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RESEARCH ARTICLE

Gender Mainstreaming in ICT Education: Exploring Teachers' Competence in Selected Academic Institutions in Masbate, Philippines

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ABSTRACT

This study examines ICT competence among teachers in Masbate, focusing on gender disparities. It aims to explore how gender influences ICT skills, assess the impact of gender mainstreaming initiatives, identify barriers to ICT development, and propose recommendations to address gender gaps. Using a descriptive research design, the study analyzes ICT competence across six dimensions: information and data literacy, communication and collaboration, digital content creation, safety and security, problem-solving, and reflection. Data were collected via a 42-item survey and the Higher Education Gender Mainstreaming and Development Guidelines (HGDG) from 41 teachers in public and private academic institutions. Findings reveal that male teachers excel in advanced ICT skills, including complex searches and cloud-based storage management. In contrast, female teachers show strengths in foundational competencies, such as digital content creation and copyright compliance. Both genders perform well in basic ICT functions but exhibit disparities in advanced skills. Weighted mean calculations and thematic analysis highlight barriers to ICT development, such as limited access to resources and training. The study concludes that while gender mainstreaming efforts have improved ICT competence, further targeted training is necessary to close specific skill gaps. Professional development programs should prioritize advanced digital skills for female teachers while maintaining strengths across genders. These findings emphasize the importance of promoting gender equity in ICT competence and equipping educators with the skills needed to thrive in technology-driven educational environments. Recommendations include developing comprehensive, gender-sensitive training strategies to support teachers in adapting to the evolving demands of education.

INTRODUCTION

Integrating gender perspectives in education, particularly in Information and Communication Technology (ICT), is a global concern for policymakers and educators. ICT is recognized as a driver of economic growth and societal development, but gender disparities in this field persist, with women and girls underrepresented in education and the workforce. This imbalance limits their potential contributions and perpetuates broader inequalities. Gender mainstreaming strategies have been introduced to address these issues, embedding gender-sensitive approaches into policies, curricula, and teaching practices. These initiatives aim to create inclusive learning environments and dismantle barriers that have historically excluded women and girls from ICT education and careers.

Digital technologies, when effectively integrated into education, play a transformative role in promoting gender inclusion. Mejía-Salazar et al. (2023) demonstrated their positive impact on female students across various contexts. However, challenges remain in implementing consistent and impactful gender mainstreaming strategies (Bamezai et al., 2020). Kurti et al. (2024) emphasized the importance of creating programs that attract and support women in ICT education, while Liang et al. (2022) highlighted how ICT-enabled learning enhances educational inclusiveness for schoolgirls in Asia, helping them overcome traditional barriers.

In the Asian context, ICT has been linked to increased female workforce participation (Duwal & Silwal, 2024). However, the complexities of mobile phone usage reveal the need for nuanced ICT policies. Bala and Khan (2022) identified ICT as pivotal in creating flexible work environments and fostering leadership opportunities, empowering women in the labor market. Zander and Hussain (2015) further illustrated how women's ICT programs in South Asia empower participants personally and within their communities, advancing gender equality.

In the Philippines, the integration of gender perspectives in education, including ICT, remains an ongoing challenge. Tarrayo (2021) noted that while gender dimensions are increasingly acknowledged, their practical implementation often lacks clarity. Teacher competency plays a vital role in this integration. Dela Fuente and Biñas (2020) assessed the ICT skills of secondary school teachers in the Philippines, finding intermediate competence levels but a strong need for ongoing professional development. Similarly, Araiz (2018) highlighted the limited proficiency of ICT coordinators in Davao del Sur, stressing the need for comprehensive training to elevate their standards and support gender mainstreaming initiatives.

Tarrayo, Potestades, and Ulla (2021) explored gender perspectives in English Language Teaching (ELT) in Philippine higher education. They found that while teachers recognized the benefits of gender-inclusive education, such as fostering critical thinking and supportive environments, they faced challenges like learner diversity and institutional constraints. These insights are crucial for understanding similar obstacles in ICT education.

Gender Disparity in ICT Education

While ICT has the potential to be a great equalizer, research has consistently revealed a gender gap in ICT access, use, and competence (UNESCO, 2019). Women and girls are often underrepresented in ICT-related fields, and this disparity extends to the teaching profession. This gender bias can have far-reaching implications for educational equity and opportunities for female students. Despite the transformative potential of ICT, the digital divide persists, with women and girls disproportionately affected. This gender gap manifests in various forms, including unequal access to technology, limited opportunities for ICT-related education, and underrepresentation in ICT-dominated fields (UNESCO, 2019). The education sector is not immune to this disparity, with female teachers often facing barriers to acquiring and effectively utilizing ICT skills. Addressing the gender gap in ICT education is not merely a matter of equity but a strategic imperative. Studies have shown that empowering women and girls through ICT can contribute to economic growth, social development, and democratic participation (UN Women, 2022). By closing the gender gap in ICT education, we can create a more equitable and inclusive society.

