DIGITAL LITERACY AND COMPLETION RATES OF GRADUATE STUDIES AT GULU UNIVERSITY

BY

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A Research Report Submitted to the Department of Education Management Faculty of Education and Humanities, for Review in Partial Fulfillment of the Requirement for the Award of the Degree of Master of Education in Education Management of Gulu University

OCTOBER, 2026

DECLARATION

I, Dickens Omwony declare that this research Report entitled; "Digital Literacy and Completion rates of graduate studies at Gulu University", is my original work and has not been submitted for review to any academic institution for any award.

Sign ..... date. 06/10/2026

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APPROVAL

This is to certify that this research Report entitled: "Digital Literacy and Completion rates of Graduate Studies at Gulu University", was developed under our supervision and is submitted to the Department of Education Management, Faculty of Education and Humanities Gulu University for review with our approval.

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DEDICATION

This research dissertation is lovingly dedicated to my beloved parents, whose love, guidance, prayers, mentorship and unwavering support continue to inspire me, and to cherished memory of my late grandmother, whose love, wisdom, and influence remain forever in my heart.

ACKNOWLEDGMENT

I would like to express my heartfelt gratitude to all those who have supported and guided me throughout the development of this research dissertation. First and foremost, I am deeply thankful to my supervisors Dr. Lamaro Gloria and Dr. Francis David Monk for their invaluable guidance, mentorship, and expertise. I am also indebted to my long-term mentor Mr. Komakech Willy Olanya, Students and Staffs of St. Leo the SS-Gulu and fellow students who have offered their insights and engaged in thought-provoking discussions, which have contributed significantly to the development of this dissertation. Lastly, I am grateful to my family for their words of encouragement, love, understanding, patience and prayers during this academic journey.

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ABSTRACT

Digital literacy is increasingly recognized as a key enabler of academic integration and research productivity in modern higher education. This study examined the relationship between digital literacy skills and the completion of graduate studies at Gulu University, a public institution located in Gulu City, Uganda. The study followed Tinto's Theory of Student Integration and guided by a pragmatism research philosophy, the study adopted a mixed-methods correlational research design. Quantitative and qualitative data were sequentially collected using structured questionnaires, interview guides, and document reviews. A sample size of n = 180 respondents participated in the study, consisting of 160 graduate students and 20 academic staff members selected through cluster random and purposive sampling techniques. Data analysis was performed using descriptive statistics and the Pearson Product-Moment Correlation coefficient. The findings revealed that Graduate students generally demonstrated moderate to high levels of basic digital operations. The highest-rated competencies included digital communication (Mean = 4.26, SD = 3.14), utilization of platforms like WhatsApp and Google Scholar (Mean = 4.19, SD = 1.00), internet information collection (Mean = 4.15, SD = 0.94), and using AI tools like ChatGPT wisely (Mean = 4.13, SD = 0.95). However, notable technical gaps were found in website design (Mean = 3.44, SD = 1.14) and cybersecurity awareness (Mean = 3.48, SD = 1.25). The results further revealed that Timely completion of graduate studies was strikingly low. Respondents strongly disagreed that they graduated within the prescribed time (Mean = 1.98, SD = 0.86) or submitted dissertations on schedule (Mean = 2.04, SD = 0.82). Conversely, they reported significant completion delay (Mean = 3.99, SD = 0.80) heavily driven by external and institutional barriers: financial challenges (Mean = 4.27, SD = 0.52), family obligations (Mean = 4.24, SD = 0.60), work responsibilities (Mean = 4.19, SD = 0.50), limited academic supervision (Mean = 4.19, SD = 0.59), and institutional/administrative hurdles (Mean = 4.15, SD = 0.55). Finally, inferential analysis revealed an almost non-existent and statistically insignificant relationship between digital literacy skills and completion rates ($r = -0.002$, $p = 0.980$). The null hypothesis was not rejected, indicating that a student's level of digital literacy does not influence or predict timely graduate completion at the university. The study concluded that while graduate students at Gulu University possess sufficient functional digital skills, these capabilities do not alleviate low completion rates, which are instead bottlenecked by intense socioeconomic, supervisory, and institutional challenges. It is recommended that Gulu University streamline its administrative pathways, build structured academic supervision systems, and offer flexible scheduling to combat delays. Concurrently, the curriculum should be updated to progress from basic technology usage to advanced digital content creation and cybersecurity competencies.

Keywords: *Digital Literacy, Graduate Completion Rates, Higher Education, Student Integration, Gulu University, Uganda.*

CHAPTER ONE

1.0 Introduction

Digital literacy has become a critical determinant of academic success in higher education, particularly as universities increasingly integrate digital technologies into teaching, learning, and assessment. It encompasses the skills required to access, evaluate, create, and communicate information using digital tools effectively (ElSayary, 2023). Among graduate students, digital literacy is closely linked to academic engagement, research productivity, and timely completion of studies. In developing country contexts such as Uganda, disparities in access to digital resources, infrastructure, and training can significantly influence students' ability to meet academic requirements (Mutenyo, Buyinza & Ssenono, 2022). At Gulu University, where digital learning platforms and online research tools are becoming more prevalent, understanding the relationship between students' digital competencies and their completion rates is essential (Heidari, Mehrvarz, Marzooghi & Stoyanov, 2021). Previous studies suggest that students with higher levels of digital literacy demonstrate better academic performance, improved self-directed learning, and increased persistence in their programs (Martzoukou, Fulton, Kostagiolas & Lavranos, 2020). However, challenges such as limited internet connectivity, inadequate institutional support, and varying levels of digital preparedness may hinder graduate students' progress. (ElSayary, 2023)

This chapter will look at the background of the study, statement of the problem, purpose of the study, objectives, research questions, scope of the study, significance of the study and conceptual framework.

1.1 Background of the Study

This section consists of the historical, theoretical, conceptual and contextual perspectives.

1.1.1 Historical perspective

Historically, Graduate completion have been a concern since the Post–World War II expansion of higher education, predominantly between the late 1940s and 1960s, when enrolments increased rapidly without a corresponding rise in completion (Geiger, 2019). In the contemporary period, graduate education has expanded globally and diversified in purpose. According to recent studies, graduate programs now serve not only academic and research goals but also professional and industry needs, reflecting the increasing complexity of global economies and knowledge systems (Kehm, Shin, & Jones, 2018). The completion of graduate studies is widely recognized as a key milestone for developing advanced expertise, critical thinking, and innovation capacity.

Factors such as academic preparedness, socio-economic background, and access to learning resources were identified as critical determinants of completion (Ntelo, M. (2024).

In Africa, graduate education expanded after independence in the 1960s and 1970s as countries sought to build human resource capacity, but limited funding, inadequate supervision, and poor infrastructure contributed to low completion (Oanda & Ngcwangu, 2018). Early African universities, such as the University of Ibadan in Nigeria and Makerere University in Uganda, were initially allied with Western institutions, which influenced their academic system and standards. However, as enrolment shaped over the decades, the limited capacity of universities to provide adequate supervision, research funding, and facilities led to declining completion of graduate programs (Oanda & Ngcwangu, 2018).

Similarly, in East Africa, increased access to graduate studies since the 1990s has not fully resolved these challenges, with issues such as insufficient research support, weak supervision, and competing responsibilities among students continuing to affect completion, (Amutuhaire, 2024). With the rise of ICT from the late 20th century and the shift to digital

learning especially during the COVID-19 period digital literacy has become a critical factor in graduate success (Dhawan, 2020). While digital tools have improved access to research and communication, barriers such as limited ICT infrastructure, high internet costs, and low digital skills still hinder timely completion, underscoring the need to examine the relationship between digital literacy skills and completion among graduate students.

In Gulu University, completion of graduate studies replicates both global academic traditions and local priorities. Like many modern universities influenced by international models, postgraduate programs at Gulu University require structured coursework, supervised research, and the submission and defense of a dissertation or thesis. However, these programs are often tailored to address region-specific issues such as public health, education, agriculture, peacebuilding, and community development areas particularly relevant to Northern Uganda. Therefore, completing graduate studies at the university is therefore not only an academic milestone but also a contribution to regional reconstruction and sustainable development (Filho, Eustachio, Avila, Dinis, Hernandez-Diaz, Batista, & Abubakar, 2025).

1.1.2 Theoretical perspective

This study is anchored on the Tinto's Theory of Student Integration (Chrysikos, Ahmed & Ward, 2017). Which posits that students' persistence in higher education is determined by academic and social integration. In the contemporary digital learning environment, digital literacy is conceptualized as a key enabler of both academic and social integration)

The completion of graduate studies has been widely studied through various theoretical lenses, among them is Tinto's Theory of Student Integration (Chrysikos, Ahmed & Ward, 2017) which remains one of the most influential. Tinto's theory provides a clear explanation of why some students persist to completion while others withdraw or experience delays in their studies. It emphasizes that a student's decision to stay or leave an academic program is highly

determined by their level of academic and social integration within the institution. Tinto urged that, when students feel competent academically and supported by instructors, they are more likely to develop confidence and commitment to their studies. Strong academic integration reinforces a student's belief that they belong in the institution and can succeed there. And similarly, when students are socially integrated, they are more likely to develop commitment to the institution, which reduces the likelihood of dropout and increases persistence. Lack of social integration often leads to feelings of isolation, which is strongly linked to student attrition. The model included institutional support and external factors such as family background, employment, and financial support, acknowledging that these can shape persistence and completion outcomes. (Tinto, 2017) also argue that, digital literacy and competency enhances student's academic engagement, which he identifies as essential for persistence and timely completion. These mean graduate students with better digital literacy skills are better able to access online learning platforms, conduct scholarly research and communicate with supervisors.

Tinto's Theory of Student Integration provides a precious framework for examining the completion rate of graduate students at global, regional, and institutional levels, including Gulu University. Worldwide, institutions with strong guiding systems, supportive research environments, and collaborative habits tend to have higher completion rates-conditions that advance both academic and social integration. In Africa and East Africa, where supervision capacity and institutional support are always limited, many graduate students experience low level of integration into the academic system, leading to delayed completion period, (Tinto, 2017). Digital literacy skill is therefore seen as enabling factor for student's integration according to Tinto's model.

1.1.3 Conceptual perspective

The concept of completion rate in graduate education is the ratio of students who successfully complete their programs within a stipulated period of time, relative to those who initially enrolled. Scholars also conceptualize completion rate not merely as a statistical outcome but as a multidimensional process shaped by psychological, social, institutional, and environmental factors (McFarland, Cui, Rathbun & Holmes, 2018)

According to Council of Graduate Schools (Geven, Skopek & Triventi, 2018) graduate completion rate is defined as the percentage of students who enroll for a graduate program and successfully earn their degree within a specific time frame, usually two to three years, depending on discipline and enrolment status. Council of Graduate School (CGS) treats master's completion rate as a primary benchmark of graduate program quality and student retention, emphasizing institutional responsibility for timely support.

Conceptually, therefore, graduate completion rate can be understood as a reflection of the equilibrium between the demands of the graduate program and the resources both internal and external available to the student. On the other hand, lack of supervision, limited funding, and psychological distress are among the most cited factors leading to non-completion (Pyhältö et al., 2017).

On the other hand, Chama (2023) asserted that, Digital literacy refers to "the ability to access, manage, understand, integrate, communicate, evaluate and create information safely and appropriately through digital technologies." UNESCO frames it is vital for full participation in modern society and for lifelong learning.

In this study, digital literacy refers to the capacity to understand, use and apply digital technology appropriately for educational and scholarly purposes while completion rates refer

to the ability of a student to enroll and complete a graduate program with the program specified period but not exceeding it due to other factors.

1.1.4 Contextual perspective

The concept of digital literacy is increasingly prevalent in the 21st century. Growing demands from the work sector for individuals to be digitally literate has prompted targeted interventions and innovations from the education sector to instil digital skills into the future workforce. However, despite efforts the digital skills gap remains visible globally, (Reddy et al., 2023).

Universities play a crucial role in advancing research, innovation, and the production of skilled professionals. Despite the growing number of students enrolling in postgraduate programs, completion rates remain a persistent concern in many African universities (Botha, 2018). Many graduate students face prolong delays in completing their studies, while others withdraw before graduation, resulting in to resource wastage at both institutional and individual levels.

In Gulu University, one of Uganda's public universities, the department of education management has a power to train the graduate, researchers, and professionals who can overcome societal challenges through education and social sciences (Kansiime & Kassim, 2026). Empirical evidence indicates that graduate completion at Gulu University is characterized more by delayed progression than timely completion. According to Auditor General's report (2023/2024) on Gulu University, it was revealed that at least 147 master's students had overstayed their programs, with some taking between 6 and 12 years to complete degrees designed for two to three years. At the national level, over 1,019 graduate students across public universities, including Gulu University, exceeded the set study duration, highlighting systemic inefficiencies in postgraduate training. Additionally, longitudinal studies

show that while student enrollment has increased, graduation rates have not kept pace, suggesting declining completion efficiency. These patterns are further compounded by structural challenges such as limited supervision capacity, evidenced by low research productivity among academic staff.

However, integration of digital technologies into higher education has transformed how students' access, process, and produce knowledge. Understanding the factors that affect completion rates at Gulu University is therefore critical for designing institutional policies that promote timely completion and academic excellence. This setting therefore made Gulu University an ideal place for examining the relationship between digital literacy and completion rate of graduate studies, particularly those enrolled in the Master of Education in Education Management, Master of agricultural economy, Master of Business Administration, Public Health, Master in Public Administration and others program in the last ten years.

1.2 Statement of the Problem

Universities play a crucial role in advancing research, innovation, and the production of skilled professionals. Despite the growing number of students enrolling for graduate program, completion rates remain a persistent concern in many African universities (Mphekgwana, Mabila, Tirivangasi, & Makgopa, 2020). Many graduate students face prolong delays in completing their studies, while others withdraw before graduation, resulting into resource wastage at both institutional and individual levels. In modern higher education systems therefore, digital literacy has become a critical competency that supports effective learning, academic productivity, and timely completion of graduate studies.

Ideally, students registered in programs such as the Master of Education Management, Master in curriculum studies, Master's in Public health, Agricultural economy, Public Administration, Business Administration are expected to demonstrate advanced digital abilities in the normal circumstance that enable them to circumnavigate online learning platforms,

access electronic academic materials, analyzed data using digital tools, and communicate competently through digital channels. This expectation aligns with global trends in digital education, where digitally competent learners are shown to be engaged more effectively with coursework and research activities (Caena & Redecker, 2019).

However, the existence evidence suggests that the situation at Gulu University does not fully reflect this ideal. Graduate students continue to exhibit diverse levels of digital readiness, as illustrated by difficulties in navigating online learning systems, limited participation in technology-based learning activities, and frequent reliance on technical assistance for basic digital tasks. Similar challenges have been noted in many African universities, where the students experience infrastructural constraints and limited exposure to digital tools contribute to low digital skills among students (Munene 2022). These limitations at Gulu University manifest in delayed submission of assignments, low engagement with e-learning resources, and challenges in conducting digitally supported research factors that collectively influence the rate at which students' progress through their graduate studies. Thus, the observed indicators strongly propose that gaps in digital literacy may be contributing to reduced completion rates among graduate students in Gulu University. However, limited studies have been carried out to establish the relationship between digital literacy and completion rates of graduate studies which this research focused on.

