participants was ensured by using anonymized identifiers in data collection and analysis, storing all collected data securely and accessible only to the researcher.

ABSTRACT

Differences in access, skills, and usage of digital technology between men and women have resulted in an unequal experience in using digital technology in changing work environments, especially in education, which is expressed as the gender digital divide. This divide serves as a barrier to digital empowerment and tends to be wider in developing countries. However, there is a scarcity of literature on digital empowerment among female teachers at the secondary school level. Therefore, based on Makinen's (2006) perspective, this study investigated digital empowerment among Bangladeshi teachers with respect to gender-based differences. Data on the four components of digital empowerment mentioned by Makinen were collected using a semi-structured questionnaire from a random sample of 326 respondents, along with the qualitative method of an in-depth interview and focused group discussion from three city corporations: Dhaka, Khulna, and Rajshahi, according to their digital divide rates. The findings reveal that both overall awareness and technical access status are satisfactory. Yet, female teachers lacked significant intrinsic motivation and computer abilities to perform specific tasks. Findings also revealed that empowered women had better levels of professional capabilities, self-confidence, and more Information and Communication Technology (ICT)-based pedagogy. Female teachers should be recognized and

encouraged in institutional programs to promote digital empowerment and reduce the digital divide between genders.

Keywords. ICT, gender digital divide, digital empowerment, awareness, motivation, technical access, competence, ICT ambassador.

RESUMEN

Las diferencias en el acceso, habilidades y uso de la tecnología digital entre hombres y mujeres han resultado en una experiencia desigual en el uso de la tecnología digital en entornos laborales cambiantes, especialmente en la educación, lo que se manifiesta como la brecha digital de género. Esta brecha sirve como una barrera para el empoderamiento digital y tiende a ser más amplia en países en desarrollo. Sin embargo, existe escasa literatura sobre el empoderamiento digital entre las profesoras de secundaria. Por lo tanto, basándonos en la perspectiva de Makinen (2006), este estudio investigó el empoderamiento digital entre profesoras bangladesíes con respecto a las diferencias de género. Se recopilaron datos sobre los cuatro componentes del empoderamiento digital mencionados por Makinen mediante un cuestionario semiestructurado de una muestra aleatoria de 326 encuestados, junto con el método cualitativo de una entrevista en profundidad y una discusión en grupo centrada en tres corporaciones municipales: Dhaka, Khulna y Rajshahi, de acuerdo con sus tasas de brecha digital. Los resultados revelan que tanto la conciencia general como el estado de acceso técnico son satisfactorios. Sin embargo, las profesoras carecían de una motivación intrínseca significativa y habilidades informáticas para realizar tareas específicas. También se encontró que las mujeres empoderadas tenían mejores niveles de capacidades profesionales, autoconfianza y una pedagogía más basada en las Tecnologías de la Información y la Comunicación (TIC). Las profesoras deben ser reconocidas y alentadas en programas institucionales para promover el empoderamiento digital y reducir la brecha digital entre los géneros.

Palabras clave. TIC (Tecnologías de la Información y la Comunicación), brecha digital de género, empoderamiento digital, conciencia, motivación, acceso técnico, competencia, embajador de las TIC.

INTRODUCTION

Although both male and female internet access and mobile device access are increasing, the digital gender gap remains a persistent global issue in which fewer women access and use Information and Communication Technologies (ICTs) than men (Acilar, 2011; Antonio and Tuffley, 2014; Mumporeze & Prieler, 2017). In today's tech-driven era, equitable access to digital resources and skills is vital in all sphere of life, notably education. Gender-based discrepancies in global internet and technology access underscore inequality in this realm. In the era characterized by rapid technological advancements, access to digital resources and skills has become pivotal for various sphere of life including education where a persistent disparity has emerged highlighting unequal access to digital technologies and the internet based on gender throughout the world. Globally, 48 percent of the female population and 53 percent of the male population utilize the Internet (ITU, 2020). Women are also less likely to have the digital skills needed to effectively participate in the digital economy (World Economic Forum, 2022).

Bangladesh is not an exception. To fulfill the Sustainable Development Goals (SDGs), notably SDG-4 for quality education and SDG-5 for gender equality and women's empowerment, the country has integrated ICTs into its national plans, driving substantial infrastructural enhancements (Zaman & Uzzaman, 2015). Despite advancements in telecommunications coverage, the gender

gap persists and is widening in many developing countries, including Bangladesh (Dijk, 2012; OECD, 2018).

The use of technology in education has grown rapidly in recent years, creating new opportunities for teachers and students to improve their learning experiences. Despite the rising significance of digital technology in education, gender disparity among teachers remains an ongoing concern (Somro, 2020). It has an impact on teachers' digital empowerment since they are unable to effectively access and use digital technology to enhance their teaching and learning techniques, impeding the attainment of sustainable development.

The gender perspective is important in this research because there is evidence that, due to low representation in ICTs, women were more affected by the rapid development of digital technology, leaving many female teachers having difficulty to sustain up (Avidov-Ungar, 2018). Previous research (Kennedy et al., 2003) has highlighted gender-based disparities in technology usage, a divide deeply influenced by structural gender inequalities (Schradié, 2015). These disparities hinder the seamless integration of ICT into education, especially as ICT gains traction within schools of this nation, with female educators progressively entering and dominating the teaching sphere (Islahi, 2019). In this context, the exploration of the holistic digital empowerment of female teachers—encompassing digital skills, external and internal motivations, awareness, and technical access—remains insufficiently examined, demanding further investigation. Additionally, this article contributes to the literature on gender equality in business economics by providing some answers to previous calls (Diez et al, 2023) about what skills enable the improvement of organizations' gender equality, and the teaching challenges affecting the implementation of the new business teacher' curriculum (Muhwezi, 2023). The current research will also look into how empowered female teachers feel positive improvements in their professional lives.

LITERATURE REVIEW

ICT empowers educators to enhance their teaching methods and gain proficiency in utilizing diverse computer technologies. Halfkin (2003) in her paper discovered that women's empowerment through knowledge led to improved self-esteem, bolstering career prospects and elevating their standing both in their community and profession. The involvement of 'D.net' and 'Amader Gram' two ICT projects in Boitpur and Srifoltala villages in Bangladesh showed, the women who are using ICT tools have a higher confidence level, self-awareness, more self-esteem and dignity (Zubannesa, 2015). In recent years, international concern has grown over gender disparities in access to the internet and other ICTs, even in developed countries (Acilar, 2011). According to Li and Kirkup (2007), men are more confident in their computer skills and are more likely to use email than women. Saha and Zaman (2017) found that while there are no major variations in ICT access, there is a considerable disparity between genders in ICT skills.

It should be noted that gender disparities restrain women from fully leveraging ICT benefits for empowerment. Teachers encounter various challenges that impact their readiness to implement ICTs into their teaching learning process. Awodiji et al. (2022) discovered that increased domestic obligations of Nigerian female lecturers could hinder their involvement in professional development. Gender imbalances in participation could result from diverse factors like domestic duties, cultural norms, and socioeconomic status. There is some degree of internal and external factors that prevent women from being fully empowered (Beena, Mathur, 2012). Laudari and Maher (2019) identified barriers to effective digital technology integration in teacher education in a study at a teacher training institution (faculty) in a developing country. External challenges encompass resource scarcity, inadequate training, unfavorable policies, and inflexible curriculum. Internal obstacles involve educators' personal attitudes, motivation, and perspectives towards technology. There are some cultural and psychological factors that may constrain women from using technology even when they have access (Terry and Gomez, 2010). Women's access to computers and the

internet is influenced by feelings of self-worth and self-confidence, significant home responsibilities, gender norms, and computer fear (Tyers, 2012).

