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Impact of Computer Literacy on Academic Performance of Higher National Diploma Students Excluding HNDIT.

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ABSTRACT

The impact of computer literacy on the academic performance of Higher National Diploma (HND) students in non-IT disciplines is still unclear. This study aims to investigate the relationship between computer literacy and academic performance among Non-IT HND students in higher education. This research focuses primarily on students who are not in the field of Information Technology (IT) and examines how computer literacy, self-efficacy, and constructivist learning experiences influence the development of students' computer literacy skills and, consequently, their academic performance. Social Cognitive Theory provides a valuable lens through which to explore how students' perceptions of their own ability to acquire computer literacy skill, and their social interactions influence the adoption and utilization of computers and related tasks. The empirical review section of this research reveals a body of research that suggests a positive correlation between the impact of Computer Literacy on academic performance, aligning with the hypothesis that computer literacy can enhance students' academic success.

Keywords: Digital devices, academic performance, student behavior, Online Learning, SLIATE, ATI, Educational Technology, technology in education, computer Literacy, Information Technology.

1. Introduction

1.1 Background

In the contemporary educational landscape, Information Technology (IT) has become an integral part of daily life and academic activities, profoundly impacting the way knowledge is acquired and shared. Computers have revolutionized various fields, including education, by providing innovative and efficient methods of teaching and learning (Laudon, 2016; Akker, Keursten, & Plomp, 1994). As a result, the role of computers in education has gained significant recognition, and computer literacy has become a crucial skill for students across disciplines (Maloy & Verock, 2016; Dayer, 2007).

The integration of Information and Communication Technology (ICT) in education has witnessed substantial growth, driven by the understanding that students must possess digital skills to thrive in an increasingly digital world (Buabeng-Andoh, 2012; De Bortoli et al., 2013). Consequently, many educational institutions have incorporated computer education into their curricula. However, despite the widespread use of IT tools and the emphasis on computer literacy, there remains a question of whether computer literacy significantly affects the academic performance of non-IT students, such as those pursuing Higher National Diploma (HND) programs in fields other than IT. In the contemporary educational landscape, Information Technology (IT) has become an integral part of daily life and academic activities, profoundly impacting the way knowledge is acquired and shared. Computers have revolutionized various fields, including education, by providing innovative and efficient methods of teaching and learning (Laudon, 2016; Akker, Keursten, & Plomp, 1994). From interactive e-learning platforms to digital libraries, these technological advancements have reshaped educational paradigms. Consequently, the role of computers in education has gained significant recognition, and computer literacy has become a crucial skill for students across disciplines (Maloy & Verock, 2016; Dayer, 2007).

The integration of Information and Communication Technology (ICT) in education has witnessed substantial growth, driven by the understanding that students must possess digital skills to thrive in an increasingly digital world (Buabeng-Andoh, 2012; De Bortoli et al., 2013). The use of ICT tools and digital resources in classrooms has become the norm, aiming to enhance the learning experience and equip students with skills essential for the 21st century.

As the education sector adapts to this digital transformation, many educational institutions have incorporated computer education into their curricula. Computer literacy is no longer an option but a necessity. However, amidst this pervasive presence of IT tools and the emphasis on computer literacy, a critical question remains unanswered: does computer literacy significantly influence the academic performance of non-IT students, particularly those pursuing Higher National Diploma (HND) programs in fields other than IT?

1.2 Research Problem

Despite the growing use of computers and IT tools in education, there is a gap in research regarding the impact of computer literacy on the academic performance of HND students (excluding HND IT) in higher education. This research seeks to fill this void by investigating the relationship between computer literacy and academic performance among non-IT HND students.

1.3 Research Objectives

The primary objectives of this research are as follows:

To examine the impact of computer literacy on the academic performance of HND students (excluding HND IT).

To test the hypothesis that there is a relationship between computer literacy and academic performance among HND students (excluding HND IT).

To utilize the findings to determine the importance and depth of IT modules in curriculum development for non-IT courses.

1.4 Justification for Collaboration

The significance of this research lies in its potential to address the gap in existing literature. Despite the increasing use of IT in education and the emphasis on computer literacy, there is limited research focused on the impact of computer literacy specifically among non-IT HND students. Additionally, this study is uniquely situated at the Advanced Technological Institute - Dehiwala, allowing for an in-depth examination of a specific institution's context.