1.3 Objectives of the study

1.3.1 General objective of the study

The purpose of this study was to examine the relationship between digital literacy and the completion rates of graduate studies at Gulu University.

1.3.2 Specific Objectives of the study

The specific objectives of the study were:

i. To assess the digital literacy skills among the graduate students at Gulu University.

ii. To investigate graduate studies completion rates in Gulu university

iii To explore the relationship between digital literacy and completion rates of graduate studies at Gulu University.

1.4 Research Questions

i. What are the digital literacy skills among graduate students at Gulu University?

ii. What are the graduate studies completion rates in Gulu?

iii. What is the relationship between digital literacy skills and the completion rates of graduate studies at Gulu University?

1.5 Research Hypothesis

i. There is no significant difference in the digital literacy skills among graduate students at Gulu University

ii. There is no significant difference in the graduate studies completion rates in Gulu University?

iii. There is no significant relationship between digital literacy skills and the completion rates of graduate studies at Gulu University.

1.6 The Scope of the Study

These studies were broken down into content scope, geographical scope and time scope to provide a clear understanding the study.

1.6.1 Content Scope.

The content of this study was on digital literacy, complete rates of graduate studies and the relationship between the digital literacy skills and complete rates of graduate studies in Gulu University which are the variables of the study and the study is of “relationship.”

1.6.2 Geographical scope.

Gulu University is a public higher education institution positioned in Gulu City in the Northern Region of Uganda. The main campus lies approximately 5 kilometers northeast of Gulu City's central business district and about 330 kilometers from Kampala, the national capital. Geographically, the university is situated within the Acholi sub-region, an area that has undergone significant socio-economic transformation following years of conflict, which continues to shape access to higher education and institutional development, Gulu University serves a diverse student body drawn from across Uganda, particularly the Northern and West Nile regions. The university has experienced steady growth in enrolment over a decade, with an estimated student population ranging between 5,000 and 7,000 students across undergraduate and postgraduate programs. This expanding population replicates increased demand for higher education, regarding institutional ranking, Gulu University is recognized as one of the leading public universities in Northern Uganda, and it has gained prominence in areas such as community-based education, health sciences, and post-conflict development studies. Globally, its ranking falls within emerging universities, reflecting ongoing growth in research output, academic programs, and regional impact.

1.6.3 Time Scope

The study covered the last ten academic years from 2016-2026 to capture the current trends in digital literacy and completion of graduate studies at Gulu University. The period between 2016 and 2026 provided a critical context for examining completion of graduate studies and digital literacy due to the significant transformation in higher education brought about by the COVID-19 pandemic. During this time, universities worldwide, including Gulu University in Uganda, rapidly transitioned to online and blended learning modalities, making digital literacy an essential requirement for academic success (Kamya, 2022). The research was

expected to be completed in June 2026 but secondary data covered a period of 10 years (i.e, from 2016 to 2026) for an inclusive inference.

1.7 Significance of the Study

To the policy makers, the study provided valuable information for decision making, this could direct the policy decision in technological investment, curriculum reforms and ways of addressing the completion rate among the graduate students in education department at Gulu University. To future readers, this may provide valuable information to guide the researcher on matters concerning completion rate among the graduate students of education management of Gulu University and other interested researcher, the study will highlight the challenges that students face in investigating digital platforms, accessing online resources, and using technology to support research and course work. The discovery will enable readers to appreciate the importance of digital competency in their academic achievement and inspire them to unfold a better digital skill for the timely completion of their graduate programs.

1.8 Conceptual Framework. Of the Study

This conceptual background comprised Independent Variable (I.V), Dependent Variable (D.V) and Moderating Variable (M.V) as indicated below.

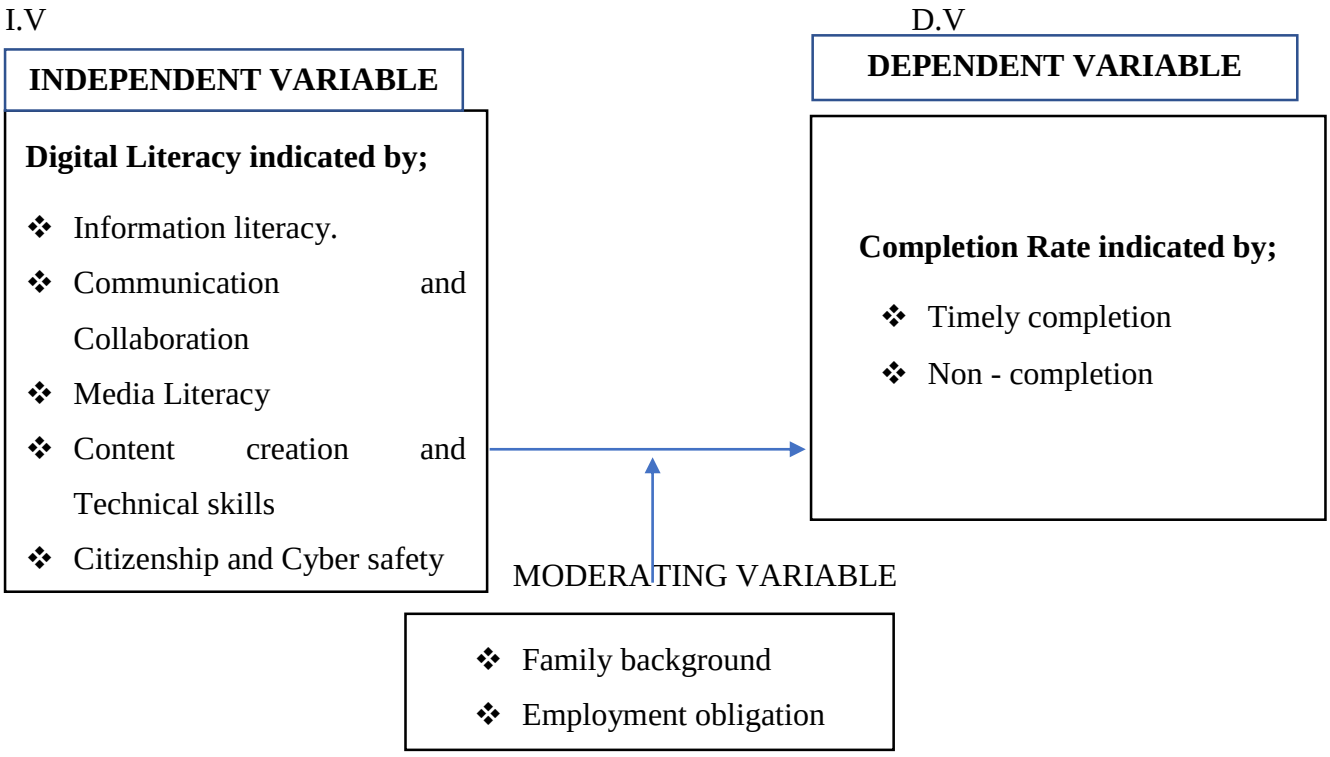


Figure 1: Showing the Conceptual Framework for Digital Literacy and Completion Rate among Graduate Students in education department at Gulu University

Source. Adopted from Tinto's student's integration theory (1993)

According to the conceptual framework, it assumes that digital literacy and completion has got some relationship between them. The I.V digital literacy with indicator such as; communication literacy, technical skills, data analysis, and low level of integration skills may have a positive relationship with the D.V with the indicator such as; timely completion, institutional factors, research related factors and environmental factors. However, this relationship may be positive or negatively influence by moderating variable with the indicator such as, family background, financial constrain, student motivation, internet access and employment obligation.

CHAPTER TWO
LITERATURE REVIEW

2.0 Introduction

This chapter presented a review of existing literature related to digital literacy and completion rate among graduate students at Gulu University. It discusses theoretical frameworks supporting the study, examines pragmatic findings on digital literacy and completion rate, and identifies research gaps relevant to the Ugandan higher education context particularly Gulu University.

2.1 Theoretical Review

Several theories explain how digital literacy influences learning outcomes and academic completion rate. The main theories relevant to this study include the Technology Acceptance Model (TAM), the Constructivist Learning Theory, Self-Regulated Learning Theory (SRLT) and Tinto's Students Integration Theory.

Constructivist Learning Theory Proposed by Piaget (1972) and later long-drawn-out by Vygotsky (1978), Theory argues that learners construct knowledge through active interaction with their environment. Digital literacy plays a vital role in this process by enabling students to discover, create, and share knowledge through digital platforms, (Salimi et al., 2025). In postgraduate programs such as Master of Education Management of Gulu University, digital tools facilitate collective learning, critical thinking, and problem-solving all essential for completing coursework and dissertations efficiently.

Tinto's Theory of Student Integration (1993) which remains one of the most influential. Tinto's theory provides a clear explanation of why some students persist to completion while others withdraw or experience delays in their studies. It emphasized on a student's decision to stay or leave an academic program is highly determined by their level of academic and social integration within the institution. Tinto (1993) theory modified form his (1975) model included

institutional support and external factors such as family background, employment, and financial support, acknowledging that these can shape persistence and completion outcomes. Although originally developed to explain undergraduate attrition, Tinto's theory is highly applicable to graduate education. Graduate students, especially those in research programs, experience unique forms of academic and social integration. Their progress usually depends on effective supervision, research support, peer interaction, and institutional climate. Lack of meaningful integration into the academic community such as poor supervision, isolation, or inadequate institutional support can result in delayed completion or attrition (Gardner, 2009). Tinto, (2017). Also argue that, digital literacy and competency enhances student's academic engagement, which he identifies as essential for persistence and timely completion

Technology Acceptance Model (TAM) Developed by Davis (1989), suggests that an individual's behavioral intention to use technology is determined by perceived usefulness and perceived ease of use. Technology acceptance model posit that technology usage depends on perceive usefulness and ease of use. Graduate with high digital literacy are more likely to perceive digital platforms (e.g., LMS, e-libraries) as useful and user friendly, enhancing their adaptation and learning to improve academic outcomes and completion. This is because TAM invites users to articulate a positive attitude towards specific technique when they realize that this technology is useful and easy to use (Jabeen et al., 2019). These theorical perspective jointly explain how digital literacy influences graduate student's completion rate in the differences university across the globe in the context of higher education, students who perceive digital tools as beneficial and easy to use are more likely to adopt them in their learning processes (Davis, Granić & Marangunić, 2024).

Self-Regulated Learning Theory (SRLT) proposed by Zimmerman (2000) describes Self-Regulated learning as a process whereby learners actively control their cognitive, motivational, and behavioral aspects of learning. Digital literacy improves self-regulated

learning by equipping students with skills to autonomously search for information, manage time, and monitor progress using digital tools, (Panadero, 2017). Students who effectively regulate their learning using technology are more likely to complete their studies within the stipulated period of time.

Social Learning Theory was developed by Bandura (1977). He argues that, learning occurs through observation, imitation, and interaction with others within a social context. According to this, individuals do not learn only through direct experience; instead, they also learn by watching the behaviours, attitudes, and outcomes of others' actions, (Virginia Koutroubas & Michael Galanakis, 2022). In higher and postgraduate education, Social Learning Theory involve the use of collaborative learning, group discussions, peer feedback, and digital learning tools, as these environments allow learners to share knowledge, observe diverse perspectives, and engage in critical thinking and problem-solving

2.2 Digital Literacy among Graduate Students

Though today's students are considered digital natives, they lack the digital literacy skills needed to be competent and productive members of a digital society. Students may have experience with using technology, but they need to develop specific skills that align with consuming and producing with technology (Erwin & Mohammed, 2022).

According to Erdat, Ceren, Ozdemir, Uslu-Sahan & Bilgin's (2023) study, Digital literacy as comprising three dimensions: technical, cognitive, and socio-emotional. Similarly, Meiou, (2025) identifies five essential components: photo-visual literacy, information literacy, reproduction literacy, branching literacy, and socio-emotional literacy. These competencies enable students to navigate digital environments effectively, enhancing their academic performance and completion rates.

According to Fan, W., & Li, Y. (2025) study, the rapid development of digital technologies has driven the transformation of scientific research methods and created new requirements for researchers' digital literacy. The study of postgraduate students' digital research literacy is thus of great significance for scientific research which tend to elevate the level of research quality, enhancing the completion of graduate studies across different higher institution.

Bulger, M. E., Mayer, R. E., & Metzger, M. J. (2014). Pinpointed that, the fact that the digital literacy that is offered in universities to graduate students, in addition to treating digital literacy as a central theme, also focuses on perceived and developed self-efficacy among the graduate students. This is done by strengthening competencies related to digital writing and reading, the use of databases, the digital design of content and materials, and the skills to edit, publish or share them on the web, or applications aimed at treating digital literacy as emerging pedagogies and educational innovation and motivation among the graduate students.

Rinekso, A. B., Rodliyah, R. S., & Pertiwi, I. (2021), asserted that digital literacy is one of the essential components of teaching English in tertiary education and higher institution of learning among graduate students which are expected to demonstrate high-quality English language teaching and research. Likewise, digital literacy is essential for leveraging students' professional and academic success in tertiary education. Similarly, Keykha, B., & Rezaie Kahkhajale, Z. (2024) pointed that, digital literacy is increasingly recognized as an essential component of education and personal development in today's technology-driven society. It extends beyond basic computer skills to include understanding how to engage with digital content responsibly and ethically by the different users especially among the graduate students.

The transformative integration of digital technologies into occupational frameworks and talent competency ecosystems has established educational digitalization and graduate digital literacy enhancement as pivotal components of national reform strategies, particularly

within control science disciplines facing AI-driven industrial transformations (Huang, Z., Li, Z., Wang, L., & Liu, H. 2025)

According to Bell, D. (2021), Academic libraries are currently part of a landscape where there is a rapid growth of digital technologies and electronic resources and they have responded to this by developing their research services. Some of the most specialised and complex research in higher education is conducted by masters and doctoral students and the effective use of digital tools and skills is often crucial to their research workflow and completion of their programs. The need for digital literacy has been further emphasized during the period of global pandemic of 2020-21 which has required the maximization of online working and digital skills to ensure the continuation of education services and research productivity across higher institution of learning and universities across the globe.

According to Maya, L., & Suseno, M. (2022) study, Students in higher education institutions require digital literacy and 21st-century skills for their learning activities. Despite the reality of students born into digital technologies that have become increasingly integrated into learning activities there is still gaps on digital literacy usage among the graduate students existing. According to the study conducted from Jakarta State University to determine the extent of Master of English Language Education (MELE) students' incorporation of digital literacy and 21st-century skills within their learning activities, were the sample consisted of 34 MELE students enrolled in various gap years (2019-2021) in the Master English Language Education department. The findings revealed that most MELE students had a high level of digital literacy and 21st-century skills. However, some students marked themselves as having low levels on it. Thus, the researchers recommended that the students enhance their engagement with technology, incorporate 21st-century skills, and develop digital literacy according to today's requirements for completing their learning goals.