In a different study using a digital empowerment scale, Bukket and Ayhan (2011) discovered that aspiring educators had a moderate self-efficacy belief in information literacy, with some categories showing higher self-efficacy. The study also revealed positive motivation, yet digital empowerment in the empowerment category was somewhat unsatisfactory. In Uganda, Taban (2012) demonstrated teachers' enthusiasm for integrating ICT in education despite obstacles like scarce software, few classroom computers, slow internet, teacher-student ICT motivation, inadequate training, outdated equipment, technical expertise gaps, insufficient administrative support, and outdated curricula. In While the mentioned studies employed quantitative research approaches, our present study adopted a mixed-method research strategy. This approach allowed the researcher to elucidate numerical data through qualitative findings and obtain a comprehensive understanding of the phenomenon.

Due to the rise of ICTs, the Bangladesh Ministry of Education (BMoE, 2013) formulated a master plan to enhance teachers' proficiency via ICT. The ICT policy targets equipping educators with essential technological skills to empower teachers digitally in order to seamlessly integrate ICTs into their teaching. Despite being the most significant stakeholders in integrating ICT into pedagogy, the number of qualified teachers is low, and most teachers in Bangladesh are unwilling to use technology in the classroom due to a lack of computer knowledge (Mou, 2016). According to Hasan and Khan (2013), few teachers are knowledgeable with and comfortable with the idea of using different forms of ICT, not even in the largest cities in Bangladesh.

The reviewed literature depicts the gender digital gap, attributing it to restricted device access, connectivity, and digital skills among female educators. Moreover, much of the research on gender's IT impact has focused on Western nations. (Li and Kirkup, 2007). Hence the highlighted text lacks the Bangladeshi context that the current study addressed by exploring to what extent female teachers are empowered through four components of digital empowerment followed by Makinen's framework (2002) because the decision to use technology does not depend solely on technical access (having or not having devices), but also on awareness, motivation, and the ability to use new information technologies (Dijk, 2017). Moreover, fostering teacher development amplifies improvements in teaching, research, skill advancement, and knowledge acquisition. (Rio & Newman, 2022; Taddese & Rao, 2021). The literature further shows that for the collective empowerment of women, ICT's potentiality is well recognized (Martinez and Reilly, 2003) but the changes that people go through when they fulfill all of the components of digital empowerment have not been adequately described in the existing literature in the context of developing nations, and Bangladesh in particular. Hence, within this context, the present study seeks to investigate the transformations experienced by female educators upon attaining digital empowerment.

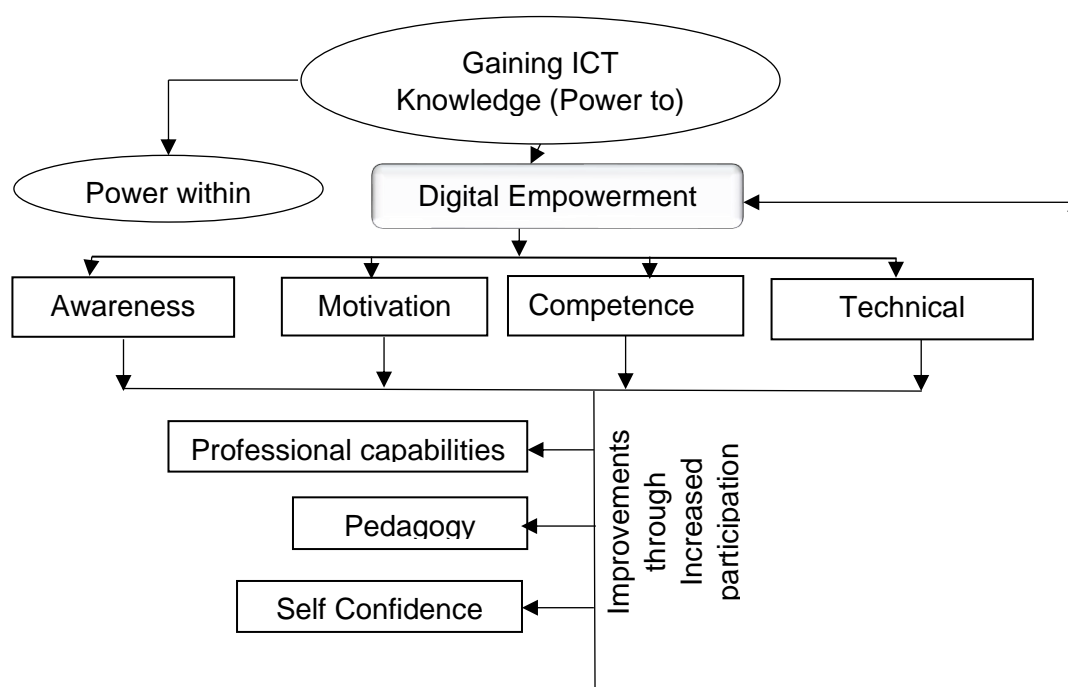
CONCEPTUALIZING DIGITAL EMPOWERMENT

This research is built upon the idea that empowerment varies in manifestations across individuals and contexts, posing challenges in defining or explaining its nature and attainment (Jennings et al., 2006). Combining the concepts of power and empowerment, the researcher will explain what empowerment means in the context of empowerment through ICT. According to Purushothaman (2013), power in this context has a transformative sound, an implied promise of change, frequently for the better. The presence of digital competencies, knowledge, and abilities can be used to measure power. As a result, being disempowered means lacking all three of the aforementioned qualities. According to this concept of power, any improvement in the knowledge that instructors have access to is, in and of itself, an indicator of empowerment. People are becoming more self-aware and confident, or developing power within themselves, as their digital

skills improve (Oxaal and Baden, 1997). Lack of digital knowledge, skills, and confidence are viewed as the main root causes of their powerlessness in the context of the current study.

Based on the concept of power, empowerment means a change from being powerless to being powerful. Digital empowerment isn't just about having or using digital tools; it's a multi-step process fostering networking and collaboration to enhance individuals' skills (Mäkinen,2006). Awareness, motivation, technical access, and competence are the components that enable individuals to engage in the application of new technology and play a meaningful role in the evolution of society (Mäkinen, 2006). As an ongoing process, digital empowerment begins with the acquisition and improvement of the four basic conditions required for the empowerment process. When these conditions are met, the process results in some changes to the aforementioned elements, which keep the process moving ahead and result in some improvements at the individual level through increased engagement, which are empowering for the community and its members. Continuous improvements are made throughout the process; yet the process does not come to a finish; rather, it is always evolving and demanding to be renewed.

Figure 1. Conceptual Framework of the Study



Source: Developed from Maarit Mäkinen (2006)

METHODOLOGY

Research Approach

The proposed study has followed a mixed-methods approach to explore digital empowerment in its four components (awareness, motivation, technical access, competence) and disclose the changes teachers go through when they fulfill the above four components of the digital divide. Moreover, to triangulate data, a mixed-methods approach is needed.

Research Method and instruments

A semi-structured questionnaire followed by a series of closed and open-ended questions was chosen as the primary instrument of data collection. To triangulate data, three in-depth interviews

were conducted with ambassadors of the Teachers' web portal in three respective areas. Three focused group discussions with both male and female teachers were chosen from three areas. The respondents were assured that the information they provided would not be misused and would only be used for this research strategy.

Selection of Study Area

The study area has covered three city corporations: Dhaka, Khulna, and Rajshahi, according to their digital divide rates (BBS, 2013). Having urban characteristics, city corporations represent urban areas in Bangladesh, where most of the facilities and services are concentrated.