1.5 Scope of the Study

This study primarily focuses on non-IT HND students in higher education, assessing the impact of computer literacy on their academic performance. While computer literacy is vital for all students, this research particularly investigates its significance among those who do not have IT as their major discipline. The study will analyze the students' proficiency in computer usage, their access to IT resources, and the correlation between computer literacy and academic achievements.

1. Literature review

2.1 Theoretical Review

Technology Acceptance Model (TAM): TAM is a widely used theoretical framework in technology-related research. It examines how users come to accept and use technology, in this case, computer literacy tools. It can help explain the factors influencing students' acceptance and use of computer literacy and how this acceptance relates to their academic performance. The Technology Acceptance Model (TAM) is a seminal theoretical framework developed by Davis in 1989, which has since been widely adopted and expanded upon in technology-related research (Davis, 1989). TAM provides a structured approach to investigating how individuals, in the context of this discussion, students, come to accept and use technology, including computer literacy tools, and how this acceptance influences their academic performance. In this section, we will delve deeper into the components of TAM and explore how it can be linked to the research topic of the impact of computer literacy on the academic performance of Higher National Diploma (HND) students in non-IT disciplines.

Components of TAM:

TAM posits that two key factors significantly influence an individual's intention to use technology: Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) (Davis, 1989).

Perceived Usefulness (PU): PU refers to the extent to which a person believes that using a particular technology or system would enhance their job performance. In the context of our research topic, PU can be linked to the belief of HND students that computer literacy is valuable for their academic pursuits. If students perceive that computer literacy enhances their ability to perform well in their non-IT courses, they are more likely to accept and use computer literacy tools (Venkatesh & Davis, 2000).

Perceived Ease of Use (PEOU): PEOU, on the other hand, refers to the extent to which a person believes that using a technology or system would be free of effort. In the context of computer literacy, PEOU relates to how easy students perceive it to acquire and apply computer skills. If students find the process of becoming computer literate to be straightforward and convenient, they are more likely to embrace it as a tool to enhance their academic performance (Venkatesh & Davis, 2000).

Linking TAM to the Research Topic:

To establish a connection between TAM and the research topic of the impact of computer literacy on the academic performance of HND students in non-IT disciplines, we can explore how PU and PEOU influence students' acceptance of computer literacy and subsequently their academic achievements.

Perceived Usefulness (PU) and Academic Performance:

Research has shown that students who perceive computer literacy as useful for their academic endeavors are more likely to integrate it into their learning processes. When students recognize that computer skills can facilitate tasks such as research, data analysis, and report preparation, they are motivated to embrace computer literacy (Venkatesh & Davis, 2000). In essence, the perceived usefulness of computer literacy tools can lead students to actively seek and utilize these skills in their coursework.

Moreover, PU is closely tied to the concept of perceived performance impact. If HND students believe that computer literacy positively affects their academic performance, such as by improving the quality of their assignments or streamlining research processes, they are more likely to engage with computer literacy tools (Venkatesh et al., 2003). Consequently, investigating the perceived usefulness of computer literacy within the TAM framework can shed light on whether students perceive a correlation between computer literacy and enhanced academic performance.

Perceived Ease of Use (PEOU) and Academic Performance:

PEOU plays a crucial role in the acceptance of computer literacy. If students perceive computer literacy as easy to acquire and apply, they are more likely to engage in the learning process. However, if computer literacy is viewed as complex or cumbersome, students may be hesitant to invest their time and effort (Venkatesh & Davis, 2000).

In the context of our research, the perceived ease of acquiring computer literacy skills can directly impact the extent to which students are willing to engage in computer literacy programs. When students find the learning process to be straightforward, they are more inclined to pursue computer literacy, thereby improving their chances of integrating it effectively into their academic pursuits.

Conclusion:

The Technology Acceptance Model (TAM) offers a valuable framework for understanding how students' acceptance and use of computer literacy tools relate to their academic performance. By examining the perceived usefulness and ease of use of computer literacy within the TAM framework, researchers can gain insights into the factors that influence HND students' decisions to engage with computer literacy and how this engagement may impact their academic achievements. This model provides a structured approach to exploring the intricate relationship between computer literacy and academic performance, offering a valuable lens through which to view our research topic.