According to the study of Reddy, Sharma and Chaudhary (2020), Information and communication technologies (ICT) along with the internet have fueled advancements and growth in banking, transportation, economics, and most of all in education in the 21st century. The 21st century citizens are provided with new opportunities that have been created with the advancement of ICT. Hence, individuals need a wide range of abilities, competencies, and skills to adapt to the technological era. The study further asserts that transformations in the education sector because of new technologies and their adoption and adaptation that have changed the entire education paradigm.

Though today's students are considered digital natives, they lack the digital literacy skills needed to be competent and productive members of a digital society. Students may have experience with using technology, but they need to develop specific skills that align with consuming and producing with technology (Erwin & Mohammed, 2022).

According to Kayyali, M. (2024), the rapid expansion of digital technology has profoundly impacted the global workforce, changing industries, job responsibilities, and the skills required for success. In this increasingly interconnected and digital world, digital literacy has emerged as a critical competency that extends far beyond basic computer skills, encompassing a broad range of abilities including data analysis, cybersecurity awareness, digital communication, and the ethical use of technology (Li, 2022). For higher education institutions, the imperative to cultivate these talents among graduate students is more critical than ever. As the future workforce, today’s graduate students must be equipped not just with specialized knowledge in their chosen disciplines but also with the digital fluency required to navigate and flourish in a dynamic and complicated work environment.

According to Morgan, A., Sibson, R., & Jackson, D. (2022), the study conducted on higher education students, developing digital literacy enhances their value to future

employers and appeal in the graduate labour market. The study that was intended, to provide a tridimensional (technical, cognitive and etiquette) conceptual framework and definition of digital literacy and investigate students' (N = 324) perceptions of their digital literacy proficiency through an online survey. The study revealed mixed results for different aspects of digital literacy. Students reported the lowest proficiency in using digital information, specifically in terms of evaluation and determining bias and quality of information. The highest levels of proficiency were for social literacy skills, such as communicating appropriately online.

Digital literacy is a must-have competency in the 21st century. It is important for students studying in higher education to have digital literacy skills especially among the graduate students so that they can use digital technologies effectively both in their education and their business life. (Gültekin, V., & Özel, N. 2024). It is necessary to determine the digital literacy levels of graduate students, to determine their deficiencies whether the digital literacy level differs according to various variables.

In higher education, digital literacy is recognized as a vital graduate quality. It encompasses skills such as online research, data analysis, communication through digital platforms, and the use of learning management systems. Without these competencies, students face barriers in completing research tasks, accessing resources, and meeting academic deadlines. It is also found that there is a lack of awareness among students regarding the use of various search strategies for efficient information retrieval which tend to affect their research work leading delayed completion lowering the completion rate, (Uddin et al., 2026)

Globally, the integration of digital technologies into higher education has transformed teaching, learning, and research .Universities have increasingly adopted blended and online learning approaches, requiring both instructors and students to possess adequate digital skills.

Studies indicate that digitally literate students demonstrate higher engagement, motivation, and achievement than digitally illiterate students (Carabregu-Vokshi, Ogruk-Maz, Yildirim, Dedaj & Zeqiri, 2024). In developing countries such as Uganda, however, limited access to digital infrastructure and insufficient ICT training hinder the development of digital literacy.

Gulu University, like any other Ugandan public universities, has implemented digital initiatives such as online registration, e-learning platforms, and electronic thesis submission. Despite these developments, disparities in digital competence among graduate students of masters of education management remain a challenge.

2.3 Completion Rates among the Graduate Students

Master's education is an understudied area in research especially lower completion rates mean fewer qualified graduates available and a financial loss to both students and institutions. This has a society-wide impact and is important to address. As the number of students enrolled in master's programs continues to grow, it becomes critical to review, identify, and discuss factors that affect degree completion (Grover, 2020). Improvements to completion rates cannot be made and maintained without a detailed and nuanced understanding of the underlying factors. This study investigated engineering master's completion rates for students entering a large Midwestern research institution from fall 2009 to spring 2014 (N=485) to identify factors affecting completion rates. Using logistic regression this study found that graduate GPA, funding, full-time enrollment, and summer enrollment affected completion rates

The issue of considerable dropout rate in doctoral programs is well documented across a large number of countries. However, few studies address the factors associated with doctoral completion among Non-U.S. countries, multiple universities and fields of research; Nor do they investigate the interactions between these factors (Wollast, et..al, 2018). Findings indicate that

four factors (marital status, master grade, research field and funding) are directly associated with dropout rate when all factors are considered jointly in the same model. Furthermore, results indicate that some of these factors, such as the marital status and gender, interact. In addition, we found that an accumulation of risk factors leads to a massive increase in dropout rates. Finally, a time course analysis revealed that the highest dropout rate occurs during the first two years and is related to the absence of funding or scholarship.

Studies show that low completion rates among graduate students are influenced by multiple factors, including supervision challenges, financial hardship, limited research skills, and lack of digital competence. Students who are digitally literate can access online resources, communicate effectively with supervisors, and manage their research activities more proficiently- factors that enhance timely completion (Koch & Fehlmann, 2025). (Viđak et al., 2017) carried out a study on improving completion rates of students in biomedical PhD programs in Canadian Universities. Analysis of graduation success at the University of Split School of Medicine PhD programs conducted in 2011 revealed that only 11% of students who enrolled and completed their graduate coursework between 1999 and 2011 earned a doctoral degree.

Higher education in the Czech Republic has for a long time lacked a fixed long-term concept. But what is common to all the directions of its development is the effort to spend the state budget appropriately on educating youth. In this context, there are a number of problems that need to be addressed. One of the most serious is currently the demographic development in Czech society and the associated drop in the number of potential applicants for university studies; and how to motivate those students who have already been admitted to successfully complete their studies, thus eliminating unnecessarily spent funds not only for students who fail to complete their studies, but also for students who attempt to study repeatedly, the so-

called Recycled Students since completion rate stood at approximately only 67% (Blagg, 2018).

According to Massyn (2018) study, he pointed out that, due to various forces of change, namely globalization, funding, the shift to lifelong learning and the need for highly skilled employees, there is pressure on higher education institutions to produce more graduate students. Constraints in the higher education sector, among others a lack of sufficient and experienced supervisors and a more diverse student population, have led to concerns related to the completion rates of research projects among graduate students.

McLaughlin's (2020) study revealed that, there are complex interrelated factors that have impacts on students' retention. Some can be generally described as institutional related factors whiles others tagged as student-related factors. Though, some higher education institutions have put in place some strategies to enhance student retention, completion rates among graduate students is still low, especially in distance learning programmes.

Globally, there is a high quest for graduate education with many prospective students aspiring to attain advanced qualifications to obtain a better career path and higher income. In Uganda, many students enroll in different graduate programs but fail to complete them in the stipulated timeframe (Atibuni et al., 2017). Furthermore, most of the master's students tend to successfully finish their first year which basically has the coursework component yet fail to complete the second year that has the research component. Doctoral students make little progress when it comes to their research.

According to Gilbert, Margaret and Sarafina, (2025) study, Graduate programmes are necessary in training and equipping graduate students with skills relevant to the current and emerging demands of life. As much as a number of students enrol for graduate programs such as master and PhD, it is believed that the graduation rates in these programmes are generally

lower than expected. This study used survey research design to establish reasons behind the delayed completion of graduate studies amongst graduate students, at Masters and PhD levels, enrolled in Kenya's universities. The study established the average fee to be Ksh. 412,456 and Ksh. 771,031 for Masters and PhD studies, respectively. Some students: were not assigned supervisors; could not submit their dissertation and thesis for examination; and differed coursework due to inability to raise school fees, all contributing to a stall in their academic journeys. About 34.5% of the respondents reported that completion of their graduate studies was affected by work-related demands. Some students opined that they took unpaid leaves so as to create time for studies; others indicated that they had little time for data collection and theses writing; while others found it a tall order to obtain study leaves from their employers. About 52% and 32% of the respondents met their academic supervisors on rare and irregular basis, respectively, thus delaying their graduation. Majority of students with multiple supervisors indicated that they met them separately (72%), with the rest meeting them jointly.

According to the study of Bostwick and Weinberg (2022), study on the effects of peer gender composition in STEM doctoral programs on persistence and degree completion. Leveraging unique new data and quasi-random variation in gender composition across cohorts within programs, the study revealed that women entering cohorts with no female peers are 11.7 percentage points less likely to graduate within 6 years than their male counterparts. A standard deviation increase in the percentage of female students differentially increases women's probability of on-timely graduation by 4.4 percentage points. These gender peer effects function primarily through changes in the probability of dropping out in a PhD program's first year.

According to Amani, Myeya and Mhewa (2022), Universities have a key role of creating knowledge through research undertaken by their staff and students in diverse fields. Master's and doctoral degree programs in universities introduce students to the world of

independent research so that through their studies they are able to generate new knowledge which in turn, contributes to personal, professional, and national development. Depending on university regulations and guidelines, postgraduate studies at master's and doctoral levels have prescribed subjects which these students undertake and are expected to pass after examinations, write dissertation and thesis within a specified time frame. In Tanzania, the duration of a postgraduate program is between 18 to 24 months for a master's and from 36 to 48 months for a doctoral degree. Similarly, Nwagwu, (2016) asserted that, duration and completion time of the programmes varies depending on each nation's postgraduate programmes regulations. Completion time is a calculated amount of time required for any particular task to be completed (Nwagwu, 2016).

Oyugi, Baker, Lamm and Nkurumwa (2023). Asserted that enrollment for master's and Ph.D. programs worldwide and, to some extent, in Sub-Saharan Africa, a considerable number of graduate students lag behind in completing theses and dissertations (TD) persists. Personal, situational, and contextual factors, such as supervision arrangements and research abilities, have been correlated with the time taken for TD completionn among the graduate student hence causing delay of program they registered for.

According to Japheth, Namubiru Ssentamu, Kyalo Wambua and Jepkoech Kurgat (2023), completing a postgraduate programme is assumed a great achievement to the graduate, the institution of higher learning and universities across the globe, the academic profession, and the country, in form of the economy. However, the quality and throughput of graduate studies are a concern worldwide among institutions of higher learning. The period of time it takes for graduate students to complete their studies, the success rate of graduate students, and the high percentage of graduate students who dropout before graduation raises concerns (Rong'uno, 2016).

According to Gwalupama, Mpelwa and Pai (2025) study conducted in Tanzanian public universities shows that 74 % of master's students fail to complete their degrees within the scheduled 18–24 months, indicating national skills gaps, delaying workforce entry, and imposing financial and psychological burdens on students. Similarly, Prior studies in sub-Saharan Africa focused on barriers to students and supervisors that hinder master's students from completing their degrees within the stipulated time zone; however, institutional barriers specific to Tanzania's graduate program remain a crucial issue. These coalesced into a five-dimensional model demonstrating how institutional structures interact to hinder the on-time completion.

2.4 Relationship between Digital Literacy and Completion Rates of Graduate Studies

According to van Laar et al. (2020), digital literacy promotes self-directed learning, adaptability, and effective communication, all of which are predictors of academic completion rate among graduate students. Karp and Bork (2012) found that students who effectively use digital platforms for collaboration and research display higher levels of motivation and commitment to completing their programs which may be of advantage to completion of their program.

According to, Obura et al. (2020), graduate students with digital literacy training reported shorter completion periods and greater satisfaction with academic support systems compared to students without. At Gulu University, subjective evidence suggests that while digital facilities exist, many Master of Education Management students, Agriculture, Business, Public health and others struggle with effective utilization. This challenge may contribute to extended study durations and delayed completion leading to low completion rate among the master students of education management. Thus, exploring how digital literacy correlates with completion rates in this context is both timely and necessary.

Jeno, Danielsen and Raaheim (2018) investigated a model based on Self-Determination Theory (SDT) to predict academic achievement and dropout intentions among biology students in higher education in Norway using Students ($n = 754$) from a representative national sample participated in the cross-sectional study. The results showed that Self-Determination Theory

(SDT) to predict academic achievement and dropout intentions among biology students in higher education in Norway.

In a study to investigate the problems experienced through online education and measuring digital literacy in Turkey for masters' degree and PHD students, (Altun, 2021) study revealed that learners were mostly facing problems such as internet connection, losing concentration, and social interaction. Furthermore, their digital literacy sub-scales were found as very good and good.

In a study to explore the effect of digital literacy on academic performance of the students at higher education level using mixed method and gathered data with a questionnaire and semi structured interviews, (Abbas et al., 2019) revealed that digital literacy had significant effects on communication skills, research skills and confidence of the students and insignificant effect on students' CGPA.

According to the study of (Reddy et al., 2023), Information and communication technologies (ICT) along with the internet have fueled advancements and growth in banking, transportation, economics, and most of all in education in the 21st century. The 21st century citizens are provided with new opportunities that have been created with the advancement of ICT. Hence, individuals need a wide range of abilities, competencies, and skills to adapt to the technological era. The study further asserts that transformations in the education sector because of new technologies and their adoption and adaptation that have changed the entire education paradigm.

In contrast, students with low digital literacy often struggle with information retrieval, plagiarism detection tools, and data analysis software, resulting in delayed thesis submission and attrition (Wissame & Teqwa, 2025). This underscores the need to strengthen digital literacy as a strategic measure for improving completion rates in graduate programs.

Practical evidence supports a strong positive relationship between digital literacy and student completion rates. According to Karatas and Arpaci's (2021) study, digital literacy promotes self-directed learning, adaptability, and effective communication, all of which are predictors of academic completion rate among graduate students. Further that students who effectively use digital platforms for collaboration and research display higher levels of motivation and commitment to completing their programs.

At graduate level, digital literacy directly influences research productivity. Students with adequate digital competence can efficiently search academic databases, use citation management tools, and analyzed data using statistical software, (Rafi et al., 2019). These abilities significantly reduce time spent on research tasks and increase the likelihood of completing dissertations within the required timeframe.

Integrating digital literacy in all fields of our lives especially in education requires enhancing the learners' proficiency in writing their theses and dissertations, as well as a high level of intelligible writing process. The research of Wissame and Teqwa (2025) aimed to investigate the multifaceted roles of digital literacy in enhancing Master student's dissertation writing experience and practice focusing on how digital tools and technology affects the students' writing skills and overall academic performance in Nigeria. The results showed that digital tools and technology has significant effects on the students' writing skills and overall academic performance.

According to (Vermisli et al., 2022), graduate students with digital literacy training reported shorter completion periods and greater satisfaction with academic support systems. At Gulu University, subjective evidence suggests that while digital facilities exist, many Master of Education Management students struggle with effective utilization. This challenge may contribute to extended study durations and delayed completion leading to low completion rate

among the master students of education management. Thus, exploring how digital literacy correlates with graduate completion rates in this context is both timely and necessary.