Population and sample size determination

The population of the research includes all secondary school teachers (junior secondary, secondary, and school sections of schools and colleges) of three regions having a membership in 'Shikkhak Batayon', a teachers' web portal, as they are advanced users. Madrasa has been excluded as it has a scant percentage of female teachers (BANBES, 2017). The population of this study area is 2560 (Member of the web portal, a2i, Prime Minister Office, estimated until March 2017). The representative sample size was calculated at 326 using Cochran's formula (Cochran, W. G., 1977) for a finite population.

$$n = \frac{z^2 \cdot p \cdot q \cdot N}{e^2(N-1) + z^2 \cdot p \cdot q}$$

Where, n = Sample size that want to know

N=2560; Total number of secondary school teachers.

Z=1.96 at 95% Confidence level, p=0.5 is the estimated population proportion that maximizes the sample size. q= 1-p, e=error limit at 5% (0.05).

Sampling

The sample was distributed based on the study location and gender. Dhaka, Khulna and Rajshahi City Corporation represent respectively 57, 23 and 20 percent of total secondary school teachers (BANBEIS, 2017). 186, 75, and 65 respondents were chosen at random from three different places using proportionate sampling. Each number is proportional to the overall population of each area. According to the percentage of male and female teachers in three city corporation areas (BANBEIS, 2017), 155 female and 171 male respondents were distributed. A random selection of respondents was used as part of the sampling technique.

Analysis and Interpretation

Quantitative data were entered into the computer and analyzed using SPSS 22. A descriptive analysis by running a frequency table was used to describe digital empowerment. Gender gap data in ICT access in terms of awareness, motivation, technical access, and digital competencies was analyzed in a series of tables. The in-depth interviews and focused group discussions were analyzed by thematic analysis, which is thought to be appropriate for this research.

FINDINGS AND DISCUSSION

Demographic features

Nearly half of the respondents (45.4%) of the total respondents belong to the age range of 30 to 40 years. Of the total, 10% was over 50 years old, and 14% was below 30 years old. All the respondents belong to middle-income groups. Only 27.09% of female respondents' (42 out of 155)

a monthly family income was above 50,000 taka, as both husbands and wives were employed. 28% of respondents' (both male and female) income was below \$16,000 as they did not get a monthly pay order (MPO). Regarding ICT training, nearly half of the female teachers did not receive ICT or a computer-related training. A vast majority of teachers belong to the humanities group.

Awareness

Understanding the potential benefits of utilizing any new technology is referred to as awareness, which is one of the more important factors for all types of empowerments than technological availability when deciding whether or not to use ICTs (Fox, S., and Duggan, M., 2022). The present study investigates teachers' perceptions of the usefulness of ICTs like computers and the internet in education.

Table 1. Awareness and access to ICT at school and personal levels by gender

Do you believe ICT use would bring benefit to your daily life or in profession?			
	Yes	No	Don't know
Male (%)	95.3	3.5	1.2
Female (%)	96.1	1.3	2.6
Does your institution have computer labs with multimedia network?			
	Yes	No	Don't know
Male (%)	90.0	8.2	1.8
Female (%)	91.0	6.5	2.6
Total (%)	90.5	7.4	2.2
What is your opinion about the availability of Multimedia classroom?			
	Good	It would be better to have more	Neutral
Male (%)	22.8	68.3	9.0
Female (%)	28.7	63.3	8.0
Total (%)	25.6	65.9	8.5
Do you have an internet connection in your personal device (Mobile or Computer)?			
	Yes	No	
Male (%)	86.0	14.0	
Female (%)	87.1	12.9	
Total (%)	86.5	13.5	

Source: Field Survey, 2019

The respondents were asked if they believed ICT use would benefit their daily lives or their profession. The result showed that both genders, 95.3% of males and 96.1% of females, showed positive attitudes and recognized the benefits and importance of ICTs, which is aligned with another study where the teacher educators have awareness for ICT integration in teaching, personal, recreational, and research contexts (Philomina and Amutha, 2016). However, the insignificant difference in attitude between male and female teachers observed in this study is in contrast with another earlier study where male teachers reported slightly more positive attitudes than their female counterparts (Gebhardt et al., 2019). With more Internet connectivity, more affordable cellphones, and a sharp increase in social networking, we have observed a growth in the number of consumers who are digitally savvy since Bangladesh has experienced rapid growth in the ICT sector during the past three years (*The Daily Star*, February 23, 2017).

Motivation

Motivation, another crucial component of digital empowerment, may be defined as the force that drives people to engage in activities and perform better (Gasaymeh et al., 2017). This study has

generally classified the factors influencing the teachers' motivation to use ICTs into two categories: extrinsic factors and intrinsic factors (Schulz et al., 2015).

Extrinsic factors

If the institution provides enough ICT infrastructure and other supports such as laptops, Wi-Fi connections, technical help, etc., which are referred to as extrinsic variables, teachers will be greatly inspired and motivated (Roy, 2022). The respondents were asked whether their institutions have multimedia classrooms with a network and an ICT lab. Almost all participants admit that they can get access to digital technology at their school. 90.5% of total teachers say they have Multimedia classrooms with internet and ICT labs at their institutions (see Table 1). In terms of multimedia classrooms, one-fourth of the total respondents opined that they have adequate facilities with laptops, projectors, and internet connections. For the use of ICTs in education, 32,667 educational institutions now have at least one multimedia classroom with a laptop, a multi-media LCD projector, and an Internet connection (Ministry of Education, 2019). This suggests that the Bangladesh government, like many other nations, takes the use of ICTs in schools very seriously and is investing extensively in education, making significant efforts to close the gap in material access, and making great strides forward. However, 65.9% said they have the facilities, but it would have been better to have more (Table 1). One respondent noted:

"The computers provided in our institution are not enough. We were provided with two computers, one of which gets dysfunctional after a while. The damaged laptop could not be fixed due to funding problems. Additionally, there is a need to hire professionals to help us and do necessary maintenance." (Focused Group Discussion- Rajshahi).

Despite recent progress, the issue of rural areas is more germane, where polarizations of wealth and services remain critical issues and majority of the population lives.

Intrinsic factors

Despite having ample facilities, teachers did not use ICTs in their instruction, and it depends on the willingness of teachers to incorporate new technologies into the teaching and learning process (Kler, 2014). Because of this, it's crucial to understand the essential qualities of teachers, such as their interest in ICTs and confidence, that connect to the intrinsic factors. Self-confidence, which is described as one's belief in one's ability to accomplish anything with success, is closely related to one's interest in ICTs (Roy, Cox, et al.). Based on their self-perceived beliefs, the respondents were asked, Could you confidently perform the following tasks using a computer? The results of the questionnaire were divided into two parts: One showing whether individuals can perform the following tasks with confidence and another showing why they cannot, which are displayed in Table 2 below.