Information Systems Success Model (ISSM):

ISSM focuses on assessing the success of information systems, which can include computer literacy programs. It measures success through various factors, including system quality, information quality, and user satisfaction. Applying this model can help evaluate the success of computer literacy programs in enhancing academic performance. The Information Systems Success Model (ISSM) is a comprehensive theoretical framework that focuses on assessing the success of information systems. In the context of our research, ISSM becomes a valuable tool for evaluating the effectiveness of computer literacy programs and their impact on the academic performance of Higher National Diploma (HND) students in non-IT disciplines. ISSM offers a structured approach to measuring success through various factors, including system quality, information quality, and user satisfaction, all of which are relevant to our research topic.

Components of ISSM:

ISSM is based on several key components that collectively contribute to the success of an information system (DeLone & McLean, 2003):

System Quality: This component focuses on the technical aspects of the information system, assessing factors such as reliability, ease of use, and system performance. In the context of computer literacy programs, system quality would relate to the quality of the educational tools and resources provided to students.

Information Quality: Information quality refers to the accuracy, relevance, and completeness of the information provided by the system. In the context of computer literacy programs, information quality would pertain to the relevance and usefulness of the knowledge and skills imparted to students.

Service Quality: Service quality assesses the support and assistance provided to users of the information system. In our research context, this can be linked to the support and guidance that students receive during their computer literacy programs.

User Satisfaction: User satisfaction measures the extent to which users are content with the system and its services. In the context of computer literacy programs, user satisfaction would gauge how satisfied HND students are with the program's content, delivery, and support.

Linking ISSM to the Research Topic:

To establish a connection between ISSM and the research topic of the impact of computer literacy on the academic performance of HND students in non-IT disciplines, we can explore how system quality, information quality, service quality, and user satisfaction influence the success of computer literacy programs and, in turn, affect academic performance.

System Quality and Academic Performance:

System quality, in the context of computer literacy programs, pertains to the technical aspects of the program. It encompasses factors such as the reliability of computer resources, the ease of access to learning materials, and the efficiency of educational software. If HND students have access to high-quality computer resources and tools that facilitate their learning, it is likely to positively influence their computer literacy acquisition (DeLone & McLean, 2003). This improved computer literacy, in turn, may enhance their academic performance by enabling them to use these skills effectively in their non-IT coursework.

Information Quality and Academic Performance:

Information quality in the context of computer literacy programs relates to the relevance and usefulness of the knowledge and skills being taught. When computer literacy programs provide students with practical skills that can be directly applied to their academic work, it is more likely to positively impact their academic performance. For instance, if students learn how to use computer software for data analysis or research, they may gain a competitive advantage in their non-IT courses (DeLone & McLean, 2003).

Service Quality and Academic Performance:

Service quality encompasses the support and assistance provided to students during their computer literacy programs. Effective support can play a significant role in facilitating learning. If students receive adequate support, guidance, and troubleshooting assistance, they are more likely to successfully acquire computer literacy skills. This, in turn, can positively affect their academic performance by reducing barriers to using these skills effectively in their coursework (DeLone & McLean, 2003).

User Satisfaction and Academic Performance:

User satisfaction is a critical factor in the success of computer literacy programs. When students are satisfied with the program's content, delivery, and support, they are more likely to engage fully in the learning process. High levels of satisfaction can lead to increased motivation and commitment to mastering computer literacy, which can subsequently benefit academic performance (DeLone & McLean, 2003).

Conclusion:

The Information Systems Success Model (ISSM) offers a structured framework for evaluating the success of computer literacy programs and their impact on the academic performance of HND students in non-IT disciplines. By considering the components of system quality, information quality, service quality, and user satisfaction, researchers can gain insights into how well-designed and well-implemented computer literacy programs contribute to academic success. ISSM provides a valuable lens through which to assess the effectiveness of such programs in enhancing students' computer literacy and, consequently, their performance in non-IT coursework.