2.5 Summary of Gaps Identified

The reviewed literature demonstrates that digital literacy plays a significant role in promoting student engagement, academic achievement, and timely completion. Similarly, a number of literatures do point to the fact that completion rates are minimal among graduate students. However, there is limited research focusing on the relationship between digital literacy and completion rates among graduate students in Uganda, particularly at Gulu University. Therefore, this study seeks to fill this gap by examining how digital literacy relates to completion rates among graduate students at Gulu University. The findings may inform policy and practice aimed at improving digital literacy and increasing completion rates among the graduate students.

CHARPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter summarized the procedures and methods that were employed to examine the relationship between digital literacy and completion level among graduate students at Gulu University. It presented the research philosophy, research approaches, research design, study area, target population, sample size and sampling techniques, data collection instruments, data analysis procedures, validity and reliability considerations, ethical issues, and limitations and delimitation of the study. The methodology is designed to ensure that the study produces credible, reliable, and evidence-based findings, (Huyler & McGill, 2019).

3.1. Research Philosophy

Being a quantitative method of study, this study adopted positivism research philosophy which is appropriate for quantitative method. Positivism is a philosophical approach which emphasizes the study of observable and measurable facts using the systematic and empirical methods. The philosophy is associated to quantitative research because it supports the measurement of variables, statistical analysis, and testing for the relationship between the difference variables or hypothesis (Saunders, lewis, & Thornhill, 2019). Therefore, the positivist philosophy was considered valuable for this study because the researcher collected numerical data and analyzed using statistical techniques.

3.2 Research Approach

The study adopted a deductive research approach guided by positivism philosophy. The deductive approach involves developing the research hypothesis or expectation from the existing theories and testing those using empirical data (Saunders et al. 2019). The approach was necessary for the study because it enabled the researcher to use the existing knowledge

and theoretical concepts to formulate the research question, and objectives, collect the numerical data and analyze the finding statistically. The results were then used to determine whether the proposed relationship between digital literacy and completion of graduate studies at Gulu University were supported by the empirical evidence.

3.3 Research Design

The study employed a cross-sectional correlational research design. The design enabled the researcher to collect the data from respondents at a given point in time. While a correlational design examined the relationship between two variables without manipulating them. This design was appropriate for the study because it aimed to establish the relationship between digital literacy and completion of graduate studies at Gulu University (Cresswell&Cressell, 2018)

3.4 Target Population

The target population consisted of all graduate students enrolled at Gulu University between the calendar year 2016 and 2026, academic staffs and administrators who were once students at Gulu University. This target population was considered proper because supervisors provided practical guidance for developing effective supervisory relationships, supporting student writing, and circumnavigating academic challenges. Administrators provided, managerial actions such as advising support, early-alert systems, and retention policies that shape institutional capacity to help students complete their programs and enhances the completion rate among the graduates, (Tinto, 2017). Therefore, involving these groups helped the researcher to gather reliable and relevance quantitative and qualitative data to determine the relationship between digital literacy and completion rate among the graduate students of masters of education management at Gulu University, (Huyler & McGill, 2019).

3.5 Sample Size

The study employed a purposive sampling for this research hoping that they have key information about the completion rate among the graduate students at Gulu University , for this quantitative strand, the researcher also employed cluster random sampling in order to access the data from dispersed former students The sample size was determined using Yamane's (1967**)** formula for finite populations; this helped the researcher to do the comparison of convenience sampling and purposive sampling (Mohan Sundaram & Harsha, 2024). It also provided a broader sampling theory context in this research study since it involves both quantitative and qualitative study.

$$n = \frac{N}{1 + N(e)^2}$$

Where:

n = sample size

e = level of precision (0.05)

N = total population (360)

$$n = \frac{360}{1 + 360(0.05)^2}$$

n= 189.47

Therefore, a total of 180 respondents participated in the study, consisting of 160 graduate students and 20 academic staff members who were once students of Gulu University to avoid biasness.

3.6 Sampling Techniques

The study used a cluster random sampling technique for selecting graduate students to ensure representation across different academic cohorts and study statuses (completed,

ongoing, and delayed). From each cluster, sampling was done at difference stages called multistage sampling, (Huyler & McGill, 2019). Purposive sampling was used to select departmental members, administrators and supervisors who have direct experience with graduate supervision and graduate student completion rates.

3.7 Data Collection Methods

Since it was a quantitative method of study, the researcher collected a numeric (data sequentially to address the research question which allowed the researcher to measure variables objectively, compared the results, identify the pattern of relationship and apply the statistical method in order to test for the hypothesis (Bhandari, 2023). The structured questionnaire ensured that similar was collected from all the targeted respondents, thereby improving the consistency and enabled comparison of responses. The finding was therefore, presented using the frequencies and percentages.

3.7.1 Questionnaires

Structured questionnaires were administered to graduate students to collect quantitative data on their digital literacy levels, usage of digital tools, and completion experiences. The questionnaire contained the set question designed to obtain the information for the respondents in the systematic manners which included Likert-scale items and closed-ended questions on the different areas of the digital literacy for graduate students, allowing the respondents to select appropriate answers from the predetermine options. This facilitated the collection of numerical data that was analyzed and presented statistically (Moser & Korstjens, 2018).

3.7.2 Document Review

This method was used in data collection and from existing physical and online sources (Moser & Korstjens, 2018). Secondary data such as program records, completion statistics, Viva and proposal defense meeting minutes, attendance register and reports were reviewed to

provide contextual understanding and triangulate findings from primary data sources. This were combined to supplement the research data.

3.8 Data Collection Instruments

Questionnaire was used to collect data on digital literacy among graduate students in Gulu University (Appendix B), Statistical table (Table 1,3,4,5,6,7 and 8) was used to collect information on completion rates among graduate students in Gulu University. The results were summarized in the table shown in Table 2, 3, 4,5,6,7 and 8) for analysis using both descriptive statistics and inferential statistics (Chi-square test of goodness of fit) since completion rates across all programs was associated.

3.9 Validity and Reliability of Instruments

3.9.1 Validity

Content validity was safeguarded through expert review by university supervisors and ICT education specialists. The Content Validity Index (CVI) was calculated based on expert ratings. A CVI value of 0.70 was considered satisfactory (Moser & Korstjens, 2018).

Formula

$$I - CVI = \frac{\text{Number of experts rating the item as relevant}}{\text{Total number of experts}}$$

CVI= 27/30 =0.90

So, the CVI=0.90(90%)

A CVI of 0.70 or above is commonly considered relevance for May research instruments.

Experts usually rate items on a 4-points scale, for example:

1= Not relevant 2= Somehow relevant 3=Quite relevant 4=Highly relevant

3.9.2 Reliability

Reliability of the questionnaire for this study was tested using Cronbach's Alpha Coefficient. A reliability coefficient of 0.70 and higher indicated acceptable internal steadiness (Chan & Idris, 2017). The reliability coefficient of the questionnaire was calculated and found to be 0.90 with coefficient of determination (r^2) =0.81. This means that the questionnaire measured up to 81.0% of the intended purpose of the research.

3.10 Data Analysis

3.10.1 Quantitative data analysis

Quantitative data from questionnaires on digital literacy among graduate students in Gulu University were analyzed using Chi-Square test of dependence since graduate students in all programs in Gulu University are homogeneous and hence associated. Chi-Square test of goodness of fit is the only inferential status to measure associated groups (Chan & Idris, 2017). The same method (i.e, Chi-square test of goodness of fit) was used to analyze completion rate for graduate students in Gulu University.

3.11 Ethical Considerations

The study was conducted in accordance with accepted ethical standard in education where voluntary participation and informed consent will be obtained from all participant before involvement in the study, (Benlahcene, 2021). Participants were informed about the purpose and the objectives of the study and their right to withdraw at any time without any consequence. Confidentiality was ensured by anonymizing responses and securely storing data and the findings were used solely for academic purposes.

3.12 Limitations and Delimitation of the study

The study faced limitations such as restricted access to completion data, potential response bias, time and financial constraints, some respondents were unwilling to participate in the study others failed to complete the questionnaire, the study also rely on self-reported information obtained from the questionnaires and limited generalizability that affect the research process and findings, as well as delimitation that defines it scope and focus (Moser & Korstjens, 2018). However, these was mitigated by triangulating data sources, ensuring namelessness, and using a sufficiently large and diverse sample.

CHAPTER FOUR
DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.0. Introduction

This chapter presents data analysis, interpretations and summary of the findings based on the objectives formulated under chapter one. Descriptive statistics was used to analyze the background information of the respondents and objectives one and two. Pearson correlation was used to analyze the relationship between digital literacy skills and completion of graduate studies at Gulu University. Interview data were content analyzed following the study objectives.

4.1. Demographic Characteristics of Respondents

Description of demographic characteristics according to the study interest were structured as gender, age group, marital status, study programme, year of study, mode of study, employment status and place of residence.

Table 1 below presents the demographic characteristics of the 180 respondents who participated in the study. The variables examined include gender, age group, and marital status, year of study, mode of study, employment status and residence. These characteristics are important because they provide background information about the respondents and help determine the representativeness of the sample.

Table 3: Showing Demographic Characteristics of Respondents (N=180)

What is your gender?	Frequency	Percentage	Cumulative Percent
Male	*101*	*56.1*	*56.1*
Female	*79*	*43.9*	*100.0*
What is your age group?			
25-30 years	*90*	*50.0*	*50.0*
31-35 years	*55*	*30.6*	*80.6*
36-40 years	*17*	*9.4*	*90.0*
41 years and Above	*18*	*10.0*	*100.0*
What is your marital status?			
Single	*71*	*39.4*	*39.4*
Married	*101*	*56.1*	*95.6*
Divorced	*5*	*2.8*	*98.3*
Widowed	*3*	*1.7*	*100.0*
What is your year of study?			
First year	*58*	*32.2*	*32.2*
Year2	*97*	*53.9*	*86.1*
Third year	*23*	*12.8*	*98.9*
Others specify	*2*	*1.1*	*100.0*
What is your mode of study?			
Fulltime	*94*	*52.2*	*52.2*
Distance / Online	*16*	*8.9*	*61.1*
Weekend	*70*	*38.9*	*100.0*
What is your employment status?			
Full time job	*66*	*36.7*	*36.7*
Self-employed	*60*	*33.3*	*70.0*
Part time job	*27*	*15.0*	*85.0*
Not employed	*27*	*15.0*	*100.0*
What do you reside?			
On-campus	*26*	*14.4*	*14.4*
Off-campus- rural	*57*	*31.7*	*46.1*
Off-campus-urban	*97*	*53.9*	*100*

Source: Primary Data, 2026

Gender of Respondents. The findings indicate that 101 respondents (56.1%) were male, while 79 respondents (43.9%) were female. This suggests that males constituted the majority of the study participants. Although there was a relatively balanced representation of both genders, male respondents were slightly more represented than females.

Age Group of Respondents. Half of the respondents, 90 (50.0%), were aged between 25–30 years, making this the dominant age category. Respondents aged 31–35 years constituted 55 (30.6%), while those aged 36–40 years were 17 (9.4%). Participants aged 41 years and above accounted for 18 (10.0%). The findings imply that the study population was predominantly composed of young adults in their productive and active educational years.

Marital Status of Respondents. The majority of respondents, 101 (56.1%), were married, followed by 71 (39.4%) who were single. A small proportion of respondents were divorced, 5 (2.8%), while 3 (1.7%) were widowed. These findings indicate that most respondents had family responsibilities, which may influence their educational experiences and perceptions.

Year of Study. Regarding year of study, 97 respondents (53.9%) were in their second year, representing the largest category. First-year students accounted for 58 (32.2%), while third-year students were 23 (12.8%). Only 2 respondents (1.1%) belonged to other categories. This suggests that the views expressed in the study were largely influenced by second-year students who had accumulated substantial experience within the institution.

Mode of Study. The results reveal that 94 respondents (52.2%) were enrolled in full-time programmes, 70 (38.9%) were weekend students, and 16 (8.9%) were pursuing distance or online studies. This indicates that the majority of respondents participated in conventional full-time learning, although a significant proportion combined studies with other commitments through weekend programmes.

Employment Status. The findings show that 66 respondents (36.7%) were employed on a full-time basis, while 60 (33.3%) were self-employed. Additionally, 27 respondents (15.0%) had part-time jobs and another 27 (15.0%) were unemployed. These results indicate that a large proportion of respondents were economically active, either through formal employment or self-employment, which may affect their academic engagement and learning experiences.

Residence of Respondents. Most respondents, 97 (53.9%), resided in off-campus urban areas, while 57 (31.7%) lived in off-campus rural areas. Only 26 respondents (14.4%) stayed on campus. This suggests that the majority of participants commuted from their residences and may have faced varying environmental and logistical factors affecting their studies.

In summary, the study sample was predominantly male (56.1%), aged between 25–30 years (50.0%), and married (56.1%). Most respondents were second-year students (53.9%), enrolled in full-time programs (52.2%), and economically active through full-time employment (36.7%) or self-employment (33.3%). Furthermore, more than half of the respondents (53.9%) resided in urban off-campus locations, while relatively few lived on campus (14.4%).

This implies that:

Representativeness of the Sample: The inclusion of respondents from different genders, age groups, years of study, employment categories, and residential locations enhances the diversity of perspectives and improves the credibility of the study findings.

Maturity of Respondents: Since the majority were aged between 25 and 35 years and married, respondents were likely mature enough to provide informed and reliable responses based on their educational and life experiences.

Influence of Academic Experience: The dominance of second-year students suggests that many respondents had adequate exposure to the institution's academic environment, enabling them to provide meaningful insights regarding the study variables.

Employment Commitments: The high proportion of employed and self-employed respondents indicates that work-related responsibilities may influence their academic experiences, perceptions, and outcomes. Therefore, employment status should be considered when interpreting the study findings.

Mode of Study Considerations: The presence of full-time, weekend and distance learners imply that respondents experienced different learning environments, which may affect their responses and enrich the overall findings.

Residential Context: Since most respondents lived off-campus, particularly in urban areas, factors such as transportation, access to learning resources, internet connectivity, and study environments may have influenced their educational experiences and perceptions.

Generalizability of Findings: The demographic diversity of the respondents suggests that the study findings can reasonably reflect the characteristics and experiences of the wider student population within similar higher education institutions.

4.2. Research Question One

What are the digital literacy skills among graduate students at Gulu University?

Table 2 below presents descriptive statistics on the level of digital literacy skills among graduates. Responses were measured on a five-point Likert scale, where higher mean scores indicate stronger agreement and higher levels of digital literacy competence. The overall pattern of responses shows that graduates generally possessed moderate to high levels of digital literacy skills, with most mean scores exceeding 3.50.