Table 2. Self-perceived confidence of ICT Knowledge by gender

Do you perform the following PC based activities confidently?	Yes (%)		No (%)		Don't know(%)	
	Male	Female	Male	Female	Male	Female
Installing software	66.1	39.4	8.1	30.3	15.8	30.3
Scan and printing	66.7	29.7	17.5	42.6	15.8	27.7
Document download and save	76.0	67.7	9.4	18.1	13.5	14.2
Spreadsheet	46.8	11.6	32.7	45.2	20.5	43.2
The reason behind the less confidence doing the above functions						
	Reason					
	Lack of skills		Lack of motivation		Lack of time	
Male (%)	59.4		18.8		15.6	
Female (%)	64.2		16.6		6.5	

Source: Field data 2019

The surveyed teachers responded with their perceived confidence in a few basic software applications such as word processing, spreadsheets, presentation software, e-mailing, and internet browsers. When the values given in Table 2 were examined, it was seen that except for downloading and saving documents, significant gender differences were seen in the belief of their ability to do the specific software applications. In contrast to the 39.4% of female respondents, 66.1% of male respondents said they can install software with confidence. The majority of female respondents (42.6%) lack confidence when scanning and printing. The circumstances are the same for other chores. Shikha (2014) discovered similarly that a lack of knowledge and the newest technology among teachers can contribute to their lack of confidence, which makes them averse to employing ICT in the classroom. A list of reasons why teachers lack confidence in using computers and the internet was also provided to them. Table 2 shows that insufficient abilities and a lack of interest are the two most common causes of a lack of confidence. Lack of time is the least prevalent justification. Mentioning lack of skills as the major backward driving force behind reluctant ICT use, a female member said during a focus group discussion:

"We, the women, cannot continue training properly, which is why we do not feel comfortable and do not have much confidence in using ICTs. As a result, we need to spend a lot of time and effort to prepare multimedia content for the class, which is barely tough for us." (Focused Group Discussion—Dhaka)

However, not just skills and abilities in using ICTs, but the intrinsic factor of explaining motivational access is also of a social and psychological nature (Van Dijk, 2012). An explanation that an ICT male trainer holds that:

"It's not that female teachers can't; rather, they do not have strong willpower to work with computers. Many female teachers have had computers and internet access at home for a long time, but they are not habituated to working with computers. Maybe they have a Facebook account and are active on social media." (Interview, In-depth--2).

From the above discussion, it has come out that female teachers lack endogenous motivation, though some teachers are using digital tools and are self-motivated, but most of them claim that becoming ICT skilled or using technology in the classroom could bring a few benefits to their professional lives because their job-related facilities like salary increments or promotions do not relate to skills development. Consequently, they are unwilling to put extra effort and time into using ICTs rather than spend time on their child rearing and home management (FGD-Dhaka). This is in line with Omotayo's (2022) submission that gender imbalances in lecturer participation in professional development can be attributed to factors like domestic responsibilities, cultural norms, and socioeconomic status where women's roles as homemakers might hinder their involvement due to academic demands. However, the findings contradict those of Alazzam et al. (2012), who found no significant variations in ICT attitudes between genders but a considerable disparity in ICT abilities between men and women. Teachers' behavioral intention to use a computer depends on whether it is easy to use and suitable for the teaching process. Lack of perceived ease to use, as Davis developed it, describes the degree to which a person believes that using a particular system would be free of effort, which would be another reason (Purushothaman, 2013). Since female teachers lack the required knowledge to acquire skills in those activities, the use of computers is more cumbersome because very specific efforts are needed, which take extra time.

The technical access

Owning a computer and having access to the internet are prerequisites for using digital technology and developing digital skills (Van Dijk, 2002). Do you have an internet connection? was a question to which teachers had to respond. The study's findings indicated that the gap in internet access was progressively closing; 86.5% of all respondents claimed they used a personal mobile device or computer to access the internet, while the corresponding figures for women and men were 87% and 86%, respectively (see Table 1). The underlying cause can be socioeconomic

status, where people with higher incomes and education are still more likely than others to have good access to digital resources (Soltan, 2016). In the same way, from the demographic profile, it has been found that all the respondents in this study are school teachers, belong to an educated group, and are employed. In Bangladesh, just 8.7% of the poorest 20% of families have access to the internet at home, compared to 75.3% of the richest 20% of households (New Age, April 18, 2021). Unlike the internet, a significant difference was found in computer ownership, as we saw earlier, though a good number of female teachers said that they have access to computers at home. As new information and communication technologies become increasingly pervasive in society. As a result, there is a rapid growth in the desire for individuals to own computers and have access to the internet. Despite an increase in women's access to computers, this does not always translate to their actual use if there is no need or desire.

Digital competence

Because professional development depends on the effective and appropriate use of ICTs, digital competence is one of the important competencies that citizens in general and teachers in particular must possess in the society of the future. One factor that usually correlates with gender is the lack of digital competence, with women generally appearing to be less skilled in ICTs (Grande-de-Prado et al., 2020). In order to represent less frequent and more frequent users of ICTs, teachers were asked to respond on a four-point scale with the words "rarely," "at times," "often," and "very often" when asked how much experience they had with computers and mobile devices, since computers are more multipurpose than any other media and allow for the use of people in incredibly diverse ways. The survey found that women utilized mobile devices more frequently than computers.

Table 3. Use of mobile and computer by gender

Frequency of use			Computer (%)	Mobile (%)
Less frequent	Male	Rarely	5.8	6.4
		At times	28.7	22.2
	Female	Rarely	17.4	0.6
		At times	38.1	24.5
More frequent	Male	Often	38.0	34.4
		Very often	4.1	21.1
	Female	Often	15.5	27.7
		Very often	5.2	31.6

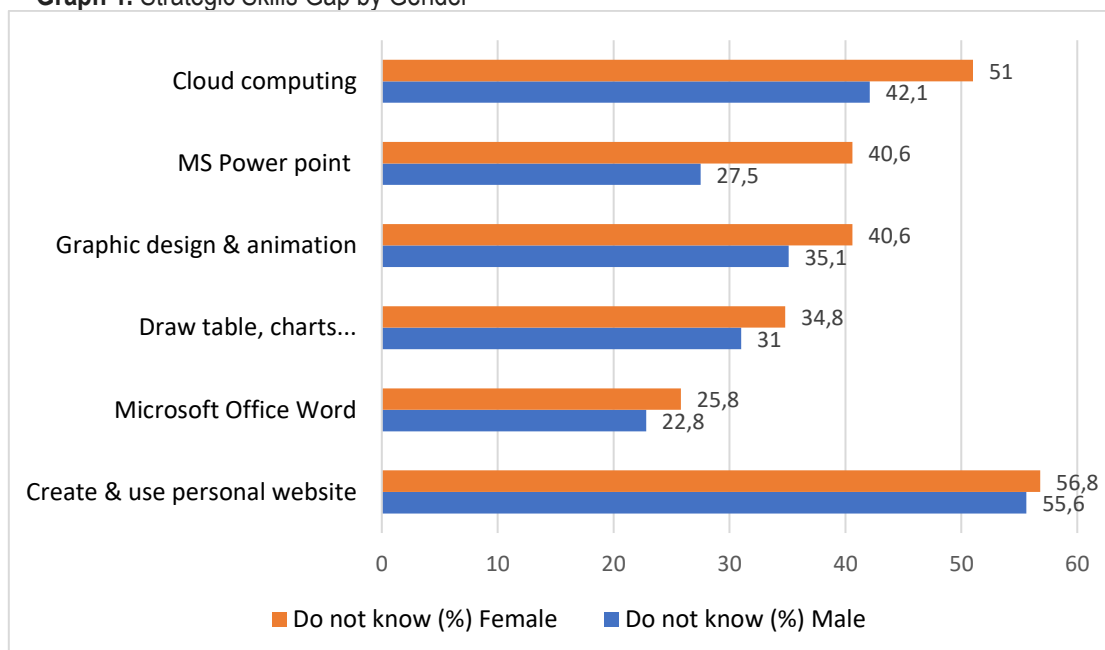
Source: field data 2019

The percentage of teachers who claimed to use a computer or a mobile device at home, at school, or anywhere else is shown in the aforementioned table. In comparison to male users, who make up only 34.5% of teachers, more than half of female teachers, 55.5% (17.4+ 38.1), use computers less frequently. While just 20.7% of female teachers use computers frequently, over half of male teachers (42.1%) (38.0+4.1) are frequent computer users. In contrast, 59.3% of female teachers (27.7% + 31.6%) regularly use their mobile devices, compared to 55.5% of male teachers. However, merely owning and frequently using a smartphone does not imply that a woman is sufficiently tech-savvy to gain empowerment (Peggy Tse, 2021). Many female teachers do not know how to send an email. They are using social media, but they hardly know how to give universal passwords to protect against cybercrime. Again, they do not know even about the two-step verification code to open an email (*Interview, In-depth-1*).