To address this issue, the concept of gender mainstreaming has gained prominence. This approach involves integrating gender perspectives into all policies, programs, and activities to ensure that both women and men benefit equally. By applying gender mainstreaming to ICT education, it is possible to identify and challenge gender-based inequalities and create a more inclusive learning environment. Like many developing countries, the Philippines has made significant steps in ICT infrastructure development. However, challenges persist regarding equitable access and utilization

of ICT, especially in rural areas and among marginalized groups. Studies have shown that gender disparities in ICT access and use are prevalent in the Philippines (National Statistics Office, 2018). Given the critical role of teachers in bridging the digital divide, it is imperative to investigate the ICT competence of teachers in the Philippines, particularly with a focus on gender differences. By examining the factors that influence teachers' ICT competence and identifying the barriers faced by female teachers, this study aims to contribute to developing targeted interventions to promote gender equality in ICT education.

The Philippines has made substantial progress in ICT infrastructure development, increasing internet penetration and mobile phone ownership. However, disparities in access and use persist, particularly in rural areas and among marginalized groups (National Statistics Office, 2018). While the government has implemented various ICT initiatives in education, the extent to which these efforts have addressed gender gaps remains unclear. Gender mainstreaming offers a promising approach to addressing gender disparities in ICT education. This strategy involves integrating a gender perspective into all policies, programs, and activities to ensure that both women and men benefit equally. By applying this framework, it is possible to identify and challenge gender-based inequalities and to design interventions that specifically target the needs of female educators. While existing research has explored ICT competence among teachers and gender disparities in ICT access, there is a paucity of studies explicitly examining gender differences in ICT competence among teachers in the Philippines. This study aims to fill this gap by investigating the level of ICT competence among male and female teachers in selected academic institutions in Masbate, analyzing the impact of gender mainstreaming initiatives, and identifying barriers to ICT skill acquisition.

This study aims to contribute to the body of knowledge by examining teachers' competencies in ICT education, assessing their ability to implement gender-sensitive approaches, and building a more inclusive and equitable ICT environment in the academe. By understanding the specific challenges teachers face in Masbate, this research can inform the development of targeted interventions to enhance their ICT competence and contribute to the broader goal of gender equality in education.

Objectives of the Study

The study aims to explore ICT competence among teachers in selected academic institutions in Masbate. It examines gender differences, evaluates the impact of gender mainstreaming initiatives, identifies barriers, and develops policy recommendations or training programs to address gender disparities and was guided by the following specific research objectives:

1. To assess the level of ICT competence among teachers in selected academic institutions in Masbate with a focus on gender differences.
2. To analyze the contribution of gender mainstreaming initiatives on enhancing ICT competence among teachers.
3. To identify the barriers male and female teachers face in acquiring ICT skills in their education practices.
4. To develop recommendations or training programs that address gender disparities in ICT competence among teachers.

RESEARCH METHODOLOGY

This study employed a descriptive research design to assess the ICT competence of male and female teachers using a survey questionnaire. According to Singh (2013), descriptive research focuses on understanding the status of a phenomenon, while Calderon (2006, as cited in Rillo & Alito, 2018) emphasized its role in collecting, tabulating, analyzing, and interpreting data. The study assessed respondents' competence in six ICT dimensions: information and data literacy, communication and collaboration, digital content creation, safety and security, problem-solving, and analyzing and reflecting.

The primary instrument was a survey questionnaire comprising teachers' profiles and ICT competence, based on the 42-item Basic ICT Competence Scale (BICS) developed by Al-Khateeb (2017) and Rubach & Lazarides (2021). Responses were measured using a five-point Likert scale, with Cronbach alpha values of 0.913 (Al-Khateeb, 2017) and 0.86 (Hero et al., 2021) validating the instrument's reliability. Additionally, the HGDG checklist was used to assess the impact of gender mainstreaming initiatives, while an interview guide was administered to explore barriers in acquiring ICT skills.

Respondents included 41 primary and higher education teachers (21 male, 20 female) from public and private institutions in the City Schools Division of Masbate and the Schools Division of Masbate Province. Stratified random sampling was implemented, with sample sizes determined using Cochran's formula. Data were gathered through face-to-face surveys and Google Forms to accommodate geographic and logistical constraints. A research approval letter ensured compliance with the Data Privacy Act of 2012, and instruments were validated through expert panel review.

Data analysis employed weighted mean and standard deviation to assess ICT competence and variability between genders. The HGDG was used to evaluate gender mainstreaming contributions, while inductive thematic analysis (Braun & Clarke, 2021) identified barriers to ICT skills acquisition. This approach ensured themes emerged organically, providing a robust exploration of challenges and opportunities in integrating ICT competence into gender-sensitive educational practices.

RESULTS

Level of Information and Communication Technology Competence Across Genders

The data presented in Table 1 compares the ICT competence of male and female teachers concerning Information and Data Literacy. The results indicate that male teachers demonstrate a higher level of digital competence than female teachers, with an overall mean score of 4.27, classified as Very High Competence, compared to the 3.79 High Competence score for female teachers. Despite this difference, both genders are proficient in various aspects of information literacy, though some notable distinctions arise.

Regarding search engine use, male and female teachers performed equally well, obtaining a mean score of 4.32, reflecting Very High Competence. This suggests that the ability to use search engines to find information is well-developed across both genders, likely due to the familiarity and frequency with which these tools are used in everyday life. Such a finding showed that basic information retrieval skills are already well-mastered for both groups. However, differences emerge in other competencies, particularly in saving and storing information. Male teachers scored slightly higher in the ability to store and retrieve files, with a mean of 3.67 compared to 3.55 for females, although both scores indicate High Competence. This difference extends to using cloud storage services and saving information in different formats, where male teachers outperformed female teachers, though only marginally. The results suggest that, while both male and female teachers are proficient in these areas, there may be a need for enhanced focus on cloud technology and file management practices, especially for female teachers, given the growing importance of these tools in educational settings.