Table 4: Showing Digital Literacy Skills among Graduates (N=180)

Descriptive Statistics

	Minimum	Maximum	Mean	Std. Deviation
I know how to use computer and other digital tools	*1.00*	*5.00*	*4.1000*	*1.05756*
I know how to us the internet to collect information	*1.00*	*5.00*	*4.1500*	*.94233*
I can manage and transform online data like from internet	*1.00*	*5.00*	*3.8611*	*1.00704*
I can use digital platforms like WhatsApp and google scholars	*1.00*	*5.00*	*4.1944*	*.99775*
I can copy and edit online information	*1.00*	*5.00*	*4.0056*	*.89379*
I have the ability to use and evaluate online data and applications	*1.00*	*5.00*	*3.9111*	*.94123*
I have the ability to use academic search engines and websites	*1.00*	*5.00*	*3.8833*	*.91709*
I can present data using tools like graphs, spread sheets etc	*1.00*	*5.00*	*3.9056*	*.90125*
I can use SPSS to obtain both descriptive and inferential data	*1.00*	*5.00*	*3.6333*	*1.06178*
I have knowledge on hard wares and soft wares	*1.00*	*5.00*	*3.8278*	*.95619*
Zoom and google classrooms are computer networks I can use	*1.00*	*5.00*	*3.8667*	*.91175*
I can distinguish between reliable information and misinformation of electronic data	*1.00*	*5.00*	*3.7333*	*.93713*
I can make sense of electronic data like journal articles with accuracy and no bias	*1.00*	*5.00*	*3.6556*	*1.01013*
I have the capacity to evaluate the credibility of online data	*1.00*	*5.00*	*3.6944*	*1.04158*
I can analyze digital contents	*1.00*	*5.00*	*3.9167*	*.91465*
I can interpret digital information	*1.00*	*5.00*	*4.0111*	*.94537*
I can effectively use digitals to communicate	*1.00*	*44.00*	*4.2556*	*3.13944*
I can share knowledge effectively online with friends through online platforms like zoom	*1.00*	*5.00*	*3.9667*	*.95660*
I can collaborate in google work spaces including google classroom	*1.00*	*5.00*	*3.8444*	*.93845*
I have the knowledge of transforming media data	*1.00*	*5.00*	*3.7667*	*.96936*
I can co-create new concepts, ideas and knowledge online	*1.00*	*5.00*	*3.8778*	*.93746*

I have the ability to do web designing and publishing	*1.00*	*5.00*	*3.5167*	*1.16980*
I understand Cyber Safety protocols	*1.00*	*5.00*	*3.4778*	*1.25273*
I can behave ethically when online	*1.00*	*5.00*	*4.0778*	*.84863*
I can protect my personal data by creating storage password	*1.00*	*5.00*	*4.1222*	*.96100*
I can observe copyright rules	*1.00*	*5.00*	*3.9333*	*1.00056*
I understand that plagiarism is unethical behavior	*1.00*	*5.00*	*3.9333*	*1.06546*
I can take digital responsibility and rights	*1.00*	*5.00*	*4.0111*	*.92748*
I can use Artificial Intelligence tools like Chat GPT wisely	*1.00*	*5.00*	*4.1278*	*.94562*
I can identify the signs of online bullying	*1.00*	*5.00*	*3.8611*	*.96742*
I understand unethical implications of interaction on social media	*1.00*	*5.00*	*3.8722*	*1.03584*
I can create online educational and scholarly contents	*1.00*	*5.00*	*3.6889*	*1.02640*
I can edit and share digital scholarly contents in presentations, videos and coding	*1.00*	*5.00*	*3.7722*	*.91438*
I can design websites	*1.00*	*5.00*	*3.4444*	*1.13955*
I have navigation and orientation skills of online data	*1.00*	*5.00*	*3.7500*	*.94470*
I do computer training	*1.00*	*5.00*	*3.8389*	*1.05260*
I can publish and do peer review of digital information	*1.00*	*5.00*	*3.7056*	*1.05012*

The findings indicate that graduates were highly competent in basic digital operations. Respondents reported strong abilities in using digital tools and technologies (Mean = 4.10, SD = 1.06), using the internet to collect information (Mean = 4.15, SD = 0.94), and utilizing digital platforms such as WhatsApp and Google Scholar (Mean = 4.19, SD = 1.00). Similarly, graduates demonstrated competence in copying and editing online information (Mean = 4.01, SD = 0.89), interpreting digital information (Mean = 4.01, SD = 0.95), and communicating effectively through digital technologies (Mean = 4.26, SD = 3.14), which was the highest-rated item.

In the area of information and data literacy, respondents showed relatively high capabilities in evaluating online data and applications (Mean = 3.91, SD = 0.94), using

academic search engines and websites (Mean = 3.88, SD = 0.92), analyzing digital content (Mean = 3.92, SD = 0.91), and presenting data using digital tools such as spreadsheets and graphs (Mean = 3.91, SD = 0.90). However, lower ratings were observed in evaluating the credibility of online data (Mean = 3.69, SD = 1.04), distinguishing reliable information from misinformation (Mean = 3.73, SD = 0.94), and making unbiased interpretations of digital information (Mean = 3.66, SD = 1.01).

Regarding communication and collaboration skills, graduates reported positive abilities to share knowledge online (Mean = 3.97, SD = 0.96), collaborate in Google Workspace and Google Classroom environments (Mean = 3.84, SD = 0.94), and co-create ideas and knowledge online (Mean = 3.88, SD = 0.94). These findings suggest that graduates were comfortable working and interacting in digital environments.

In relation to content creation and innovation, respondents demonstrated moderate competence in creating educational and scholarly content (Mean = 3.69, SD = 1.03), editing and sharing scholarly content through presentations, videos, and coding (Mean = 3.77, SD = 0.91), and transforming media data (Mean = 3.77, SD = 0.97). However, relatively lower scores were reported in web design and publishing (Mean = 3.52, SD = 1.17) and website design (Mean = 3.44, SD = 1.14), suggesting limited advanced technical skills.

Concerning digital safety and ethics, respondents exhibited strong awareness of ethical online behavior (Mean = 4.08, SD = 0.85), protection of personal data through passwords (Mean = 4.12, SD = 0.96), understanding plagiarism as unethical behavior (Mean = 3.93, SD = 1.07), observing copyright rules (Mean = 3.93, SD = 1.00), and taking digital responsibility (Mean = 4.01, SD = 0.93). They also reported competence in using Artificial Intelligence tools such as ChatGPT wisely (Mean = 4.13, SD = 0.95). However, understanding cyber safety protocols recorded one of the lowest mean scores (Mean = 3.48, SD = 1.25), indicating a potential gap in cyber security awareness.

Similarly, respondents showed moderate proficiency in specialized digital skills such as SPSS usage for descriptive and inferential analysis (Mean = 3.63, SD = 1.06), publishing and peer-reviewing digital information (Mean = 3.71, SD = 1.05), and navigating online information systems (Mean = 3.75, SD = 0.94).

The findings reveal that graduates generally possessed a high level of digital literacy skills. The strongest competencies were observed in effective use of digital communication technologies (Mean = 4.26), use of digital platforms such as WhatsApp and Google Scholar (Mean = 4.19), internet-based information searching (Mean = 4.15), wise use of Artificial Intelligence tools such as ChatGPT (Mean = 4.13), protection of personal data through passwords (Mean = 4.12) and use of computers and digital tools (Mean = 4.10).

Moderate competencies were evident in data analysis and interpretation, academic information searching, online collaboration and communication, digital content creation and sharing and SPSS utilization and digital publishing.

The weakest areas included website design (Mean = 3.44), understanding cyber safety protocols (Mean = 3.48), web designing and publishing (Mean = 3.52), making unbiased interpretations of digital information (Mean = 3.66) and evaluating the credibility of online information (Mean = 3.69).

The findings demonstrate that graduates possess generally strong digital literacy skills, particularly in basic digital operations, online communication, information retrieval, ethical technology use, and the application of emerging technologies such as Artificial Intelligence. These competencies indicate that graduates are reasonably prepared to participate in digitally driven academic and professional environments. However, notable gaps remain in advanced digital competencies, particularly website development, cyber security awareness, critical evaluation of online information, and specialized data analysis skills. Therefore, while the

overall level of digital literacy among graduates can be considered satisfactory to high, there is a need for higher education institutions to strengthen training in advanced digital skills, cyber safety, information evaluation, and digital content creation Enhancing these areas would improve graduates' employability, innovation capacity, and readiness for the demands of the modern digital economy.

However, the research also sought to test the hypotheses that there is no significant difference in the level of digital literacy among graduate students in Gulu University using Chi-square test of goodness of fit since literacy levels among graduate students is a measure of association and presented both descriptive and inferential statistical analysis results as follows.

Hypothesis one: There is no significant difference in the level of digital literacy among graduate students in Gulu University.

In order to test the hypothesis that there is no significant difference in level of digital literacy among the graduate students, a Chi-square test for goodness of fit was used.

The major assumptions of χ^2 –test of goodness of fit: the data should be frequency data which is either nominal or ordinal, individual events or observations must be independent of each other, the observations recorded should be on a random basis, the overall frequency should be at least 50 and the expected frequencies have to be at least greater than 5. In this case the overall frequency was 180 which is greater than 50, hence meeting the threshold value. The responses on digital literacy skills are on a five-point Likert scale which generated ordinal data and further meeting the requirements for goodness of fit test. The expected frequencies for all the digital literacies were 36 which are greater than 5, threshold value for goodness of fit test. The data overall, met the assumptions of χ^2 –test of goodness of fit.

In the table 3 and 4, observed frequency is represented by O, expected frequency by E and the standardized residual by R of the responses for a particular digital literacy were grouped as: strongly disagree + disagree = disagreement while agree + strongly agree = agreement.

Table 3: Summary of Descriptive Statistics on Information literacy and Media Literacy as digital literacy skills.

Information Literacy	**Disagreement**	**Agreement**
computer and other digital tools	18	154
internet to collect information	13	156
manage & transform online data	16	137
WhatsApp and google scholars	10	143
copy and edit online information	14	146
evaluate online data and applications	17	144
Use of academic search engines & websites	16	137
present data using tools like spread sheets	16	136
use SPSS for both descriptive & inferential data	21	106
Media Literacy	**Disagreement**	**Agreement**
knowledge on hard wares and soft wares	16	136
Zoom and google classrooms usage	14	135
reliable information & misinformation of electronic data	12	116
make sense of electronic data	22	112
capacity to evaluate the credibility of online data	23	120
analyse digital contents	14	134
interpret digital information	13	145

Table 4: Summary of Descriptive Statistics on Communication/ Collaboration literacy and Digital Citizenship, Cyber Safety Literacy and Digital Content creation

Communication And collaboration Literacy	**Disagreement**	**Agreement**
effectively use digitals to communicate	15	149
share knowledge effectively online	14	138
collaborate in Google work spaces	15	133
knowledge of transforming media data	17	123
co-create new concepts, ideas & knowledge	17	132
ability to do web designing and publishing	33	104
Digital Citizenship & Cyber Safety Literacy	**Disagreement**	**Agreement**
Cyber Safety protocols	38	101
I can behave ethically when online	8	147
creating storage password	11	150
copyright rules	19	137
plagiarism is unethical behavior	19	137
digital responsibility and rights	14	144
Artificial Intelligence tools	12	149
identify the signs of online bullying	13	120
unethical implications of interaction	19	133
Content Creation/ Technical Literacy	**Disagreement**	**Agreement**
create online educational & scholarly contents	21	127
edit and share digital scholarly contents	17	129
design websites	36	100
navigation and orientation skills of online data	20	124
computer training	24	133
publish &do peer review of digital information	23	120

This data presents the frequency counts of respondents who either agreed or disagreed with statements across all the five digital literacy dimensions: Information Literacy, Media Literacy, Communication and Collaboration Literacy, Digital Citizenship and Cyber Safety Literacy, and Digital Content Creation & Technical Literacy. The total number of respondents per item varies slightly, suggesting possible missing responses in some items within the different domains.

Across all nine items under Information Literacy, agreement responses consistently and substantially outnumbered disagreement responses, showing generally high level of self-reported digital information competency among respondents in this digital literacy domains. The highest agreement was recorded for the item on using the internet to collect information which was recorded as (n = 156), followed by using computers and other digital tools (n = 154). These figures suggest that basic internet and computer skills are widely held among the graduate students. Using WhatsApp and Google Scholar (n = 143) and copying and editing online information (n = 146) also attracted strong agreement from the respondents. The item with the lowest agreement in this dimension was using SPSS for both descriptive and inferential data analysis (n = 106), which also recorded the highest disagreement (n = 21). This indicates that statistical software proficiency is a relatively weaker area among respondents compared to other information literacy competencies.

Media Literacy items generally indicated lower agreement totals compared to Information Literacy, suggesting comparatively weaker competencies in this domain. The highest agreement was recorded for interpreting digital information (n = 145), while the lowest was for making sense of electronic data (n = 112). The items on capacity to evaluate the credibility of online data (n = 120) and understanding reliable information versus misinformation of electronic data (n = 116) also had relatively lower agreement scores,

pointing to challenges respondents experience with critical evaluation of digital content. Notably, making sense of electronic data (disagreement = 22) and capacity to evaluate the credibility of online data (disagreement = 23) had the highest disagreement counts in this dimension, further confirming that critical media literacy skills — particularly those involving evaluation and sense-making are areas of relative weakness

In terms of Communication and Collaboration Literacy, the study reveals a generally positive trend in communication-related digital skills, with most items attracting high agreement. However, one item stood out as an area of concern. Effectively using digital tools to communicate received the highest agreement (n = 149), while ability to do web designing and publishing had the lowest agreement (n = 104) and the highest disagreement (n = 33) in the entire dimension. This is the only item in this category where over 30 respondents expressed disagreement, suggesting that web design and publishing is a specialized skill that many respondents have not yet developed. Sharing knowledge effectively online (n = 138) and collaborating in Google Workspaces (n = 133) showed moderate to strong agreement, reflecting reasonably good collaborative digital competencies overall.

In terms of Digital Citizenship and Cyber Safety Literacy, the study showed that this dimension contains the most diverse spread of responses across items. Most items showed strong agreement, indicating a generally good understanding of digital citizenship responsibilities. The highest agreement was for creating storage passwords (n = 150) and behaving ethically when online (n = 147), followed closely by using Artificial Intelligence tools (n = 149). These high scores reflect respondents' awareness of basic cyber safety practices and ethical conduct online. However, Cyber Safety protocols recorded the highest disagreement (n = 38) across all items in the entire dataset. This is a notable finding while respondents largely agree on general ethical behavior and password creation, practical

knowledge of cyber safety protocols appears to be lacking for a significant number. Plagiarism being an unethical behavior and copyright rules each attracted disagreement from 19 respondents, which warrants attention from an academic integrity perspective.