Digital skills also include the ability to strategically use this knowledge to advance one's position in society. These abilities are referred to as instrumental and strategic skills. Women may have

trouble implementing them in a learning context because they lack the necessary skills to carry out creative tasks.

Graph 1. Strategic Skills Gap by Gender



Source: Field Survey, 2019

The study's findings demonstrated that there is a considerable gap in each of the response categories for strategic skills, including content production, website development, graphic design, and video editing (details are given in Chart 1). The aforementioned claim is consistent with another study demonstrating that male university instructors are more knowledgeable about specific ICT tools and possess higher ICT abilities than their female counterparts. However, a study on instructors found that gender is not a significant predictor of real skills, even though women typically assess their own talents as being lower than those of men (Harigattai, Eszter, and Steven Shafer, 2006). Interestingly, significant female teachers using PowerPoint slides in the classroom demonstrate that female teachers simply display a slide that has been created by someone else in the classroom after editing their name because, because of the easy availability of PowerPoint slides, they don't want to put a lot of effort into creating them (*Interview, In-depth-2*). Despite the government's extensive efforts to train teachers in digital competency, many times the main objective of training is not achieved. Some teachers inquire about the allowance they will receive or the financial rewards they might expect from their training before enrolling. Once more, some teachers view training as a type of amusement where they take pictures, post them to Facebook, and spend time outside of the classroom to break up their routines. (FGD 1-Dhaka).

POSITIVE CHANGES AFTER FULFILLING THE FOUR COMPONENTS OF DIGITAL EMPOWERMENT

Teachers may have made changes, such as gaining motivation through training regardless of their gender, which is closely related to one's proficiency with ICTs and a prerequisite for going digital (Passey et al., 2018). A large number of female instructors who have acquired knowledge and abilities in ICTs through training, workshops, seminars, or any other method experience some real transformations as a result of their education and have discovered personal empowerment. In

this section, I'll demonstrate how ICT knowledge brings empowerment to female teachers' careers. When it comes to computers and the internet, this empowerment can be achieved by looking into developments in personal capabilities, confidence in oneself, and pedagogy.

Develop professional capacities

Using Information and communication technology (ICT) enhances their professional capacities and opportunities (Buskens and Webb, 2014). Many female teachers who receive multimedia training see their capacities grow as a result of learning digital skills and adopting ICT-based instruction. A participant said during a focus group discussion:

"As teachers, we are learning to use a variety of technical resources, including software, applications, and other tools. When attending a workshop, we have to learn script writing using MS Word on the laptop. Again, we have to make PowerPoint presentations and learn using the multimedia projector in case we go to class. Here, it is also taught how to create students' exam result sheets using Microsoft Excel. In addition, we learn how to access various teachers' portals." (Focused Group Discussion—Dhaka)

The above statement confirms that through increase participation in digital learning they benefitted from taking the opportunity. Any undertaken professional development program (such as Higher Education Training, Conferences, and Workshops) by an institution should lead to heightened outcomes and growth for both the staff members and the university as a whole (Omotayo, 2022).

Increase motivation

Teachers typically suffer negative feelings, especially elderly and female teachers who endure techno stress due to their lack of technological knowledge, inefficiencies specifically connected to ICTs, and lack of updates and training (Gebhardt, E., 2019). Teachers showed less interest in professional ICT training, even in industrialized nations, according to the findings of a research study (Gebhardt, 2019). However, ICT training can increase the motivation of many female teachers, which is a prerequisite for becoming digital. When a teacher is interested in ICT, it helps to enhance his or her digital abilities. A female ICT master trainer speaks out:

"When I share my ICT success story with my colleagues in a training session, they, particularly female teachers, feel inspired and call me later to inform me about their work style. They are driven by their interests because they are aware that ICT cannot be replaced and there is no substitute for ICT." (Interview, In-depth-1)

The aforementioned claim makes it evident that female teachers who are confident using computers and other information technology in their work may serve as role models for their female colleagues. Several respondents responded positively when asked in what ways female teachers get motivated to join seminars or training related to ICTs. In response to the question of whether teachers benefited from training and, if so, how, they said they get motivated during or after training, seminars, or workshops. In this sphere, one of the ICT master trainers (male) comes up with:

"The head Teacher of my institution sent me to take ICT training in various institutions. In continuation of this, I attended a 15-day training on digital content creation at the Teachers Training College in Rajshahi. There I met some government and private teachers who were very proficient in ICT, and I learned more from the trainees sitting next to me than from the training. I found myself having a favorable willingness to put forth the effort necessary to advance my computer and internet skills." (Focused Group Discussion—Rajshahi)

This above comment suggests that a collaborative learning environment increases their participation in the learning process and inspires them to use ICTs as well as develop their skills. Although motivation is a personal trait, the social environment has a huge impact on it. In the early stages of employing new technology, social or peer reinforcement also has a motivating effect.

Many female teachers who avoid using computers out of fear are genuinely motivated. In this regard, a female teacher spoke about her experience:

"Being an introvert, I had trouble expressing myself. Furthermore, hesitation, fear, and a lack of computer knowledge and ICT training have led to a dire situation. However, I am incredibly motivated by my co-workers, who always encouraged me by saying, Yes, you can do it; just keep it up, and that gave me new enthusiasm for my work." (Focused Group Discussion—Khulna)

Increase technological work engagement

Employees are involved in their professional tasks when they show greater enthusiasm and interest, which inspires intrinsic motivation to participate in a specific activity known as the emotional dimension of job engagement (Prihatin, 2018). Many female teachers pay close attention, concentrate intently, and become emotionally involved while learning about new ICT opportunities. This inspires them to acquire cognitive expertise and boost technological participation. A female ICT master trainer told:

"By simply using the mouse to click on various alternatives, I was able to learn many times more in fourteen days of training provided and I stood first in that training and was subsequently nominated for ICT trainings from many national and international institutions. In essence, I have embraced ICT very happily, and it gives me a different feeling when creating a new slide." (Interview, in-depth-1).

According to the aforementioned claim, women's involvement in technology could rise if they are inspired and empowered to do so; otherwise, they might decide against using ICT tools that are available at home and at work owing to a variety of issues, such as lack of time. The voice of a male ICT ambassador:

"I have to stay up all night to create content. Six to eight classes are to be taken every day. The family has to give it time. There are also some social functions. So, time is a big factor. Do video editing and give animation when creating a slide; a lot of patience is required. Without invincible desire, it would not be possible." (Focused Group Discussion - Rajshahi).

Too much cognitive knowledge and skill can't be learned in a single course or training, but what occurs is that participants' interest grows and their confidence rises. People are motivated to engage in a variety of creative endeavors and attain a variety of online professional statuses as a result. They perform better and develop their creativity by achieving various online statuses. Due to creativity, people acquire the capacity to make decisions and take action on those decisions in a way that affects their lives, which is known as learner agency (Passey et al., 2018). In a digital setting, this means digital agency, which is concerned with choice, action, and changing how an individual goes about their task. As an illustration, one of the ICT instructors described her as a digital agency bellows:

"I have created a corner where all financial activities of the school, including scripts, are kept and named it 'Transparency Corner (Swachhata Corner), and a digital folder is created where they are stored. It promotes acting with integrity, accountability, and transparency in performing one of the important functions of the institution." (Focused Group Discussion -Khulna).

The respondents mentioned that "producer" tasks, which demand curiosity, knowledge, and skills, as well as hard effort, intrinsic drive, and enthusiasm, are crucial for creating digital agencies. Teachers and other females of any profession using ICT can start YouTube channels. Running YouTube channels allows many female teachers to make money. One female respondent said:

"I own and operate two YouTube channels and have a page that I have taken professionally. I have posted what kind of work I do with kids on those platforms. I mostly concentrate on students' actions, such as when they record and post an English-language video talking about a certain topic." (Focused Group Discussion - Rajshahi).