Table 1. ICT Literacy: Pre-service Teachers in Masbate

Competency Indicators	Gender	Mean	Verbal Interpretation
I can use different search engines to find information.	Male	4.32	Very High Competence
	Female	4.32	Very High Competence
I can look for information online using a search engine.	Male	4.22	Very High Competence

	Female	4.22	Very High Competence
I can save or store files or content and retrieve them once saved or stored.	Male	3.67	High Competence
	Female	3.55	High Competence
I can save information found on the internet in different formats and use cloud information storage services.	Male	3.48	High Competence
	Female	3.40	High Competence
I can use advanced search strategies to find reliable information on the internet such as using web feeds.	Male	3.52	High Competence
	Female	3.25	Moderate Competence
I classify the information in a methodical way using folders and backups of information or files I have stored.	Male	4.14	High Competence
	Female	4.05	High Competence
I use some filters when searching to compare and assess the reliability of the information I find.	Male	3.81	High Competence
	Female	3.75	High Competence
I can assess the validity and credibility of information using a range of criteria.	Male	3.90	High Competence
	Female	3.80	High Competence
Overall Interpretation	**Male**	**4.27**	**Very High Competence**
	Female	**3.79**	**High Competence**

The data in Table 2 presents the ICT competence of male and female teachers in Communication and Collaboration. The results show that male and female teachers exhibit High Competence in using various communication and collaboration tools, with male teachers scoring an overall mean of 4.09, slightly higher than the 3.89 mean for female teachers. This indicates that both groups are generally proficient in the digital communication tools essential for modern teaching, though there are subtle differences in their levels of expertise across specific competencies.

One of the key findings is that both male and female teachers demonstrate Very High Competence in using essential communication tools, such as Skype, email, and voice messaging, with male teachers scoring 4.38 and female teachers closely behind at 4.25. This shows that the essential skills for online communication are well-developed in both groups, likely reflecting the integration of these tools into everyday professional and personal interactions. However, when it comes to more advanced features of communication tools, such as those found in platforms like Skype, Zoom, and Google Meet, a slight gender gap emerges. Male teachers scored 4.24 in this area, categorized as Very High Competence, whereas female teachers scored 4.10, indicating High Competence. This difference suggests that male teachers may be more comfortable or familiar with the advanced functionalities of these tools, which are increasingly crucial in online teaching environments.

Table 2. ICT Competence of Male and Female along Communication and Collaboration

Competency Indicators	Gender	Mean	Verbal Interpretation
I can communicate with others using Skype or chat –using basic features (e.g. emails, voice messaging, SMS, text exchange).	Male	4.38	Very High Competence
	Female	4.25	Very High Competence
I can use advanced features of several communication tools (e.g. Skype, Zoom, Google Meet and sharing files).	Male	4.24	Very High Competence
	Female	4.10	High Competence
I can actively use a wide range of communication tools (email, chat, SMS, instant messaging, blogs, micro-blogs, social networks) for online communication	Male	4.29	Very High Competence
	Female	4.10	High Competence
	Male	4.05	High Competence

I can use collaboration tools and contribute to e.g. shared documents/files someone else has created.	Female	3.95	High Competence
I can create and manage content with collaboration tools (e.g. project management systems, online spreadsheets).	Male	3.95	High Competence
	Female	3.75	High Competence
I can use advanced features of communication tools (e.g. video conferencing, data sharing, application sharing)	Male	3.81	High Competence
	Female	3.40	Moderate Competence
I can use online services (e.g., e-banking, e-governments, e-hospitals...etc.).	Male	3.90	High Competence
	Female	3.65	High Competence
Overall Interpretation	**Male**	**4.09**	**High Competence**
	Female	**3.89**	**High Competence**

Similarly, when asked about their ability to actively use a wide range of communication tools, including email, instant messaging, and social networks, male teachers again outperformed female teachers, with a mean score of 4.29 compared to 4.10. While both scores indicate a high level of competence, the data suggests that male teachers may engage more frequently or effectively with these platforms. Female teachers' slightly lower competence level might indicate a need for further professional development in utilizing these tools more extensively, particularly in collaborative or interactive teaching settings.