In line with Digital Content Creation and Technical Literacy, the study revealed some of the lowest agreement scores and highest disagreement scores across the entire survey, indicating that technical and creative digital production skills are the weakest area among respondents. Designing websites attracted the highest disagreement (n = 36) and the lowest agreement (n = 100) in this dimension and the second highest disagreement across all items in the study. This closely mirrors the finding on web designing in the Communication and Collaboration Literacy dimension, reinforcing that web design is a widely underdeveloped skill. Publishing and doing peer review of digital information (disagreement = 23, agreement = 120) and computer training (disagreement = 24, agreement = 133) also showed notable gaps. The relatively lower agreement on navigation and orientation skills of online data (n = 124) and creating online educational and scholarly contents (n = 127) further suggests that higher-order digital production skills need targeted capacity building.

Overall, the descriptive statistics indicated that respondents demonstrate stronger competencies in basic digital skills such as internet use, communication, ethical behaviour online, and password creation and weaker competencies in advanced technical and critical skills, including SPSS usage, cyber safety protocols, web design, content creation, and evaluating the credibility of online information. The areas with the highest disagreement count across the entire dataset are: Cyber Safety protocols (38), Designing websites (36), Ability to do web designing and publishing (33), Making sense of electronic data (22), Capacity to evaluate the credibility of online data (23), and Computer training (24).

These findings collectively suggest that while foundational digital literacy is relatively well-established among the study population, there is a significant need for structured training and capacity development in technical, critical, and content creation digital competencies.

The inferential statistics result on the Chi-Square Test for goodness of fit for the different Digital Literacy Skills of Graduate Students of Gulu University is summarized in Table 5 and 6.

Table 5: Summery of chi-Square Test of Goodness of Fit Results on Information Literacy and Media Literacy as Digital Literacy Skills.

Information Literacy	**Chi-square value**	**Df**	**Assymp.sig**
computer and other digital tools	157.111	4	0.000
internet to collect information	167.278	4	0.000
manage & transform online data	138.056	4	0.000
What Sapp and Google scholars	140.833	4	0.000
copy and edit online information	155.278	4	0.000
evaluate online data and applications	169.111	4	0.000
Use of academic search engines & websites	144.389	4	0.000
present data using tools like graphs, spread sheets	133.611	4	0.000
use SPSS for both descriptive & inferential data	71.111	4	0.000
Media Literacy	Chi-square value	df	Assymp.sig
knowledge on hard wares and soft wares	155.611	4	0.000
Zoom and Google classrooms usage	144.778	4	0.000
reliable information & misinformation of electronic data	113.444	4	0.000
make sense of electronic data	85.111	4	0.000
capacity to evaluate the credibility of online data	95.111	4	0.000
analyses digital contents	121.500	4	0.000
interpret digital information	142.944	4	0.000

This data presents the frequency counts of respondents who either agreed or disagreed with statements across all the five digital literacy dimensions: Information Literacy, Media Literacy, Communication and Collaboration Literacy, Digital Citizenship and Cyber Safety Literacy, and Digital Content Creation & Technical Literacy. The total number of respondents per item varies slightly, suggesting possible missing responses in some items within the different domains.

Across all nine items under Information Literacy, agreement responses consistently and substantially outnumbered disagreement responses, showing generally high level of self-reported digital information competency among respondents in this digital literacy domains. The highest agreement was recorded for the item on using the internet to collect information which was recorded as (n = 156), followed by using computers and other digital tools (n = 154). These figures suggest that basic internet and computer skills are widely held among the graduate students. Using WhatsApp and Google Scholar (n = 143) and copying and editing online information (n = 146) also attracted strong agreement from the respondents. The item with the lowest agreement in this dimension was using SPSS for both descriptive and inferential data analysis (n = 106), which also recorded the highest disagreement (n = 21). This indicates that statistical software proficiency is a relatively weaker area among respondents compared to other information literacy competencies.

Table 6: Summery of chi-Square Test of Goodness of Fit Results on Communication and Collaboration, Digital Citizenship and Cyber Safety; and Digital Content creation as digital literacy skills

Communication and Collaboration Literacy	**Chi-square value**	**Df**	**Assymp.sig**
effectively use digitals to communicate	150.278	4	0.000
share knowledge effectively online	120.111	4	0.000
collaborate in Google work spaces	136.389	4	0.000
knowledge of transforming media data	104.667	4	0.000
co-create new concepts, ideas & knowledge	116.611	4	0.000
ability to do web designing and publishing	49.333	4	0.000
Digital Citizenship and Cyber Safety	**Chi-square value**	**Df**	**Assymp.sig**
Cyber Safety protocols	32.444	4	0.000
I can behave ethically when online	151.778	4	0.000
creating storage password	145.722	4	0.000
copyright rules	112.944	4	0.000
plagiarism is unethical behavior	106	4	0.000
digital responsibility and rights	138	4	0.000
Artificial Intelligence tools	141.111	4	0.000
identify the signs of online bullying	87.611	4	0.000
unethical implications of interaction	105.944	4	0.000
Digital Content Creation & Technical Literacy	**Chi-square value**	**Df**	**Assymp.sig**
create online educational & scholarly contents	141.056	4	0.000
edit and share digital scholarly contents	146.611	4	0.000
design websites	53.778	4	0.000
navigation and orientation skills of online data	117.611	4	0.000
computer training	106.778	4	0.000
publish &do peer review of digital information	90.222	4	0.000

The Asymp. Sig. (2-Sided) of each of Digital literacy skills among graduate students in Gulu University in (Column 4 Table 5 and Table 6) are less than 0.05 (the threshold); $p < 0.05$. Consequently, H_o is rejected. There is, therefore, a significant difference in the level of Digital literacy skills among graduate students in Gulu University. However, since H_o is rejected, the standardized residuals (R) for the Digital literacy skills among graduate students in Gulu University were also calculated.

The threshold for standardized residuals is 2, thus any cell with *R* of more than 2 makes a strong contribution to the observed results. *R* values have been calculated because Chi-square goodness of fit does not indicate what specifically is significant.

A χ^2 –test for goodness of fit was run to establish if there is no difference in the level of Digital literacy skills among graduate students in Gulu University. The test was significant since all the individual Digital literacy skills among graduate students in Gulu University had $p< 0.05$ (that is, 0.000). Since for each Digital literacy skills among graduate students in Gulu University, the asymptotic significance value was < 0.05; Ho is rejected. There is, therefore, a significant difference in the Digital literacy skills among graduate students in Gulu University in the population from which the sample of 180 respondents were drawn Gulu University.

Since the null hypothesis was rejected, it implies that there are other particular cells that are more contributing to the result than others for the individual Digital literacy skills among graduate students in Gulu University and so the *R* values in these cases cannot be ignored.

For information literacy, on computer and other digital tools, use of internet to collect information, manage & transform online data, use WhatsApp and Google scholars, copy and edit online information, evaluate online data and applications, Use academic search engines and websites and present data using tools like graphs, spread sheets etc., the standardized residual (*R*) corresponding to the cells of agreeing and Disagreeing are all greater than 2, (the

threshold for standardized residuals) while for use of SPSS for both descriptive and inferential data, the cells of not sure, agree and strongly agree have R>2 , hence this cells make particularly strong contribution in the result on information literacy as a digital literacy skill.

In terms of media literacy, in regards to having knowledge on hard wares and soft wares the cell of has R>2, according to the use of Zoom and Google classrooms usage, the standardized residual (*R*) corresponding to the cells of agreeing and strongly agreeing is greater than 2, for reliable information & misinformation of electronic data, the standardized residual (*R*) corresponding to the cells of not sure and agreeing are R>2, for making sense of electronic data, the standardized residual (*R*) corresponding to the cell of not sure and agreeing the are R>2. On capacity to evaluate the credibility of online data, the standardized residual (*R*) corresponding to the cell of agreeing is R>2. Meanwhile on analyses of digital contents, standardized residual (*R*) corresponding to the cells of agreeing and strongly agreeing is R>2. In the last item for this domain which is interpreting digital information, the standardized residual (*R*) corresponding to the cells of agreeing and strongly agreeing have R>2.

For Communication and Collaboration Literacy, in terms of effectively using digitals to communicate, share knowledge effectively online and share knowledge effectively online, the standardized residual (*R*) corresponding to the cells of agreeing and strongly agreeing is R>2, while knowledge of transforming media data, the standardized residual (*R*) corresponding to the cells of not sure, agreeing and strongly agreeing are all R> 2. For co-creating new concepts, ideas and knowledge, the standardized residual (*R*) corresponding to the cells of agreeing is R> 2 and ability to do web designing and publishing has got the standardized residual (*R*) corresponding to the cells of not sure and agreeing R>2.

For Digital Citizenship and Cyber Safety, as on Cyber Safety protocols the standardized residual (*R*) corresponding to the cells of not sure, agreeing and strongly agreeing are R>2. On how to behave ethically when online, creating storage password, copyright rules, plagiarism is

unethical behaviour; the standardized residual (*R*) corresponding to the cells of agreeing and strongly agreeing are all R>2 the threshold for standardized residuals), for digital responsibility and rights, the standardized residual (*R*) corresponding to the cells of not sure, agreeing and strongly agreeing are R>2. Regarding Artificial Intelligence tools, the standardized residual (*R*) corresponding to the cells of agreeing and strongly agreeing are R>2. While with identify the signs of online bullying, the standardized residual (*R*) corresponding to the cells of not sure, agreeing and strongly agreeing are R>2. Lastly, on unethical implications of interaction, the standardized residual (*R*) corresponding to the cells of agreeing and strongly agreeing are R>2. Hence this cell makes particularly strong contribution in the result on digital citizenship and cyber safety as a digital literacy skill.

Under Digital Content Creation & Technical Literacy, in regards to create online educational & scholarly contents, the standardized residual (*R*) corresponding to the cell of agreeing is R>2; for edit and share digital scholarly contents, the standardized residual (*R*) corresponding to the cell of agreeing is also R>2. Meanwhile with the case of design websites, standardized residual (*R*) corresponding to the cells of not sure and agreeing is also R>2. According to navigation and orientation skills of online data, the standardized residual (*R*) corresponding to the cell of agreeing is R>2. Lastly for computer training and publish &do peer review of digital information, standardized residual (*R*) corresponding to the cells of agreeing and strongly agreeing are R>2. This cell makes particularly strong contribution in the result on Digital Content Creation & Technical Literacy as a digital literacy skill.

4.3. Research Question Two

What are the graduate studies completion levels in Gulu?

Table 7 below present's descriptive statistics on graduate studies completion levels among respondents. The findings reveal a generally low level of timely completion of graduate studies, as evidenced by low mean scores on positive completion indicators and high mean scores on factors associated with delays and non-completion.

Table 7: Showing Graduate Studies Completion Levels

Descriptive Statistics				
	Minimum	Maximum	Mean	Std. Deviation
I can publish and do peer review of digital information	*1.00*	*5.00*	*3.7056*	*1.05012*
I completed my graduate studies within the prescribed time	*1.00*	*5.00*	*1.9778*	*.85845*
I meet most academic deadline on time during my studies	*1.00*	*4.00*	*1.9833*	*.72061*
I completed all my course work requirements within the expected timeframe during my studies	*1.00*	*5.00*	*2.4611*	*.97662*
I submitted my dissertation/ thesis according to the approved schedule	*1.00*	*5.00*	*2.0444*	*.81756*
I maintained steady academic progress throughout my studies	*1.00*	*4.00*	*2.0500*	*.70334*
I was able to balance my academic responsibilities effectively	*1.00*	*5.00*	*2.2222*	*.85584*
My research activities progressed according to the planned timeline	*1.00*	*22.00*	*2.2167*	*1.67223*
I received sufficient academic support to complete my studies	*1.00*	*5.00*	*2.1000*	*.89130*

I encounter few academic obstacles that delayed my studies	*1.00*	*5.00*	*2.7444*	*1.20577*
Generally, my graduate studies were completed on time	*1.00*	*5.00*	*2.0111*	*.98019*
I experienced significant delays in completion of my studies	*1.00*	*5.00*	*3.9889*	*.79796*
I struggled to meet important academic deadlines	*2.00*	*5.00*	*4.2611*	*.51093*
Financial challenges interfered with my ability to complete my studies	*2.00*	*5.00*	*4.2667*	*.52427*
Work responsibility affected my progress towards my studies	*3.00*	*5.00*	*4.1889*	*.50460*
Family obligations contributed to delays in my studies	*2.00*	*5.00*	*4.2444*	*.60373*
Research related challenges hindered completion of my studies	*3.00*	*5.00*	*4.1889*	*.58652*
Limited academic supervision contributed to my delays	*3.00*	*5.00*	*4.1889*	*.58652*
Institutional or administrative challenges affected my progress	*3.00*	*5.00*	*4.1500*	*.55406*
At some point, I considered withdrawing from the programme	*2.00*	*5.00*	*4.0111*	*.65150*
I was unable to complete my graduate studies within the expected time.	*3.00*	*5.00*	*4.1611*	*.56096*

The results indicate that respondents largely disagreed that they completed their graduate studies within the prescribed time (Mean = 1.98, SD = 0.86). Similarly, respondents reported low levels of meeting academic deadlines on time (Mean = 1.98, SD = 0.72), submitting dissertations or theses according to approved schedules (Mean = 2.04, SD = 0.82), maintaining steady academic progress (Mean = 2.05, SD = 0.70), and receiving sufficient academic support to complete their studies (Mean = 2.10, SD = 0.89).

Likewise, respondents expressed low agreement that they were able to balance academic responsibilities effectively (Mean = 2.22, SD = 0.86), that their research activities

progressed according to planned timelines (Mean = 2.22, SD = 1.67), and that they completed all coursework requirements within the expected timeframe (Mean = 2.46, SD = 0.98). The overall statement that graduate studies were completed on time also received a low mean score (Mean = 2.01, SD = 0.98), confirming that timely completion was generally not achieved.

Conversely, respondents strongly agreed that they experienced significant delays in completing their studies (Mean = 3.99, SD = 0.80). High levels of agreement were also recorded regarding challenges that contributed to delayed completion, including financial constraints (Mean = 4.27, SD = 0.52), struggles in meeting academic deadlines (Mean = 4.26, SD = 0.51), family obligations (Mean = 4.24, SD = 0.60), work responsibilities (Mean = 4.19, SD = 0.50), research-related challenges (Mean = 4.19, SD = 0.59), limited academic supervision (Mean = 4.19, SD = 0.59), and institutional or administrative challenges (Mean = 4.15, SD = 0.55).

Furthermore, respondents agreed that they were unable to complete their graduate studies within the expected timeframe (Mean = 4.16, SD = 0.56), and many indicated that they had considered withdrawing from their programs at some point (Mean = 4.01, SD = 0.65). These findings suggest that graduate students faced multiple academic, personal, financial, and institutional barriers that adversely affected their study completion.