The engaged and empowered teacher serves as a mentor to other educators on various approaches to embracing or incorporating technology in teaching in order to make it meaningful. I

enjoy working with computers, and I am prepared to do so. As an ICT trainer, I always try to share this enthusiasm with other teachers, make training enjoyable, and get everyone involved, including senior teachers who are bored or unmotivated (*Interview, In-depth-2*).

Being inspired, a lot of female teachers join and gradually gain access to e-learning platforms like Shikhhok Batayon, where they may take an active role in contributing by sharing original content, ideas, and blogs. To join, however, did not entail active participation. Many users simply logged in, visited the site, and looked at the information without producing any content, submitting any, or communicating with other users. Although not very engaged, they are assumed to have user abilities (*Interview, In-depth-3*).

The receiving position appears limited since active involvement calls for constant learning, the upgrading of skills and information, and the capacity to adapt to change in order to play an influencing role in society. Despite having the necessary abilities and motivation, many female teachers are unable to fully participate in the use of ICTs for a variety of reasons.

Increase online social network

In terms of professional development and lifelong learning for academic teachers and other things, social media and social networking sites are steadily gaining attention (Podorova et al., 2019). Online communities, which are networks of social connections, provide support, knowledge, and a sense of community where the physical location in activities has reduced (Mäkinen, 2006). Surfing social networking sites for communication, searching for information, or entertainment purposes is not enough for digital empowerment, rather how it is used is so important (Ellison, Nicole B., et al., 2011). In the professional sphere, significant difference has been observed in both genders though female teachers' participation is increasing in professional networking. Although female teachers are becoming more involved in social networking, there are still noticeable differences between the sexes in the professional realm.

Table 4. Accessing social networks by gender in professional front

	Hours per week (in percentage point)				
		Never	Less than 3	3 to 5	Above 5
Use social networking sites to share teaching materials, ideas, seek support for academic issue with each other through internet	Male	35.7	41.5	18.7	4.1
	Female	52.3	38.7	7.1	1.9
Collaborate with students through social media	Male	70.2	24.6	4.1	1.2
	Female	79.4	18.7	0.6	1.3

Source: Field data 2019

According to the data presented in Table 4, half of the female teachers do not participate in social media or networking sites on a professional level. The results demonstrate that most teachers (41.5% of men and 38.7% of women) typically spend little time on social networking sites; logging in for less than three hours per week. However, social media collaboration with students is still rather uncommon. However, some educators use social media to integrate technology into their classes. Create a Facebook page and add all of the students enrolled in the class as members to encourage extracurricular activities alongside academic pursuits. Being well-versed in social media can allow us to understand students and their generation better (*Interview, In-depth-1*).

A sizable number of teachers are signing up to join Shikhhok Batayon, the largest and most popular teachers' portal. It is such a platform that all levels of teachers (primary, secondary, madrasa, vocational, and college) can interact and collaborate on it. Several online platforms, including Durbar, Microsoft Educator, Kishore Batayan, Muktapath, and Shikhhok Batayon, are

where I currently participate. With the assistance of several co-workers via Facebook, learn how to join a portal, publish content, and write blogs (Interview, In-depth-1).

Through social networking, online communities work as a network of social relationships that offer support, information, and a feeling of belonging, which is indeed a fundamental aspect of developing a strong professional identity and furthering professional development (Bodell & Hook, 2011). A participant remarked:

"In the area of professional bonding, Teachers' Batayan is contributing significantly. We exchange different teaching materials with each other. If a family member needs treatment for medical reasons, we, a Batayan family of teachers, offer financial support to meet medical expenses as well." (Focused Group Discussion- Dhaka)

In so far as they enable coordination and cooperation for mutual advantages, such as the exchange of resources, personal and professional relationships, and consequences for psychological well-being, social networking sites may serve multiple forms of social capital, including bridging and bonding (Ellison, & Lampe, 2011). Social networking sites work as a powerful source of inspiration for educators which does not always come from within the four walls of the school. Shikkhok Batayon, Shikkhok Batayon Facebook group—these se online platforms have served as a source of inspiration. An ICT4e ambassador's statement:

"Whenever I upload content, I write a blog to get feedback from experts in the sector with whom I am only connected virtually. Experts from different parts of the country give me various opinions on my content and suggest areas for improvement, and I try to improve accordingly. All these online platforms give recognition to my work, and by doing so I am more inspired." (Interview, In-depth-3).

From this point of view, online help and advice are positively valued because they can allow teachers to share knowledge and information, detect professional problems, and seek alternatives, as well as motivate them to make changes and improve educational practice. The research shows that teachers frequently self-learn, preferring trial-and-error learning, and when they need assistance, they turn to the Internet or informal peer consultation (Podorova et al., 2019).

Self confidence

Increasing self-confidence has been identified as a vital area in digital gender inclusion and empowerment according to digital literacy or skills development (Huyer, Sophia, and Sikoska, 2003). Developing a sense of individual confidence and capacity, which is also seen in terms of self-reliance and internal strength, is at the heart of empowerment (Moser, 2012). After involving themselves in any training or seminar, many of the female teachers who felt a lack of confidence and fear of computer anxiety due to a lack of abilities to operate computers and related digital mediums have found personal empowerment through the process of change they go through when they learn new skills. They feel a considerable change in self-confidence. A participant who had gone through similar transformations said:

"When not training, I had a feeling that I might not be able to use a laptop, projector, or computer. That's why I used to avoid IT-related work. But after taking training, I got confident that I would be able to take the multimedia class and manage the session by taking the students directly to the lab. After that, the fear and uneasiness left me." (Interview, In-depth-2).

Another participant expressed greater feelings about her internal strength:

"The ICT training gave me confidence in the computing and technological field, and it gives me confidence in what I do and what I can do." (Interview, In-depth-1).

In the above statements, respondents demonstrate their empowerment by developing a sense of self and individual confidence and capacities.

Pedagogical change

Several studies cite female teachers' lower level of computer use on a personal level and link this lower level of integration of ICTs into their teaching practice to anxiety, a lack of confidence, and competence (Gebhardt et al., 2019). However, female teachers, who are especially affected by traditional forms of teaching and learning, are motivated to use ICTs when they are involved in the acquisition of skills and knowledge. The study found that many changes have come to teaching methods. The steps involved in pedagogy, such as connecting with prior knowledge, lesson announcement, and group or pair work implementing these things, are not practiced at the field level at all in the lecture method. Through the use of ICT, pedagogical steps in teaching and learning can be applied effectively. One of the ICT teachers (a female) stated:

"How the steps will be presented, which steps are used first so that children can understand, and keeping in mind all those things, a PowerPoint presentation is created and displayed on the slide so that the learning outcome will be achieved. Many of us who used to take classes this way using ICT were a laughingstock to others. But over time, people who used to ignore us later came to us to learn about the techniques of making these slides." (Focused Group Discussion -Dhaka).

This suggests that the use of ICTs makes the learning more relevant, in contrast to memorization-based or rote learning, which is the feature of traditional pedagogy. ICT-enhanced learning promotes increased learner engagement. A significant change happens in teachers' roles as they become more participatory and leave the traditional lecture-type lesson aside. A teacher commented on:

"I can make children able to use computers, building capacity among them so they are engaged in the teaching-learning process. The use of course materials as varied as videos, websites, graphics, and games makes traditional subjects more interesting." (Interview, In-depth-1).