Table 3. ICT Competence of Male and Female Teachers Along Digital Content Creation

Competency Indicators	Gender	Mean	Verbal Interpretation
I can produce straightforward digital content (e.g. text, tables, images, audio files) in at least one format using digital tools.	Male	4.10	High Competence
	Female	3.95	High Competence
I know that content can be covered by copyright	Male	3.62	High Competence
	Female	3.50	High Competence
I can apply basic formatting (e.g. insert footnotes, charts, tables) to the content I or others have produced.	Male	3.95	High Competence
	Female	3.90	High Competence
I can make basic editing to content produced by others (e.g., adding and deleting).	Male	4.00	High Competence
	Female	3.90	High Competence
I know how to reference and reuse content covered by copyright.	Male	3.38	High Competence
	Female	3.50	High Competence
I can produce complex digital content in different formats (e.g. text, tables, images, audio files). I can use tools for creating webpages or blogs.	Male	3.86	High Competence
	Female	3.85	High Competence
I can use advanced formatting functions of different tools (e.g. mail merge, merging documents of different formats, using advanced formulas, macros). I can produce simple digital content (e.g. text, tables, images, audio files) in at least one format using digital tools.	Male	3.48	High Competence
	Female	3.50	High Competence
Overall Interpretation	**Male**	**3.77**	**High Competence**
	Female	**3.72**	**High Competence**

Presented in Table 3 the ICT competence of male and female teachers in the domain of Digital Content Creation. Both male and female teachers show High Competence, with male teachers scoring an overall mean of 3.77 and female teachers closely following with 3.72. These findings suggest that both groups are capable of creating digital content using various tools and formats, but subtle differences in their performance on specific competencies reveal areas for further development.

Both male and female teachers exhibit High Competence in producing simple digital content such as text, tables, images, and audio files. Male teachers scored 4.10, while female teachers scored slightly lower at 3.95. This suggests that while both groups are proficient in basic content creation, male teachers may have more confidence or experience producing such content. However, the difference is insignificant, indicating that both genders are comfortable with foundational content-creation tasks. Regarding understanding copyright issues, both male and female teachers show High

Competence, though male teachers scored 3.62 compared to 3.50 for female teachers. This suggests that both groups are aware of the importance of copyright, but there may be a need for further education on how to navigate intellectual property in the digital realm, especially given the growing emphasis on ethical digital content usage in educational settings.

When it comes to applying basic formatting functions, such as inserting footnotes, charts, and tables, male and female teachers perform similarly, with male teachers scoring 3.95 and female teachers 3.90. This consistency suggests that both genders are proficient in organizing and presenting digital content in a more structured and professional manner. Similarly, when asked about their ability to edit content produced by others, male teachers scored slightly higher at 4.00, while female teachers scored 3.90, both reflecting High Competence. This indicates that teachers, regardless of gender, can make adjustments and refinements to digital materials created by others, which is a valuable skill in collaborative educational environments.

Table 4. ICT Competence of Male and Female Teachers Along Safety and Security

Competency Indicators	Gender	Mean	Verbal Interpretation
I can take basic steps to protect my devices (e.g. using anti-viruses and passwords).	Male	4.43	Very High Competence
	Female	4.50	Very High Competence
I have an informed stance on the impact of digital technologies on everyday life and the environment.	Male	3.71	High Competence
	Female	3.55	High Competence
I take basic measures and actions to save energy.	Male	4.05	High Competence
	Female	4.20	High Competence
I know how to react if my computer is infected by a virus. I can configure or modify the firewall and security settings of my digital devices.	Male	4.00	High Competence
	Female	4.10	High Competence
I understand the positive and negative impact of technology on the environment.	Male	4.00	High Competence
	Female	4.10	High Competence
I understand the health risks associated with the use of digital technology (e.g., risk of addiction).	Male	3.95	High Competence
	Female	4.05	High Competence
I am aware that my credentials (username/password) can be stolen. I know I should not reveal private information online.	Male	4.00	High Competence
	Female	4.15	High Competence
Overall Interpretation	**Male**	**4.02**	**High Competence**
	Female	**4.09**	**High Competence**

The study reveals that male and female teachers possess high levels of ICT competence in safety and security (see Table 4), with female teachers slightly outperforming their male counterparts. The mean score for male teachers is 4.02, and for female teachers, it is 4.09, both categorized under "High Competence." This suggests that both groups are highly capable of visiting the digital environment in terms of safeguarding their devices and personal information and understanding broader security issues. While the difference between genders is small, the slight edge female teachers hold in several key areas suggests a trend towards stronger engagement with digital safety measures.

The data reveals that female teachers showed a higher level of competence in protecting devices using antivirus software and passwords, with a mean score of 4.50, compared to males at 4.43. This falls under "Very High Competence" for both genders, but the marginal difference indicates that female teachers may be more diligent in implementing these fundamental protective measures. Similarly, when it comes to saving energy while using technology, female teachers scored higher (4.20) than male teachers (4.05), suggesting that they might be more conscious of energy-saving practices, an essential factor in sustainability and long-term digital device management. When confronted about the awareness of online credential security, which includes understanding that usernames and passwords can be stolen and recognizing the importance of not sharing private

information online, female teachers again outscored their male counterparts, with a mean score of 4.15 compared to 4.00. This slight difference implies that female teachers may be slightly more attuned to privacy and data protection, crucial skills in an increasingly digital world where cyberattacks and identity theft are on the rise. It can be gleaned that both scores, however, reflect "High Competence," indicating that both genders are generally well-prepared in this dimension.