The findings demonstrate that graduate studies completion levels were generally low among the respondents. Specifically, most respondents did not complete their graduate studies within the prescribed time, many failed to meet academic deadlines, complete coursework on schedule and submit dissertations or theses according to approved timelines, respondents reported inadequate academic support and difficulties in balancing academic responsibilities and significant delays in programme completion were commonly experienced.

The major factors contributing to delayed completion included financial challenges (Mean = 4.27), difficulty meeting academic deadlines (Mean = 4.26), family obligations (Mean = 4.24), work responsibilities (Mean = 4.19), research-related challenges (Mean = 4.19), limited academic supervision (Mean = 4.19) and Institutional, administrative challenges (Mean = 4.15) and many students considered withdrawing from their programmes due to these challenges.

However, the hypothesis of no significant different in the graduate completion rates in Gulu University being a measure of association was tested using Chi-square test of goodness of fit and the results presented as below;

Hypothesis Two: There is no significant difference in the level of graduate completion rates in Gulu University.

In order to test the hypothesis that there is no significant difference in the level of graduate student's completion rates in Gulu University, a Chi-square test for goodness of fit was used.

The major assumptions of χ^2 –test of goodness of fit: the data should be frequency data which is either nominal or ordinal, individual events or observations must be independent of each other, the observations recorded should be on a random basis, the overall frequency should be at least 50 and the expected frequencies have to be at least greater than 5. In this case the overall frequency was 180 which is greater than 50, hence meeting the threshold value. The responses on digital literacy skills are on a five-point Likert scale which generated ordinal data and further meeting the requirements for goodness of fit test. The expected frequencies for all the digital literacies were 36 which are greater than 5, threshold value for goodness of fit test.

The data overall, met the assumptions of χ^2 –test of goodness of fit. The overall descriptive statistics on completion rate in terms of observed frequency is represented by O, expected frequency by E and the standardized residual by R were summarized and the responses for a particular digital literacy were grouped as: strongly disagree + disagree = disagreement while agree + strongly agree = agreement and is summarized in Table 8

Table 8: Summary of Descriptive Statistics on Graduate Completion Rate in Gulu University

Graduate Completion Rate	Disagreement	Agreement
I completed my graduate studies within time	154	13
I meet most academic deadline on time	153	29
I completed all course work within timeframe	116	35
I submitted my dissertation as per approved schedule	141	08
I maintained steady academic progress in my studies	147	08
I balanced my academic responsibilities effectively	133	17
My research progressed as per planned timeline	146	14
I received sufficient academic support in my studies	144	15
A few academic obstacles delayed my studies	81	68
My graduate studies were completed on time	139	17
I experienced delays in completion of my studies	05	135
I struggled to meet important academic deadlines	01	176
Financial challenges interfered my studies	01	175
Work responsibility affected my progress in studies	0	171
Family obligations contributed to delays in my studies	1	166
Research related challenges hindered my completion	0	163
Limited academic supervision led to my delays	0	163
Institutional/administrative issue affected my progress	0	164
I considered withdrawing from the programme	1	142
I was unable to complete my studies within time	0	164

This data presents the frequency counts of respondents who either agreed or disagreed with statements across completion rates for graduate students in Gulu University. The total

number of respondents per item varies slightly, suggesting possible missing responses in some items within the different domains.

Across all ten items under completion rate specifically, disagreement responses consistently and substantially outnumbered agreement responses, showing generally low level of graduate studies completion in Gulu University. The highest disagreement was recorded for the item on I completed my graduate studies within time which was recorded as (n = 156), followed by I meet most academic deadline on time (n = 153). These figures suggest that completion of graduate studies and completion of most academic deadline are least held among the graduate students. I maintained steady academic progress in my studies (n=147), my research progressed as per planned timeline (n = 146), I received sufficient academic support in my studies (n=143) and I submitted my dissertation as per approved schedule (n=141). The item with the lowest disagreement on completion rate was on I struggled to meet important academic deadlines (n = 1), and followed by I experienced delays in completion of my studies (n = 5). This indicates that the completion rates for graduate students are generally low, due to research related problems and yet class work is usually a walk over for most students

Table 9: Summery of chi-Square Test of Goodness of Fit Results Graduate Completion Rate in Gulu University

Graduate Completion Rate	Chi-square value	Df	Assymp.sig
I completed my graduate studies within time	206.778	4	0.000
I meet most academic deadline on time,	151.600	4	0.000
I completed all course work within timeframe	137.611	4	0.000
I submitted my dissertation as per approved schedule	168.889	4	0.000
I maintained steady academic progress in my studies	151.956	4	0.000
I balanced my academic responsibilities effectively	183.056	4	0.000
My research progressed as per planned timeline,	122.067	4	0.000
I received sufficient academic support in my studies	187.944	4	0.000
A few academic obstacles delayed my studies	52.722	4	0.000
My graduate studies were completed on time	114.500	4	0.000
I experienced delays in completion of my studies	137.056	4	0.000
I struggled to meet important academic deadlines	222.000	4	0.000
Financial challenges interfered my studies	210.533	4	0.000
Work responsibility affected my progress in studies	125.233	4	0.000
Family obligations contributed to delays in my studies	155.555	4	0.000
Research related challenges hindered my completion	77.233	4	0.000
Limited academic supervision led to my delays	77.233	4	0.000
Institutional/administrative issue affected my progress	99.100	4	0.000
I considered withdrawing from the programme	132.222	4	0.000
I was unable to complete my studies within time	94.033	4	0.000

The Asymp. Sig. (2-Sided) of each of Digital literacy skills among graduate students in Gulu University in (Column 4 Table 9) are less than 0.05 (the threshold); $p < 0.05$.

Consequently, H_o is rejected. There is, therefore, a significant difference in the level of graduate student's completion rate in Gulu University. However, since H_o is rejected, the standardized residuals (R) for the graduate student's completion rate in Gulu University were also calculated.

The threshold for standardized residuals is 2, thus any cell with *R* of more than 2 makes a strong contribution to the observed results. *R* values have been calculated because Chi-square goodness of fit does not indicate what specifically is significant.

A χ^2 –test for goodness of fit was run to establish if there is no difference in the level of graduate student's completion rate in Gulu University. The test was significant since all the individual elements on graduate student's completion rate in Gulu University had $p< 0.05$ (that is, 0.000). Since for each element of graduate student's completion rate in Gulu University, the asymptotic significance value was < 0.05; Ho is rejected. There is, therefore, a significant difference in the graduate student's completion rate in Gulu University in the population from which the sample of 180 respondents were drawn Gulu University, with the majority showing a relatively heterogeneous pattern of completion rates.

Since the null hypothesis was rejected, it implies that there are other particular cells that are more contributing to the result than others for the graduate students' completion rate in Gulu University and so the *R* values in these cases cannot be ignored.

For completion of graduate studies. on completion of graduate studies within time, the standardized residual (*R*) corresponding to the cells of strongly disagreeing and agreeing are all R>2 (the threshold for standardized residuals). On meeting most academic deadline on time and completing all course work within timeframe for both descriptive and inferential data, the cells of disagreeing have R>2. On submission of dissertation as per approved schedule, the standardized residual (*R*) corresponding to cell of strongly disagree and agree are R>2. For

maintained steady academic progress in my studies, balanced my academic responsibilities effectively, balanced my academic responsibilities effectively, research progressed as per planned timeline, and receiving sufficient academic support in my studies, the standardized residual (*R*) corresponding to cells of disagree are R>2. However, with sufficient academic support in my studies, the standardized residual (*R*) corresponding to cell of strongly disagree and agreeing are R>2. Hence, these cells make particularly strong contribution in the result of completion of graduate studies in Gulu University.

4.4. Research Question Three

What is the relationship between digital literacy skills and the completion of graduate studies at Gulu University?

Table 10 below presents the results of the Pearson Product-Moment Correlation analysis conducted to establish the relationship between digital literacy skills and completion of graduate studies among graduate students at Gulu University.

Table 10: Showing the Relationship between Digital Literacy Skills and Completion of Graduate Studies (N=180)

Correlations

		Digital Literacy Skills among Graduate Students at Gulu University	Completion of Graduate Studies at Gulu University
Digital Literacy Skills among Graduate Students at Gulu University	Pearson Correlation	*1*	*-.002*
	Sig. (2-tailed)		*.980*
	N	*180*	*180*
Completion of Graduate Studies at Gulu University	Pearson Correlation	*-.002*	*1*
	Sig. (2-tailed)	*.980*	

The findings indicate a Pearson correlation coefficient of r = -0.002 between digital literacy skills and completion of graduate studies. This correlation coefficient is extremely close to zero, suggesting that there is virtually no relationship between the two variables. The negative sign indicates a very slight inverse relationship; however, the magnitude is so negligible that it has no practical significance.

The significance value (p = 0.980) is far greater than the conventional significance level of 0.05. This implies that the observed relationship is not statistically significant. Therefore,

there is insufficient evidence to conclude that digital literacy skills influence or are associated with the completion of graduate studies among the respondents.

In practical terms, the findings suggest that regardless of whether students possess high or low levels of digital literacy skills, their likelihood of completing graduate studies on time does not significantly change. Other factors beyond digital literacy may therefore play a more important role in determining graduate studies completion.

The correlation analysis revealed that there was an almost non-existent negative relationship between digital literacy skills and completion of graduate studies ($r = -0.002$), the relationship was not statistically significant ($p = 0.980 > 0.05$) and digital literacy skills did not appear to influence or predict completion of graduate studies among the respondents. The findings suggest that factors other than digital literacy skills may be responsible for variations in graduate studies completion levels.

CHAPTER FIVE

DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.0. Introduction

This chapter presents discussions arising from the investigations and findings on digital literacy skills among the graduate students at Gulu University, level of graduate studies completion at Gulu University and the relationship between digital literacy skills and the completion of graduate studies at Gulu University. Discussions were made following the research questions and conclusions are drawn based on the findings. Finally, several recommendations were made.

5.1. Discussions

This section discusses the findings; it begins with findings on digital literacy skills among the graduate students at Gulu University as presented below.

5.2. Digital Literacy Skills among Graduate Students at Gulu University

The findings of this study revealed that graduates generally possessed a high level of digital literacy skills. The strongest competencies were observed in the use of digital communication technologies, digital platforms such as WhatsApp and Google Scholar, internet-based information searching, utilization of Artificial Intelligence tools such as ChatGPT, protection of personal data, and operation of computers and other digital tools. Moderate competencies were demonstrated in data analysis, academic information searching, online collaboration, digital content creation, SPSS utilization, and digital publishing. However, weaknesses were identified in website design, cyber safety awareness, web publishing, critical evaluation of online information, and unbiased interpretation of digital content.

These findings can be understood through the Theory of Student Integration advanced by Chrysikos Ahmed and Ward (2017). The theory posits that successful student development and achievement are influenced by the extent to which learners become academically and socially integrated into their educational environment. Digital literacy constitutes an important mechanism through which students engage with academic resources, communicate with peers and lecturers, access information, and participate in learning communities. The high competence in digital communication platforms, information searching, and online collaboration found in this study suggests that graduates have acquired the digital capabilities necessary for academic integration. However, the weaknesses in evaluating information credibility, cyber safety, and advanced digital content creation indicate incomplete integration into the broader digital academic ecosystem, where critical digital citizenship and advanced technological competencies are increasingly required.

The findings are consistent with those of Erwin and Mohammed, (2022) who found that university students demonstrated strong competencies in accessing information online, using communication technologies, and engaging with digital learning platforms. Their study concluded that the widespread availability of mobile devices and internet connectivity had significantly enhanced students' basic digital skills. Similarly, the current study found that graduates were highly competent in internet searching, digital communication, and the use of common online platforms.

The findings also resonate with those of Erdat et al., (2023) who reported that higher education learners exhibited satisfactory levels of digital literacy, particularly in communication, collaboration, and information access. However, Erdat et al. (2023) observed deficiencies in advanced digital skills such as content development, critical evaluation of online information, and cyber security awareness. These observations mirror the present study's

findings where respondents showed lower competence in website design, cyber safety protocols, and assessing the credibility of online information.

Likewise, the findings support those of Meiou, (2025) who found that students increasingly rely on artificial intelligence tools, online databases, and digital communication platforms to support academic activities. Meiou, (2025) noted that while learners were proficient in utilizing digital technologies for information access and communication, they often lacked the critical digital literacy skills required to evaluate the reliability and accuracy of information obtained from online sources. This aligns closely with the current study, where graduates reported high proficiency in using ChatGPT and digital platforms but lower competence in evaluating online information and interpreting digital content without bias.

Furthermore, the study corroborates the findings of (Uddin et al., 2026) who established that students possessed moderate to high levels of digital literacy, particularly in communication, collaboration, and information retrieval. However, their study identified significant gaps in cyber security knowledge, digital content production, and advanced technical skills such as web development. The present study similarly found low levels of competence in cyber safety protocols, web design, and digital publishing.

The findings are also in agreement with those of Carabregu-Vokshi et al., (2024) who concluded that although students demonstrated strong operational and communication-related digital skills, many lacked advanced competencies associated with digital content creation, critical information literacy, and ethical digital engagement. The current findings reinforce this observation, showing that graduates were proficient in basic and intermediate digital skills but less competent in advanced digital tasks requiring higher-order critical thinking and technical expertise.

Despite the consistency of these findings with previous studies, an alternative perspective suggests that high levels of digital literacy may not necessarily reflect genuine digital competence. Critics argue that students' frequent use of smartphones, social media platforms, and AI tools may create an illusion of digital proficiency while masking deficiencies in deeper technical, analytical, and evaluative skills. From this perspective, competence in WhatsApp, Google Scholar, and ChatGPT usage may represent functional familiarity rather than comprehensive digital literacy. Therefore, the relatively low scores in website design, cyber safety, and information evaluation may indicate that graduates possess surface-level digital skills rather than the advanced competencies required for effective participation in the knowledge economy.

5.3. Graduate Studies Completion rate in Gulu University

The findings of this study revealed that graduate studies completion levels were generally low among respondents. Most students failed to complete their studies within the prescribed time, experienced difficulties in meeting academic deadlines, delayed coursework completion, and submitted dissertations or theses later than scheduled. The study further established that financial constraints, family obligations, work responsibilities, research challenges, inadequate academic supervision, and institutional barriers significantly contributed to delayed completion. Consequently, many students considered withdrawing from their programmes.

The findings are consistent with those of Grover, (2020) who found that postgraduate students frequently experienced delays in completing their studies due to competing personal, financial, and professional commitments. Grover, (2020) observed that students who struggled to balance employment, family responsibilities and academic demands often required additional time to complete their programmes. The present study similarly found that work

responsibilities, family obligations, and financial challenges were among the strongest factors contributing to delayed completion of graduate studies.

The findings also agree with those of Wissame, B., & Teqwa, D. (2025), who reported that inadequate academic support and weak supervisory relationships were significant predictors of delayed programme completion and student attrition. According to Wissame, B., & Teqwa, D. (2025), students who lacked sufficient academic guidance often experienced reduced motivation and difficulties progressing through key academic milestones. This observation resonates with the current study, where respondents reported inadequate academic support and limited academic supervision as major barriers to timely completion.