By using modern teaching applications, teachers are gradually improving themselves. A shortage of skilled teachers' makes it important to use technology in a professional context since it requires extensive knowledge of ICTs. Indeed, teachers formally know about video editing, illustration, and graphic design from advanced ICT training, where female teachers' participation is very poor. However, the number of female teachers using computers, the internet, and other devices in their teaching context is increasing, mostly in developed countries (Gebhardt et al., 2019).

CONCLUSION

The study investigates digital empowerment in its four components among female secondary school teachers: awareness, motivation, technical access, and digital competence. Although it is not statistically possible to generalize, the findings obtained from the subjects give important clues that female teachers' digital empowerment is unsatisfactory. A significant gender difference is observed in the motivation and competence aspects, but not in awareness or technical access (internet), despite the fact that a large number of teachers of both sexes do not have home access to computers. Despite having infrastructural access at their institution (external factors) there is a significant lack of endogenous motivation among female teachers. Endogenous motivation is closely related to self-confidence as well as the skills and capabilities necessary to use information and communication technologies. Female teachers significantly lack confidence in doing some specific computer applications, and the most frequent reason behind this is inadequate skills and a lack of developing digital agency, which is vital to becoming digitally empowered. A new form of inequality is created where a disparity has been observed in strategic skills, involvement in online professional networking societies, and creative users. Inequality in its old mode, which was a lack of material access, seems to have disappeared. This study also explored the feeling of empowerment through certain positive transformations that occurred as people acquired knowledge, skills, and the ability to engage with technology. Professional capabilities, self-

confidence, and pedagogy are the three categories of transformation. The acquisition of digital competence leads to the development of professional competencies. Many female instructors who have received ICT training have improved their ICT skills, such as designing their own web pages, using various Microsoft Office software, and creating multimedia content. Training, in addition to enhancing competence, can enhance intrinsic motivation, which is a prerequisite for becoming digital. Despite their refusal to receive ICT training during the training time, they were found to be active and enthusiastic to learn. As a result, participants are emotionally engaged in learning ICTs, paying high attention, which increases their technological work engagement. Participating in various online teacher portals, uploading content, and changing their status from consumers to producers reveals their digital agency. In a pedagogical context, the study found that pedagogical stages in teaching and learning can be effectively implemented through the use of ICT, which is not possible with the lecture method. In addition, teachers' duties change significantly as they become more participatory and leave the traditional lecture-style lesson.

LIMITATIONS

In this study, all survey respondents resided in urban areas and were secondary school teachers who were also members of an official online teachers' portal. However, not all teachers were included on this portal. In the future, another researcher should plan to investigate the digital divide by gender with larger and more diverse samples from rural areas and other levels of teachers (elementary, college, madrasa) across the nation. The survey collected the opinions of teachers regarding their digital skills. Self-reported surveys that have been used to assess various categories of digital skills (operational, strategic, and communications) may have several limitations, such as the respondent's unwillingness to admit incompetence in front of the researcher. Additionally, there may be excretion. Therefore, it does not objectively assess the digital skills of teachers. To objectively assess digital skills, a teacher must spend time conducting tests using a computer, software, and other equipment. Additionally, as previous research has demonstrated that equality policies enhance the legitimacy of organizations (Blanco-Gonzalez et al, 2023), similarly, future lines may explore the effect of digital empowerment on organizational legitimacy.

REFERENCES

- Acılar, A. (2011). Exploring the aspects of digital divide in a developing country. *Issues in Informing Science and Information Technology*, 8, 231-244. DOI:10.28945/1415
- Alazzam, A. O., Bakar, A. R., Hamzah, R., & Asimiran, S. (2012). Effects of Demographic Characteristics, Educational Background, and Supporting Factors on ICT Readiness of Technical and Vocational Teachers in Malaysia. *International Education Studies*, 5(6), 229-243. <http://dx.doi.org/10.5539/ies.v5n6p229>
- Antonio, A., & Tuffley, D. (2014). The gender digital divide in developing countries. *Future Internet*, 6(4), 673-687. <https://doi.org/10.3390/fi6040673>
- Avidov-Ungar, O. (2018). Empowerment among teachers in leadership positions involving ICT implementation in schools. *Leadership and Policy in Schools*, 17(1), 138-163. <https://doi.org/10.1080/15700763.2016.1270331>
- Awodiji, O. A., Oyedoyin, M. M., & Jantuah, S. K. (2022). Analysis Of Nigerian Lecturers'professional Development Programme Participation. *Journal of Management and Business Education*, 5(3), 213-230.
- Baden, S., & Oxaal, Z. (1997). Gender and empowerment: Definitions, approaches and implications for policy. BRIDGE Institute of development studies, Brighton, England, (40).

-
- BANBEIS, (2017). Bangladesh Education Statistics Report.
- Beena, M., & Mathur, M. (2012). Role of ICT education for women empowerment. *International Journal of Economics and Research*, 3(3), 164-172.
- Blanco-González, A., Díez-Martín, F., & Miotto, G. (2023). Achieving Legitimacy Through Gender Equality Policies. *SAGE Open*, 13(2). <https://doi.org/10.1177/21582440231172953>
- Cochran, W. G. (1977). *Sampling Techniques*: 3d Ed. Wiley.
- Cox, M.J., Preston, C., & Cox, K.(1999). What factors support or prevent teachers from using ICT in their classroom? Paper presented at the British Education Research Association Annual Conference, University of Sussex, Brighton,
- Díez-Martín, F., Miotto, G. & Del-Castillo-Feito, C. The intellectual structure of gender equality research in the business economics literature. *Rev Manag Sci* (2023). <https://doi.org/10.1007/s11846-023-00671-8>
- Eva, R. (2022). "A Study on the Factors Motivating Teachers in Using ICT in their Instruction at a Government College in Bangladesh." *Journal of Research & Method in Education*, 12, Issue 4 Ser. I 01-08. <https://www.iosrjournals.org/iosr-jrme/papers/Vol-12%20Issue-4/Ser-1/A1204010108.pdf>
- Ellison, N. B., Steinfield, C., & Lampe, C. (2011). Connection strategies: Social capital implications of Facebook-enabled communication practices. *New Media & Society*, 13(6), 873–892. <https://doi.org/10.1177/1461444810385389>
- Gebhardt, E., Thomson, S., Ainley, J., & Hillman, K. (2019). Teacher gender and ICT. In *Gender differences in computer and information literacy* (pp. 53-68). Springer, Cham. DOI:10.1007/978-3-030-26203-7_5
- Habibu, T. (2012). *A Study of Difficulties Faced by Teachers in Using ICT in Classroom Teaching-Learning in Technical and Higher Educational Institutions in Uganda* (Doctoral dissertation, Department of Technical and Vocational Education (TVE), Islamic University of Technology (IUT).
- Hargittai, E., & Shafer, S. (2006). Differences in actual and perceived online skills: The role of gender. *Social science quarterly*, 87(2), 432-448. <https://doi.org/10.1111/j.1540-6237.2006.00389.x>
- Hafkin, N., & Taggart, N. (2001). *Gender, information technology and developing countries*. Washington, DC Academy for Educational Development. <http://usaid.gov/wid/pubs/it01/htm>.
- Hasan, M. S. H. K. M., & Khan, M. S. H. (2013). Introducing ICT into teacher-training programs: Problems in Bangladesh. *Journal of Education and Practice*, 4(14), 79-85. https://www.researchgate.net/publication/274641690_Introducing_ICT_into_Teacher-Training_Programs_Problems_in_Bangladesh
- Ineke Buskens, "An Approach to Women Empowerment and ICT Projects reflection about Self and Social Change," accessed October 18, 2018, https://files.ifi.uzh.ch/hilty/t/Literature_by_RQs/RQ%20302/2016_Buskens_Approach_to_women_empowerm.
- Islahi, F. (2019). Exploring teacher attitude towards information technology with a gender perspective. *Contemporary educational technology*, 10(1), 37-54. <https://doi.org/10.30935/cet.512527>
- ITU (International Telecommunication Union) (2020). *Measuring Digital development, Facts and Figures: 2020*. <https://www.itu.int/en/ITU-D/Statistics/Documents/facts/FactsFigures2020.pdf>.
- Jackson, L. A., Ervin, K. S., Gardner, P. D., & Schmitt, N. (2001). Gender and the Internet: Women communicating and men searching. *Sex roles*, 44, 363-379. <https://doi.org/10.1023/A:1010937901821>
-