Table 5. ICT Competence of Male and Female Teachers Along Problem Solving

Competency Indicators	Gender	Mean	Verbal Interpretation
I am aware that I need to update my digital skills regularly.	Male	3.86	High Competence
	Female	3.55	High Competence
I frequently update my digital skills to decrease my limits and increase my digital knowledge.	Male	3.43	High Competence
	Female	3.25	Moderate Competence
I find support when a technical problem occurs or when using a new program.	Male	3.48	High Competence
	Female	3.25	Moderate Competence
I regularly update my digital skills. I am aware of my limits and try to fill my gaps.	Male	3.24	Moderate Competence
	Female	3.30	Moderate Competence
I am aware of new technological developments. I understand how new tools work.	Male	3.67	High Competence
	Female	3.25	Moderate Competence
I can solve most of the more frequent problems that arise when using digital technologies.	Male	3.81	High Competence
	Female	4.15	High Competence
I can frequently choose the right tool, device, application, software or service to solve (non-technical) problems.	Male	3.62	High Competence
	Female	3.75	High Competence
I can solve technological problems by exploring the settings and options of programmes or tools.	Male	3.67	High Competence
	Female	3.75	High Competence
Overall Interpretation	**Male**	**3.60**	**High Competence**
	Female	**3.53**	**High Competence**

The results on ICT competence related to problem-solving are presented in Table 5, which reveals distinct patterns between male and female teachers. Both genders exhibit high overall competence, with male teachers achieving a mean score of 3.60 and female teachers slightly lower at 3.53. Despite this, there are notable differences in their specific competencies and how they approach updating and addressing technological challenges.

Male teachers score higher on average in terms of awareness and updating digital skills. For example, male teachers reported a mean score of 3.86 for being aware of the need to update their digital skills regularly, compared to female teachers at 3.55. Similarly, male teachers scored 3.43 for frequently updating their skills, while female teachers scored lower at 3.25. These scores suggest that male teachers might be slightly more proactive in recognizing the importance of regular skill updates and actively engaging in skill improvement. However, female teachers exhibit higher competence in solving frequent technological problems, with a mean score of 4.15, compared to male teachers at 3.81. This indicates that while male teachers may be more aware of the need for ongoing skill development, female teachers are more adept at handling common technical issues. This ability to solve problems efficiently could be attributed to practical experience or more effective problem-solving strategies.

It is also evident that both genders show high competence in finding support and exploring new tools, though female teachers score slightly lower on some indicators. For instance, the mean score for female teachers in finding support during technical issues is 3.25, compared to 3.48 for male teachers. Similarly, female teachers scored 3.25 in their awareness of new technological developments, while

male teachers scored 3.67. These lower scores for female teachers in support-seeking and awareness of new tools suggest fewer resources or less frequent engagement with emerging technologies. Despite these differences, both male and female teachers demonstrate comparable levels of competence in selecting appropriate tools and solving problems by exploring settings and options. Both genders scored around 3.75 in these areas, indicating a solid ability to address non-technical problems and navigate digital tools effectively.

Table 6. ICT Competence of Male and Female Teachers Along Analyzing and Reflecting

Competency Indicators	Gender	Mean	Verbal Interpretation
I can analyze the effect of media in digital environments.	Male	3.76	High Competence
	Female	4.15	High Competence
I can evaluate interest-driven dissemination and the dominance of topics in digital space.	Male	3.62	High Competence
	Female	3.80	High Competence
I can reflect on the opportunities and risks of media use for my media use.	Male	3.67	High Competence
	Female	3.95	High Competence
I can analyze the benefits of business activities and services in digital environments.	Male	3.81	High Competence
	Female	3.65	High Competence
I can analyze business activities and service risks in the digital space.	Male	3.67	High Competence
	Female	3.55	High Competence
Overall Interpretation	**Male**	**3.70**	**High Competence**
	Female	**3.82**	**High Competence**

The results from Table 6 on ICT competence related to analyzing and reflecting show that both male and female teachers exhibit high levels of competence, with female teachers scoring slightly higher overall. The mean score for male teachers is 3.70, while female teachers have an average score of 3.82. This indicates a generally high ability to analyze and reflect on various aspects of digital environments, though female teachers tend to outperform their male counterparts in most specific areas.

When it comes to analyzing the effect of media in digital environments, female teachers scored 4.15, compared to male teachers at 3.76. This suggests that female teachers are more adept at understanding the influence of media in digital spaces, reflecting a more grasp of media impact. Female teachers scored higher in evaluating interest-driven dissemination and the dominance of topics online, with a mean of 3.80, compared to 3.62 for male teachers. This difference indicates that female teachers might be more skilled at discerning trends and topic prominence in digital media.

In reflecting on the opportunities and risks of media use, female teachers again showed a higher level of competence, with a mean score of 3.95 compared to 3.67 for male teachers. This suggests that female teachers might be more adept at critically assessing the benefits and potential downsides of media use. Despite this, male teachers scored higher in analyzing the benefits of business activities and services in digital environments, with a mean of 3.81, while female teachers scored slightly lower at 3.65. This indicates that male teachers may better understand the positive aspects of digital business activities. Regarding the analysis of business activities and service risks in the digital space, female teachers had a mean score of 3.55, while male teachers scored 3.67. This reflects a slightly higher competence among male teachers in identifying risks associated with digital business activities. Despite these minor differences, both genders demonstrate high competence across all indicators, reflecting a solid ability to analyze and reflect on digital environments.

Contribution to Gender Mainstreaming Initiative in

Developing ICT Competence

The evaluation of the Gender and Development (GAD) mainstreaming initiative on teachers' ICT competence (see Table 8) reveals that the project falls within the "gender-sensitive" category, with a total GAD score of 13.78. This indicates that while gender concerns have been incorporated into the project, there are areas where improvements are needed to achieve a more gender-responsive approach. The initiative acknowledges gender issues but lacks full integration of gender equity principles in its implementation.