Similarly, the findings corroborate those of Koch and Fehlmann, (2025) who found that institutional inefficiencies, administrative bottlenecks, and delays in supervisory feedback significantly prolonged postgraduate completion timelines. Their study highlighted that even academically capable students encountered delays when institutional systems failed to provide timely support and efficient administrative processes. The current study supports this position, as respondents identified institutional and administrative challenges as key contributors to delayed completion.

The findings further align with those of (Viđak et al., 2017) who established that research-related challenges, including difficulties in research design, data collection, analysis, and thesis writing, frequently delayed postgraduate completion. Their study emphasized that research complexity often becomes a significant obstacle during the final stages of graduate programmes. Likewise, respondents in the current study reported that research-related challenges substantially hindered the timely completion of their studies.

In addition, the findings support those of Blagg, (2018) who found that financial difficulties were among the strongest predictors of delayed completion and programme

withdrawal among graduate students. Blagg, (2018) argued that tuition costs, research expenses, and other financial obligations often force students to reduce study time or temporarily suspend academic activities. Consistent with this view, the present study identified financial challenges as one of the most influential factors affecting completion rates.

The study findings are also in agreement with those of McLaughlin, (2020) who reported that students who struggled to meet academic deadlines and balance multiple responsibilities were more likely to experience extended completion periods and consider withdrawing from their programmes. McLaughlin, (2020) noted that time management challenges often accumulate over the duration of postgraduate studies, resulting in delayed progression. This observation mirrors the current findings where respondents reported frequent difficulties in meeting deadlines and balancing academic responsibilities.

Furthermore, the findings resonate with those of (Atibuni et al., 2017) who found that postgraduate students in Uganda faced challenges related to inadequate supervision, limited institutional support, financial constraints, and competing family and work responsibilities. (Atibuni et al., 2017) concluded that these factors significantly reduced the likelihood of timely completion. The present study confirms these findings, indicating that both individual and institutional factors contributed to delayed completion among graduate students.

Although the findings attribute low completion rates to financial, institutional, supervisory and personal challenges, an alternative explanation is that delayed completion may be primarily driven by students' individual motivation, commitment and self-regulation rather than external factors. Proponents of this perspective argue that students facing similar financial, family, and institutional circumstances often complete their studies on time because of strong time-management skills, persistence, and personal discipline. From this viewpoint, delays may reflect differences in students' academic engagement and personal responsibility rather than deficiencies in institutional support systems. Therefore, while external barriers undoubtedly

exist, individual student characteristics may play a more substantial role in determining graduate studies completion than is often acknowledged.

5.4. Relationship between Digital Literacy Skills and the Completion of Graduate Studies at Gulu University

The findings of this study revealed that there was an almost non-existent negative relationship between digital literacy skills and completion of graduate studies ($r = -0.002$, $p = 0.980$). The correlation was statistically insignificant, indicating that digital literacy skills did not influence or predict the completion of graduate studies among respondents. The results suggest that regardless of the level of digital literacy possessed by graduate students, their likelihood of completing their studies within the expected timeframe remained largely unchanged. Consequently, other factors beyond digital literacy appear to be more important determinants of graduate studies completion.

These findings resonate with those of Jeno Danielsen and Raaheim, (2018) who found that while digital technologies enhance access to learning resources and facilitate student engagement, they do not automatically translate into improved academic outcomes or programme completion. Their study emphasized that factors such as student motivation, academic support, and learning environments play a more significant role in determining educational success than technological competencies alone. This supports the current study's finding that digital literacy skills did not significantly influence graduate studies completion.

Similarly, the findings are consistent with those of (Altun, 2021) who reported that although students with strong digital literacy skills were better able to access online learning resources and communicate academically, these competencies did not necessarily lead to faster programme completion. (Altun, 2021) argued that academic persistence and completion are influenced by a broader set of personal, institutional, and socioeconomic factors. The present

study similarly found that completion levels were largely unrelated to students' digital literacy capabilities.

The findings also agree with (Abbas et al., 2019) who concluded that digital literacy alone is insufficient to explain academic progression and completion. Their research indicated that financial resources, supervisory support, workload, and institutional effectiveness were more influential predictors of student success than technological skills. This aligns with the current findings, where no significant relationship was observed between digital literacy and graduate studies completion.

Likewise, the findings resonate with those of (Reddy et al., 2023) who found that graduate students' completion rates were primarily affected by research supervision, financial stability, time management, and institutional support rather than technological competence. Their study emphasized that digital literacy serves as a supportive tool but does not directly determine completion outcomes. This perspective is consistent with the present findings.

The study findings further support those of Wissame and Teqwa, (2025) who reported that while digital literacy enhances learning efficiency and access to information, its direct influence on programme completion remains weak when other contextual factors are considered. They found that personal commitment, family responsibilities, and institutional support structures exerted a stronger influence on completion outcomes than digital competence.

Similarly, the findings agree with Karatas and Arpaci, (2021) who found that digital literacy positively affected students' engagement with learning resources but had limited influence on long-term academic persistence and programme completion. Their study highlighted that completion decisions are shaped by complex interactions between academic, psychological and environmental factors rather than digital skills alone.

The results also correspond with those of (Rafi et al., 2019)who established that digital literacy facilitates academic performance and information access but is not a significant predictor of educational completion when factors such as motivation, financial capacity, and institutional support are considered. This finding reinforces the current study's conclusion that digital literacy skills are not directly associated with graduate studies completion.

Furthermore, the findings are supported by (Vermisli et al., 2022)who found that although students with higher digital literacy levels tended to be more comfortable using educational technologies, their completion rates were not significantly different from those of students with lower digital literacy levels. The authors concluded that completion outcomes are influenced more by personal resilience, supervisory relationships, and institutional conditions than by digital competence.

Finally, the repeated findings by Wissame and Teqwa (2025) reinforce the argument that digital literacy should be viewed as an enabling factor rather than a determining factor in graduate studies completion. While digital competencies may facilitate learning processes, they do not independently guarantee successful completion of graduate programmes.

5.4. Conclusions

Based on the Theory of Student Integration and the reviewed empirical studies, this study can conclude that graduates possess generally high levels of digital literacy, particularly in communication, information access and the use of digital technologies for academic purposes. However, significant gaps remain in advanced digital competencies, including cyber security, web development, critical evaluation of information and digital content creation. Consequently, while graduates are sufficiently equipped for basic participation in digitally mediated academic and professional environments, higher education institutions need to

strengthen training in advanced and critical digital literacy skills to enhance graduates' readiness for an increasingly complex digital world.

The study concludes that the level of timely graduate studies completion among respondents was low. Most graduates experienced substantial delays in completing their studies, with only a few managing to meet academic milestones within the prescribed timeframe. The delays were largely attributed to a combination of financial constraints, work and family commitments, research challenges, inadequate academic supervision, and institutional barriers. These findings suggest that graduate study completion is influenced not only by individual student factors but also by the level of academic and institutional support available throughout the study period.

The study concludes that there is no statistically significant relationship between digital literacy skills and completion of graduate studies at Gulu University. Although respondents generally demonstrated moderate to high levels of digital literacy, these skills did not translate into improved completion rates of graduate studies. Therefore, the null hypothesis stating that there is no significant relationship between digital literacy skills and completion of graduate studies is accepted. The low completion rates observed in the study are likely attributable to other factors such as financial constraints, work commitments, family responsibilities, research challenges, inadequate academic supervision, and institutional barriers rather than digital literacy competencies.

5.5. Recommendations

Universities should strengthen digital literacy programmes by incorporating advanced training in cyber security, website development, digital content creation, critical evaluation of online information, and ethical use of emerging technologies such as Artificial Intelligence. This would help bridge the gap between basic digital competence and advanced digital literacy

skills required for effective participation in contemporary academic, research, and professional environments.

Universities should strengthen graduate student support systems by establishing structured academic supervision, flexible study schedules, and financial support mechanisms. Improved supervision and timely academic guidance, coupled with interventions to address financial and administrative barriers, would enhance students' ability to meet academic milestones and complete their graduate studies within the prescribed timeframe.

Since digital literacy skills were found not to significantly influence graduate studies completion, Gulu University should focus on addressing the major barriers to completion, particularly financial challenges, inadequate academic supervision, and institutional delays, through enhanced student support services, timely supervision, and streamlined administrative processes to improve graduate completion rates.

5.6. Suggestions for Future Studies

1) Digital Literacy and Academic Performance among Graduate Students at the University
2) Influence of Academic Supervision on Completion of Graduate Studies at the University
3) Financial Availability and Completion of Graduate Studies at the University

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APPENDICES

APPENDIX A: CONSENT FORM

Dear Respondent,

I am Omwony Dickens, a student of Gulu University Perusing a Master of Education in Education Management. I am conducting a study titled *"Digital Literacy and Completion Rate among Graduate Students at Gulu University."* The study is purely for academic purposes. Your participation is voluntary, feel free to answer the questions. You have a right to take part in this or not to. Your records and identity will be kept confidential at all times. (Do not write your names)

This study is to help the researcher to achieve his Master of Education in Education Management of Gulu University.

I kindly request you to participate in the study by answering the questions that will be asked to you.

I understand that my participation is voluntary and that I may withdraw at any time without penalty. I am assured that my responses will remain confidential and anonymous.

Signature/Thumbprint…… Date……

Researcher signature…….. Date……

APPENDIX B: RESEARCH QUESTIONNAIRE FOR GRADUATE STUDENTS

Section A: Demographic Information

1. Gender

☐ Male ☐ Female ☐ Prefer not to say

2. Age Group

☐ Below 25 years ☐ 25–30 years ☐ 31–35 years

☐ 36–40 years ☐ Above 40 years

3. Marital Status

☐ Single ☐ Married

☐ Divorced ☐ Widowed

4. Program of Study

☐ Master's Degree ☐ Postgraduate Diploma

☐ PhD ☐ Other (Specify)

5. Field of Specialization

6. Year of Study

☐ Year 1 ☐ Year 2

☐ Year 3 ☐ Other (Specify)

7. Mode of Study

☐ Full-time ☐ Part-time

☐ Distance / Online

8. Employment Status

☐ Employed (Full-time) ☐ Employed (Part-time)

☐ Self-employed ☐ Not employed

9. Place of Residence

☐ On-campus ☐ Off-campus (Urban)

☐ Off-campus (Rural)

☐ Delayed completion

Section B: Digital Literacy among Graduate Students at Gulu University

Indicate your level of agreement using the scale:

1 = Strongly Disagree, 2 = Disagree, 3 = Not sure, 4 = Agree, 5 = Strongly Agree

Information Literacy	**1**	**2**	**3**	**4**	**5**
I know how to use computer and other digital tools					
I know how to us the internet to collect information					
I can manage and transform online data like from internet					
I can use digital platforms like WhatsApp and google scholars					
I can copy and edit online information					
I have the ability to use and evaluate online data and applications					
I have the ability to use academic search engines and websites					
I can present data using tools like graphs, spread sheets etc					
I can use SPSS to obtain both descriptive and inferential data					
Media Literacy	**1**	**2**	**3**	**4**	**5**
I have knowledge on hard wares and soft wares					
Zoom and google classrooms are computer networks I can use					
I can distinguish between reliable information and misinformation of electronic data					
I can make sense of electronic data like journal articles with accuracy and no bias					
I have the capacity to evaluate the credibility of online data					
I can analyze digital contents					
I can interpret digital information					

Communication and Collaboration Literacy	**1**	**2**	**3**	**4**	**5**
I can effectively use digitals to communicate					
I can share knowledge effectively online with friends through online platforms like zoom					
I can collaborate in google work spaces including google classroom					
I have the knowledge of transforming media data					
I can co-create new concepts, ideas and knowledge online					
I have the ability to do web designing and publishing					
Digital Citizenship and Cyber Safety Literacy	**1**	**2**	**3**	**4**	**5**
I understand Cyber Safety protocols					
I can behave ethically when online					
I can protect my personal data by creating storage password					
I can observe copyright rules					
I understand that plagiarism is unethical behavior					
I can take digital responsibility and rights					
I can use Artificial Intelligence tools like Chat GPT wisely					
I can identify the signs of online bullying					
I understand unethical implications of interaction on social media					
Digital Content Creation and Technical Literacy	**1**	**2**	**3**	**4**	**5**
I can create online educational and scholarly contents					
I can edit and share digital scholarly contents in presentations, videos and coding					
I can design websites					
I have navigation and orientation skills of online data					
I do computer training					
I can publish and do peer review of digital information					

Section C. Completion of Graduate Studies at Gulu University.

Indicate your level of agreement using the scale:

1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree

Timely completion	1	2	3	4	5
Graduate Students of this completes their graduate studies within the prescribed time					
Students of this university meet most academic deadline on time during my studies					
Graduate Student of this university always complete all their course work requirements within the expected timeframe during my studies					
Graduate Students of this university submittes their dissertation/ thesis according to the approved schedule					
Graduate Students in this university maintains steady academic progress throughout my studies					
Graduate students balance their academic responsibilities effectively					
Graduate students research activities in this university progresses according to the planned timeline					
Graduate students in this university receives sufficient academic support to complete my studies					
Graduate Students in this university encounter few academic obstacles that delayed my studies					
Overall, graduate studies are completed on time in this university					
Non-Completion	1	2	3	4	5
Graduate students experience significant delays in completion of my studies					
Graduate students struggle to meet important academic deadlines in this university					

Financial challenges usually interfere with students' ability to complete my studies					
Work responsibility affected students' progress towards their studies					
Family obligations contributed to delays of graduate studies in this university.					
Research related challenges hindered completion graduate studies in this university.					
Limited academic supervision contributed to delays in graduate completion in this university					
Institutional or administrative challenges affects graduate students' progress					
At some point, students considered withdrawing from their programs in this university					
Graduate students are unable to complete their graduate studies within the expected time this university					

APPENDIX C: WORK PLAN / TIME SCHEDULE

ACTIVITY	2025							2026					
	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
Topic identification	■												
Development of the concept		■											
Proposal Development			■	■	■	■							
Proposal submission							■						
Data Collection								■					
Data Analysis									■				
Report Writing										■	■		
Final Submission											■	■	■

APPENDIX D: BUDGET ESTIMATE

ITEMS	QUANTITY	UNIT COST	TOTAL COST
Photocopying and Printing of Proposal	5	20,000	100,000
Transport		Block	200,000
Internet Cost		Block	100,000
Data Analysis software		Block	350,000
Photocopying and Printing of dissertation	10	20,000	200,000
Pens		(50) 1000@	50,000
Facilitation for research assistants	3	50,000	150,000
Miscellaneous		Block	150,000
Total		**-**	**1,300,000**

APPENDIX E: MAP OF UGANDA SHOWING LOCATION OF GULU CITY



APPENDIX F: MAP SHOWING LOCATION OF GULU UNIVERSITY