-
- Kennedy, T., Wellman, B., & Klement, K. (2003). Gendering the digital divide. *IT & Society*, 1(5), 72–96.
<http://homes.chass.utoronto.ca/~tkennedy/Courses/2P26/Kennedy%202003.pdf>
- Kler, S. (2014). ICT integration in teaching and learning: Empowerment of education with technology. *Issues and Ideas in Education*, 2(2), 255-271.
DOI:10.15415/iie.2014.22019
- Laudari, S., & Maher, D. (2019). Barriers to ICT use in EFL teacher education courses in Nepal: An activity theory perspective. *Journal of NELTA*, 24(1-2), 77-94. DOI: <https://doi.org/10.3126/nelta.v24i1-2.27681>
- Li, N., & Kirkup, G. (2007). Gender and cultural differences in Internet use: A study of China and the UK. *Computers & Education*, 48(2), 301-317.
<https://doi.org/10.1016/j.compedu.2005.01.007>
- Mäkinen, M. (2006). Digital empowerment as a process for enhancing citizens' participation. *E-learning and Digital Media*, 3(3), 381-395.
<https://doi.org/10.2304/elea.2006.3.3.38>
- Martinez and Reilly, (2003). "Empowering Women for Public Policy Advocacy: Looking behind the Internet to Enable Citizen Information System."
<https://trainingcentre.unwomen.org/instraw-library/2003-R-TEC-GLO.pdf>
- Moser, C. (2012). *Gender planning and development: Theory, practice and training*. Routledge.
- Mou, S. (2016). Possibilities and challenges of ICT integration in the Bangladesh education system. *Educational Technology*, 50-53.
<https://www.jstor.org/stable/44430461>
- Mumporeze, N., & Prieler, M. (2017). Gender digital divide in Rwanda: A qualitative analysis of socioeconomic factors. *Telematics and Informatics*, 34(7), 1285-1293.
- Muhwezi, I. (2023). Teachers' challenges affecting the implementation of the new business subjects' curriculum in selected secondary schools in Uganda. *Journal of Management and Business Education*, 6(2), 222-239. <https://doi.org/10.35564/jmbe.2023.0011>
- Organisation for Economic Co-operation and Development (OECD). (2018). *Bridging the digital gender divide: Include, upskill, innovate*.
- Passey, D., Shonfeld, M., Appleby, L., Judge, M., Saito, T., & Smits, A. (2018). Digital agency: Empowering equity in and through education. *Technology, Knowledge and Learning*, 23, 425-439. <https://doi.org/10.1007/s10758-018-9384-x>
- Philomina, M. J., & Amutha, S. (2016). Information and communication technology awareness among teacher educators. *International Journal of Information and Education Technology*, 6(8), 603. DOI:10.7763/IJiet.2016.V6.759
- Podorova, A., Irvine, S., Kilmister, M., Hewison, R., Janssen, A., Speziali, A., ... & McAlinden, M. (2019). An important, but neglected aspect of learning assistance in higher education: Exploring the digital learning capacity of academic language and learning practitioners. *Journal of University Teaching & Learning Practice*, 16(4), 3. <https://doi.org/10.53761/1.16.4.3>
- Prihatin, P. N. English teacher participants' engagement in online learning session of teaching profession certification program.
- Purushothaman, A. (2013). Empowering women through learning to use the internet-An ethnographic action research project to address the second order digital divide.
- Rio, H., & Newman, W. (2022). The Significance of Models of Continuous Professional Development Programmes in Promoting Quality Teaching and Learning in Schools. *African Perspectives of Research in Teaching & Learning (APORTAL)*, 6(1).
- Saha, S. R., & Zaman, M. O. (2017). Gender digital divide in higher education: a study on University of Barisal, Bangladesh. *Journal of Humanities and Social Science*, 22(01), 11-17. DOI:10.9790/0837-2201041117
-

-
- Schradie, J. (2015). The gendered digital production gap: Inequalities of affluence. In L. Robinson, S. R. Cotten, & J. Schulz (Eds.), *Communication and Information Technologies Annual, Studies in Media and Communications, Volume 9* (pp. 185-213). Emerald Group Publishing Limited.
- Schulz, R., Isabwe, G. M., & Reichert, F. (2015, September). Investigating teachers' motivation to use ICT tools in higher education. *Internet Technologies and Applications (ITA)* (pp. 62-67). IEEE. DOI:10.1109/ITechA.2015.7317371
- Soomro, K. A., Kale, U., Curtis, R., Akcaoglu, M., & Bernstein, M. (2020). Digital divide among higher education faculty. *International Journal of Educational Technology in Higher Education*, 17(1), 1-16. DOI:10.1186/s41239-020-00191-5
- Soltan, L. (2016). Digital divide: The technology gap between the rich and poor. Retrieved February, 26, 2016.
- Shrestha, S. A. G. U. N. (2018). ICT in education. *The Kathmandu post*, Retrieved from <https://kathmandupost.com/opinion/2018/11/07/ict-in-education>, Accessed: May, 20, 2020.
- Taddese, E. T., & Rao, C. (2021). School-based continuous professional development of teachers: a case study of primary school teachers in Ethiopia. *Education 3-13*, 0(0), 1-13. <https://doi.org/10.1080/03004279.2021.1929382>
- Terry, A., & Gomez, R. (2010). Gender and public access computing: An international perspective. *The Electronic Journal of Information Systems in Developing Countries*, 43(1), 1-17. DOI:10.1109/HICSS.2011.211
- Tyers, A. (2012). A Gender Digital Divide? Women Learning English through ICTs in Bangladesh. In *mLearn* (pp. 94-100). https://ceur-ws.org/Vol-955/papers/paper_16.pdf
- Van Dijk, J. A. (2012). The evolution of the digital divide-the digital divide turns to inequality of skills and usage. *Digital enlightenment yearbook 2012* (pp. 57-75). IOS Press.
- Van Dijk, J. A. G. M. (2002). A framework for digital divide research. *Electronic Journal of Communication*, 12(1),2. <http://www.cios.org/EJCPUBLIC/012/1/01211.html>
- World Economic Forum, (2022). How to unlock women's potential in the digital economy. <https://www.weforum.org/agenda/2023/04/why-global-leaders-must-make-green-investments-make-business-sense-at-the-world-bank-spring-meetings/>
- Webb, D. A., & Buskens, D. I. (Eds.). (2014). *Women and ICT in Africa and the Middle East: Changing selves, changing societies*. Bloomsbury Publishing.
- Zaman, H., & Uzzaman, R. (2015). Achieving digital Bangladesh by 2021 and beyond. Background paper for the 7th Five Year Plan (7FYP). http://www.plancomm.gov.bd/wp-content/uploads/2015/02/18_Achieving-Digital-Bangladesh-by-2021-and-Beyond.pdf.
- ZebunnesaLaizu, Jocelyn Armarego, and Fay Sudweeks, "The Role of ICT in Women's Empowerment in Rural Bangladesh" *Proceeding Cultural Attitudes Towards Communication and Technology*(16 January 2015):228, accessed on October 2, 2018, <http://www.Researchget.net/publications/268259843>.

DECLARATION OF CONFLICTING INTERESTS

The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.