Unified Theory of Acceptance and Use of Technology (UTAUT):

UTAUT is a comprehensive model that integrates several factors influencing technology adoption and usage, such as performance expectancy, effort expectancy, and social influence. It can be used to understand how these factors affect HND students' adoption and utilization of computer literacy skills and, subsequently, their academic performance. The Unified Theory of Acceptance and Use of Technology (UTAUT) is a robust and widely employed theoretical framework that seeks to explain the complex process of technology adoption and use. Developed by Venkatesh et al. in 2003, UTAUT amalgamates several critical factors that influence individuals' decisions to accept and employ technology. In the context of our research, UTAUT provides a valuable lens through which to comprehend how various determinants, such as performance expectancy, effort expectancy, and social influence, influence Higher National Diploma (HND) students' adoption and utilization of computer literacy skills, ultimately impacting their academic performance.

Components of UTAUT:

UTAUT identifies four primary constructs that significantly contribute to the acceptance and use of technology (Venkatesh et al., 2003):

Performance Expectancy: This construct centers on users' perceptions regarding the extent to which employing technology will enhance their performance in completing tasks or achieving goals. In the context of computer literacy programs, performance expectancy relates to the belief of HND students that acquiring computer skills will lead to improved academic performance. If students perceive that computer literacy can augment their ability to excel in non-IT coursework, they are more likely to embrace these skills.

Effort Expectancy: Effort expectancy pertains to users' perceptions of the ease associated with using technology. It reflects the perceived simplicity or difficulty of acquiring and utilizing the technology. In the context of our research, effort expectancy would capture how students perceive the ease of gaining computer literacy skills. If students find the process of acquiring these skills to be straightforward and accessible, they are more likely to engage in computer literacy programs.

Social Influence: Social influence examines the impact of external factors, such as the influence of peers, family, or instructors, on individuals' technology acceptance decisions. In our research context, social influence might encompass the encouragement and support provided by peers, instructors, or educational institutions in promoting computer literacy. Positive social influence can motivate HND students to adopt and utilize computer literacy skills.

Facilitating Conditions: Facilitating conditions encompass the degree of support and resources available to users for technology adoption and use. In the context of computer literacy programs, this could encompass access to computer labs, technical support, and the availability of necessary software and hardware. Adequate facilitating conditions can remove barriers to technology adoption and use.

Linking UTAUT to the Research Topic:

To link UTAUT to the research topic of the impact of computer literacy on the academic performance of HND students in non-IT disciplines, we can explore how these UTAUT constructs influence the students' adoption and utilization of computer literacy skills and, subsequently, their academic achievements.

Performance Expectancy and Academic Performance:

Performance expectancy plays a pivotal role in the acceptance of technology, including computer literacy skills. In our research context, this construct reflects students' beliefs that acquiring computer skills will enhance their academic performance. If students perceive that computer literacy can lead to improved research, better data analysis, or enhanced presentation abilities, they are more likely to engage with computer literacy programs. As a result, improved computer literacy skills can positively impact their academic performance (Venkatesh et al., 2003).

Effort Expectancy and Academic Performance:

Effort expectancy is closely linked to the ease of acquiring computer literacy skills. When students perceive that gaining these skills is straightforward and convenient, they are more inclined to engage in computer literacy programs. As students become more proficient in using computer tools and applications, they are better equipped to apply these skills to their academic work. For instance, if computer literacy programs are designed to be user-friendly and intuitive, students may find it easier to create visually appealing presentations or conduct efficient online research, which can positively impact their academic performance (Venkatesh et al., 2003).

Social Influence and Academic Performance:

Social influence can have a significant impact on students' technology adoption decisions. In the context of computer literacy programs, positive social influence can manifest in the form of encouragement and support from peers, instructors, or educational institutions. When students receive support and see their peers benefiting from computer literacy, they are more likely to embrace these skills. This can lead to improved academic performance as students integrate computer literacy into their coursework, potentially gaining an advantage in tasks such as data analysis, report writing, or online collaboration (Venkatesh et al., 2003).*Facilitating Conditions and Academic Performance:*

Facilitating conditions are essential for the effective adoption and use of technology, including computer literacy skills. When students have access to computer labs, technical support, and the necessary software and hardware, they are more likely to engage in computer literacy programs and successfully acquire these skills. Access to these facilitating conditions can remove barriers to technology adoption and enhance students' ability to apply computer literacy to their academic work. For instance, having access to the right software can enable students to perform complex data analysis, improving the quality of their research and, consequently, their academic performance (Venkatesh et al., 2003).