In the project identification phase, there is a fair balance in the participation of both women and men, as reflected by the score of 2.0. However, the collection of sex-disaggregated data and gender-related information prior to project design is notably weak, with a score of 1.0, and the conduct of gender analysis is even lower at 0.85. These low scores suggest that the project did not fully capture the specific gender-related needs before implementation, which may have affected its ability to address gender disparities effectively.

GAD Dimension and Question	Score for the item / element
Project Identification	
Participation of women and men in project identification	2.0
Collection of sex-disaggregated data and gender-related information Prior to the project design	1.0
Conduct of gender analysis and identification of gender issues	0.85
Project Design	
Gender equity goals, outcomes, and outputs	2.0
Matching of strategies with gender issues	1.0
Gender analysis of the designed project	1.76
Monitoring targets and indicators	1.0
Sex-disaggregated database	1.0
Resources	1.5
Relationship with the agency's GAD efforts	1.67
Total GAD Score	**13.78**

Interpretation of GAD Score:

0-3.9. GAD is invisible in the project	4.0-7.9. The project has promising GAD prospects	8.0-14.9. Project is gender-sensitive	15.0 – 20.0 Project is gender-responsive

During the project design phase, the initiative shows strength in setting gender equity goals, with a 2.0 score indicating a clear intention to promote gender equality through its objectives. However, the matching of strategies with identified gender issues scored only 1.0, implying that while the goals are aligned with gender concerns, the strategies to address these issues are not as robust or targeted as they could be. The gender analysis of the designed project received a moderately high score of 1.76, reflecting some consideration of gender dynamics, though further analysis could strengthen the project's responsiveness to gender needs.

In terms of monitoring and resources, the initiative demonstrates room for improvement. Both the monitoring of targets and indicators and the maintenance of a sex-disaggregated database scored 1.0. This suggests that while some mechanisms for tracking gender outcomes exist, they are not comprehensive or systematic enough to ensure an effective evaluation of gender impacts. The resources allocated to gender-related efforts are moderate, with a score of 1.5, suggesting that while some commitment exists, additional funding or support could enhance the gender mainstreaming components. The project's alignment with the agency's broader GAD efforts is reflected by a score of 1.67, showing that while the initiative is somewhat connected to the organization's gender goals, there is potential to strengthen this relationship further. A more cohesive alignment with existing

GAD policies and practices would help ensure that the project is gender-sensitive and actively contributing to broader gender equality objectives.

Barriers Faced by Male and Female Teachers

for ICT Skills Development

Theme 1: Varied ICT Competence Levels and Experiences

The analysis reveals a different experiences and skill levels with ICT integration among respondents. For instance, Respondent 1 highlighted, "ICT has made my teaching more dynamic, but I struggle with troubleshooting technical issues," reflecting a positive yet challenging experience. This statement was supported by Respondent 2, who stated, "Transitioning from traditional methods to digital teaching has been challenging due to technical limitations and inadequate support." These responses indicate that while some teachers find ICT integration beneficial, they face significant hurdles related to technical difficulties and limited support. The differences in competence levels emphasized the need for an identified professional development addressing basic and advanced ICT skills.

Theme 2: Barriers to ICT Integration and Skill Acquisition

Respondents identified several barriers to effective ICT integration. Respondent 4 pointed out, "Frequent internet connectivity issues in the classroom" as a significant challenge, while Respondent 6 noted, "Occasional issues with outdated software and hardware, especially older computers." These barriers significantly hinder the ability to effectively use ICT tools. Additionally, Respondent 8 mentioned, "Lack of access to better tools hinders personal and professional development," emphasizing how inadequate resources affect skill acquisition and teaching practices. The common theme across these responses is that technical issues and insufficient resources are major obstacles to both the integration of ICT into teaching and the ongoing development of ICT skills.

Theme 3: Institutional Support and Gender Dynamics

Institutional support for ICT training needed to be improved in addressing advanced needs. Respondent 8 stated, "The ICT training is useful but doesn't provide enough depth for advanced skills," and Respondent 13 added, "The training focuses mostly on basic ICT knowledge, leaving out more advanced content." Despite the vast and equitable distribution of training opportunities, as noted by Respondent 15, "No gender-specific factors affect the institutional support I receive," the need for more comprehensive and continuous professional development is not fully materialized in their respective stations or districts. The responses suggest that while support is fair, a substantial gap in advanced training could be addressed to better support teachers in enhancing their ICT competencies.

Theme 4: Effect on Student Engagement

The effect of ICT-related barriers on student engagement was evident in the responses. Respondent 7 remarked, "Technical issues, especially with hardware, reduce the effectiveness of my lessons, resulting in student disengagement," illustrating the direct attribution between technical failures and reduced student interaction. Similarly, Respondent 15 stated, "Technical issues have caused me to lose valuable teaching time, reducing student engagement during ICT-enhanced lessons," which is evident in how disruptions affect student participation. These insights reveal that technical problems not only hinder the use of ICT tools but also negatively affect the overall learning experience by decreasing student engagement.