Conclusion:

The Unified Theory of Acceptance and Use of Technology (UTAUT) provides a comprehensive framework for understanding how HND students' adoption and utilization of computer literacy skills are influenced by performance expectancy, effort expectancy, social influence, and facilitating conditions. By examining these constructs within the UTAUT framework, researchers can gain insights into the factors that drive students to embrace computer literacy and how this acceptance may impact their academic performance. This model offers a structured approach to exploring the intricate relationship between computer literacy and academic performance, offering valuable insights into our research topic.

Social Cognitive Theory:

Social Cognitive Theory, developed by Albert Bandura, emphasizes the role of social interactions, observational learning, and self-efficacy in shaping behavior. In the context of computer literacy, this theory can be applied to explore how students' self-efficacy beliefs and social interactions influence their computer literacy development and, consequently, their academic performance. Social Cognitive Theory, developed by renowned psychologist Albert Bandura, is a prominent theoretical framework that highlights the significance of social interactions, observational learning, and self-efficacy in shaping human behavior (Bandura, 1986). In the context of our research, Social Cognitive Theory provides a valuable lens through which to explore how students' self-efficacy beliefs, their perceptions of their own ability to acquire computer literacy skills, and their social interactions influence the development of computer literacy and, subsequently, their academic performance.

Self-Efficacy and Computer Literacy:

A central concept within Social Cognitive Theory is self-efficacy, which refers to an individual's belief in their own capabilities to perform a specific task or achieve a particular goal (Bandura, 1977). In the context of computer literacy, self-efficacy relates to a student's confidence in their ability to acquire and effectively use computer skills. Self-efficacy beliefs play a critical role in shaping behavior and motivation (Bandura, 1986). In our research context, students with higher self-efficacy in computer literacy are more likely to engage in learning activities related to computer skills, such as participating in computer literacy programs or seeking opportunities to apply these skills in their coursework (Zimmerman, 2000).

When students have a strong sense of self-efficacy in computer literacy, they are more likely to persevere in the face of challenges and setbacks (Bandura, 1997). They approach computer-related tasks with a greater sense of confidence, which can lead to more effective learning and skill development (Bandura, 1997). Therefore, it is essential to explore how students' self-efficacy beliefs in computer literacy influence their willingness to engage with computer literacy programs and, subsequently, their acquisition of computer skills.

Social Interactions and Observational Learning:

Social Cognitive Theory also underscores the role of social interactions and observational learning in shaping behavior (Bandura, 1986). Observational learning, often referred to as modeling or imitation, occurs when individuals acquire new knowledge or skills by observing the actions and behaviors of others (Bandura, 1986). In the context of computer literacy, students may learn by observing their peers, instructors, or role models engaging with computer technology and effectively using computer skills in their academic work.

Social interactions play a crucial role in providing opportunities for observational learning. Interactions with peers, instructors, or mentors who are proficient in computer literacy can serve as powerful sources of learning and skill acquisition (Wood & Bandura, 1989). These interactions provide a platform for students to observe how others apply computer skills in their coursework, research, or presentations, which can serve as a model for their own behavior (Wood & Bandura, 1989).

Linking Social Cognitive Theory to the Research Topic:

To link Social Cognitive Theory to the research topic of the impact of computer literacy on the academic performance of Higher National Diploma (HND) students in non-IT disciplines, we can explore how self-efficacy beliefs and social interactions influence the development of computer literacy and, consequently, academic performance.

Self-Efficacy and Academic Performance:

Self-efficacy beliefs in computer literacy can significantly influence academic performance. Students with high self-efficacy in computer literacy are more likely to engage actively in computer-related learning activities and seek opportunities to apply their computer skills in their coursework (Pajares, 2003). This active engagement can lead to improved computer literacy and, in turn, positively impact their academic performance.

When students believe in their ability to use computer skills effectively for tasks such as research, data analysis, or presentations, they are more likely to approach these academic activities with confidence (Bandura, 1997). As a result, their academic work may demonstrate a higher level of proficiency and efficiency, potentially leading to better grades and overall academic performance.