DISCUSSIONS

An area where the gender gap becomes evident is in the use of advanced search strategies. Male teachers showed a higher competence level whereas female teachers scored lower which falls under

Moderate Competence. This gap may point to differences in exposure or training, as male teachers appear more adept at employing complex search techniques, such as web feeds or advanced filters. Similarly, while male and female teachers exhibit High Competence in assessing the reliability and validity of information, male teachers again demonstrate slightly higher proficiency in this area. This suggests that male teachers have a firmer grasp of evaluating the credibility of digital information, a critical skill in an age of abundant but often unreliable online content. Both groups, however, show strong competence in organizing and classifying information. The ability to methodically arrange files using folders and backups is a shared strength, with male teachers and female teachers. This reflects an essential skill set for educators, as managing large volumes of digital content efficiently is critical to maintaining an organized teaching practice.

The results showed a general implication that male teachers generally outperform female teachers in most areas of information and data literacy; both genders exhibit commendable competence. The gap between male and female teachers is small, but there is room for growth, particularly for female teachers, in areas such as advanced search strategies and cloud-based file storage. These findings suggest that educational institutions may benefit from offering targeted professional development, mainly focusing on areas where female teachers scored lower, to ensure that all teachers, regardless of gender, are equally equipped with the digital skills necessary to excel in an increasingly technology-driven educational environment.

Regarding collaboration, male and female teachers show High Competence in using shared documents and contributing to content created by others, with male teachers This suggests that both groups are well-equipped to engage in collaborative activities, an essential skill in educational settings increasingly relying on shared digital workspaces. However, when creating and managing content using collaboration tools, such as project management systems or online spreadsheets, male teachers are slightly higher than female teachers, though both are still categorized as High Competence. The lower score for female teachers might indicate that, while they are competent in using collaborative tools, they may be less experienced or confident in taking a leadership role in managing content within these systems.

The data revealed, in general, that both male and female teachers show high overall competence in communication and collaboration; male teachers consistently score higher across most indicators, particularly in areas involving advanced features of communication tools. The slightly lower scores among female teachers, especially in areas requiring more complex digital skills, highlight a potential area for professional development. Providing further training on advanced communication tools and their collaborative functionalities could help female teachers enhance their digital proficiency, ensuring they are equally equipped to manage the demands of the classroom environment.

The findings showed on digital content creation domain indicate that male and female teachers are both highly competent in digital content creation, with only minor differences in specific areas. Male teachers score slightly higher in basic content production and editing, while female teachers demonstrate marginally better competence in reusing copyrighted content and applying advanced formatting. These results highlight a generally balanced level of digital content creation skills between the two genders, though continued training in areas such as copyright navigation and advanced digital tools could further enhance teachers' competence. The overall findings indicate that both male and female teachers are well-equipped to create, format, and manage digital content, an essential capability for educators in today's technology-driven learning environments.

The results on safety and security suggest that male and female teachers are well-equipped to manage ICT safety and security challenges, with minor differences in specific areas. The slightly higher scores of female teachers in device protection and online privacy imply that they may be more proactive in adopting practical security measures. In contrast, the higher scores of male teachers in understanding the environmental impact suggest they might be more reflective about the broader implications of technology use. These findings highlight the need for targeted training that enhances

all aspects of ICT competence across genders, ensuring both theoretical understanding and practical security skills are well-developed.

These findings on problem-solving indicate that while male teachers might be slightly more engaged in regularly updating their skills and staying informed about new technologies, female teachers exhibit stronger problem-solving skills in practical scenarios. This suggests that targeted professional development programs could benefit from focusing on both the strategic aspect of skill updating and the practical application of problem-solving, ensuring that all teachers, regardless of gender, are well-equipped to handle digital classroom environments.

The results on analyzing and reflecting highlight that female teachers generally excel in analyzing the impact of media and reflecting on media use. In contrast, male teachers show a slightly more robust capability in understanding business-related benefits and risks in the digital realm. These findings suggest that while both genders possess robust analytical and reflective skills, there are nuanced differences in their areas of strength. This emphasized on the importance of enriching these strengths in targeted professional development to enhance overall digital competence in educational settings.

The result of the study in evaluating the project demonstrates sensitivity to gender issues, particularly in setting gender equity goals, it requires more thorough data collection, stronger alignment of strategies with gender issues, and improved monitoring and resource allocation. By addressing these areas, the initiative could move toward a more gender-responsive approach, ensuring that it effectively promotes gender equality and addresses both male and female participants' unique needs.

Barriers such as internet connectivity issues, outdated hardware, and limited access to resources emerged as significant hindrances to effective ICT use and skill acquisition, emphasizing the urgency for improved infrastructure and resource allocation. While institutional support for ICT training was described as equitable, it often lacked depth in addressing advanced competencies, leaving teachers underprepared for more complex digital tasks. Additionally, these challenges directly impacted student engagement as technical disruptions reduced teaching effectiveness and hindered active participation in ICT-enhanced lessons.

Training Programs Addressing Gender

Disparities in ICT Competence

Comprehensive ICT Skill Development Workshops

To enhance the ICT skills of all teachers, a series of comprehensive ICT skill development workshops may be sought. These workshops are designed to address a broad range of ICT competencies, from basic digital literacy to advanced technological skills. The primary objective is to equip teachers with the necessary tools and knowledge to integrate ICT into their teaching practices effectively. The workshops will be structured into several modules, including foundational training in digital tools, advanced ICT applications, troubleshooting techniques, and methods for integrating technology into the curriculum. By providing a well-rounded training experience, the workshops aim to address teachers' fundamental and advanced needs.

Success will be measured through various metrics. Participants' satisfaction will be assessed via feedback forms, aiming for a satisfaction rate of 80% or higher. Pre- and post-training assessments will be conducted to gauge improvements in ICT competencies, with a target increase of at least 20% in competency scores. Additionally, tracking the number of teachers who complete the training will be crucial, with a goal of engaging at least 80% of the teaching staff.

The workshops will be made achievable through collaboration with educational technology experts and training providers particularly the Department of Information and Communication Technology (DICT) and Higher Education Institutions such as DEBESMSCAT with poll of experts in ICT education. The program will utilize existing institutional resources and facilities to conduct these sessions,

offering both in-person and online options to maximize accessibility. The initiative will be launched within six months, with quarterly sessions held over the next year. A review will be conducted after the first year to evaluate the program's effectiveness and make necessary adjustments based on feedback and assessment results.

Gender-Inclusive ICT Mentorship Program

The Gender-Inclusive ICT Mentorship Program aims to provide personalized support for teachers, focusing particularly on encouraging female teachers to develop their ICT skills. The program pairs less experienced teachers with more experienced ICT mentors, offering one-on-one guidance and support tailored to individual needs. The mentorship program will track several key metrics to gauge success. The program will monitor the number of active mentor-mentee pairs, targeting at least 100 pairs. Mentee progress will be assessed through feedback and skill assessments, with an aim for at least a 30% improvement in skills over six months. Additionally, we will evaluate the gender distribution of participants to ensure balanced support.

To implement this program, there is a need to identify and train mentors from an institution or recruit external experts such as those certified by the Philippine Commission on Women (PCW). Clear guidelines and resources will be provided to both mentors and mentees to facilitate effective support. The pilot phase of the program will begin within three months, with a full-scale rollout planned after evaluating the pilot's success. Bi-annual reviews will assess progress and allow for adjustments as needed.

Gender-Sensitive ICT Training Needs Assessment

To better understand and address gender-specific barriers in ICT training, conducting a comprehensive Gender-Sensitive ICT Training Needs Assessment is necessary. This assessment will gather data on current ICT skill levels, specific barriers faced by different genders, and the effectiveness of existing training programs. The success of the needs assessment will be gauged by completing the assessment within three months and analyzing data to identify key gender-related barriers and gaps in training. A comprehensive report will be produced, outlining findings and recommendations for tailored training programs.

CONCLUSION AND RECOMMENDATIONS

The analysis of ICT competency levels among male and female teachers demonstrates a generally high proficiency across various dimension, though subtle gender-based differences are evident. In Information and Data Literacy, male teachers exhibit a marginally higher overall competence compared to their female counterparts, with notable distinctions in areas such as advanced search strategies and cloud-based file storage. While both genders show strong abilities in using search engines and organizing information, male teachers tend to perform slightly better in more complex aspects of information management. This highlights the need for targeted professional development to bridge these gaps, particularly for female teachers, ensuring they are equally skilled in both basic and advanced ICT functions.

In Communication and Collaboration, both male and female teachers are competent, though male teachers score slightly higher overall. Both groups excel in basic communication tools and collaboration features, yet male teachers demonstrate greater expertise in advanced functionalities and more frequent engagement with various platforms. The differences suggest that additional training focused on advanced communication tools and collaborative platforms could benefit female teachers, helping them utilize these tools more effectively in their teaching practices. Ensuring that all teachers are equally adept at using these tools is essential for maintaining a high standard of digital communication in educational settings.

The results in Digital Content Creation and ICT Safety and Security reveal that both male and female teachers perform well, with minor variations in specific areas. In Digital Content Creation, both genders exhibit high competence in producing and managing digital content, with slight differences in content creation and copyright issues. Similarly, in Safety and Security, female teachers show a marginal edge in certain protective measures, while male teachers slightly outperform in understanding broader environmental impacts. Hence, findings emphasize the importance of ongoing professional development that addresses both practical and theoretical aspects of digital competence. There is a need to enhance the specific skills where gaps exist and reinforcing strengths, educational institutions can support all teachers in effectively integrating ICT into their teaching practices and maintaining a secure and well-managed digital environment.

Despite the overall high competence, several barriers to ICT skills development were identified. Technical issues such as outdated hardware and unreliable internet connectivity, coupled with insufficient advanced training, were commonly reported challenges. These obstacles impede the ability of both male and female teachers to fully integrate the potential of ICT into the teaching and learning process. Furthermore, the data suggests that institutional support often lacks the depth required to address more advanced ICT needs and does not fully cater to gender-specific challenges.

To address these gaps, appropriate and doable interventions are necessary. Comprehensive ICT skill development workshops should be designed to address both fundamental and advanced skills, ensuring equitable access for all teachers. A Gender-Inclusive ICT Mentorship Program could provide personalized support, particularly for female teachers to enhance their digital competencies. Lastly, conducting a Gender-Sensitive ICT Training Needs Assessment will help identify specific barriers and cascade more relevant training programs.

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