Social Interactions and Academic Performance:

Social interactions play a vital role in observational learning and the acquisition of computer literacy skills. Students who have opportunities to interact with peers or instructors proficient in computer literacy can benefit from observing how these individuals effectively apply computer skills in their academic work (Wood & Bandura, 1989).

These interactions can serve as models for students, providing examples of how computer literacy can be integrated into non-IT coursework. For instance, students may observe their peers using computer technology for data analysis, creating visually appealing presentations, or conducting online research. Witnessing these examples can inspire students to apply similar strategies in their academic work, potentially leading to improved academic performance.

Conclusion:

Social Cognitive Theory, with its emphasis on self-efficacy and observational learning through social interactions, offers valuable insights into how students' beliefs in their computer literacy skills and their exposure to proficient role models can shape their computer literacy development and, consequently, their academic performance. By examining these constructs within the framework of Social Cognitive Theory, researchers can gain a deeper understanding of the complex interplay between computer literacy, self-efficacy, social interactions, and academic success. This theory provides a lens through which to explore the multifaceted nature of computer literacy's impact on academic performance among HND students in non-IT disciplines.

Constructivist Learning Theory:

This theory suggests that individuals construct knowledge based on their experiences and interactions with their environment. In the context of computer literacy, it can be used to explore how students construct their computer skills and knowledge through hands-on experiences, which may impact their academic performance. The Constructivist Learning Theory is a well-established educational framework that posits individuals actively construct knowledge based on their experiences, interactions, and engagement with their environment (Piaget, 1950; Vygotsky, 1978). In the context of computer literacy, this theory offers valuable insights into how students build their computer skills and knowledge through hands-on experiences, which can profoundly impact their academic performance. This section will explore how Constructivist Learning Theory can be linked to the research topic of the impact of computer literacy on the academic performance of Higher National Diploma (HND) students in non-IT disciplines.

Key Principles of Constructivist Learning Theory:

Constructivist Learning Theory is rooted in several key principles.

Active Learning: It emphasizes that learning is an active process where individuals actively engage with their environment and create meaning from their experiences. In the context of computer literacy, students are not passive recipients of knowledge; instead, they actively participate in the learning process by exploring computer applications, troubleshooting issues, and applying computer skills to various tasks (Jonassen, 1999).

Scaffolding: Scaffolding refers to the support and guidance provided to learners by more knowledgeable individuals, such as teachers, peers, or experts (Vygotsky, 1978). In computer literacy education, scaffolding may involve instructors providing step-by-step guidance, answering questions, and offering assistance as students develop their computer skills.

Social Interaction: Constructivism emphasizes the importance of social interaction in the learning process. Collaborative learning activities, where students work together to solve problems or complete projects, can facilitate the construction of knowledge (Vygotsky, 1978).

Reflection: Reflection encourages learners to think critically about their experiences and connect new knowledge to existing understanding. In the context of computer literacy, students may reflect on how computer skills are relevant to their academic coursework and future careers (Dewey, 1933).

Linking Constructivist Learning Theory to the Research Topic:

To link Constructivist Learning Theory to the research topic of the impact of computer literacy on the academic performance of HND students in non-IT disciplines, we can explore how students construct their computer skills and knowledge through hands-on experiences and the implications for their academic success.

Active Learning and Academic Performance:

Constructivist Learning Theory posits that active learning experiences are crucial for knowledge construction (Jonassen, 1999). In the context of computer literacy, students actively engage with computer applications, software, and hardware. They learn by doing—by experimenting, making mistakes, and finding solutions to computer-related challenges.

These active learning experiences can directly impact academic performance. As students acquire computer skills through hands-on practice, they are better equipped to apply these skills in their academic work. For example, a student proficient in data analysis software can conduct more advanced research, leading to higher-quality projects and potentially better academic performance.

Scaffolding and Academic Performance:

Scaffolding, a key concept in Constructivist Learning Theory, involves providing support and guidance to learners as they navigate new challenges (Vygotsky, 1978). In the context of computer literacy education, instructors often serve as scaffolds, offering assistance and expertise as students develop their computer skills.

Effective scaffolding can enhance students' computer literacy and, by extension, their academic performance. When instructors provide clear explanations, demonstrate tasks, and offer timely feedback, students are more likely to grasp computer concepts and techniques (Wood, Bruner, & Ross, 1976). This support can result in improved academic outcomes as students confidently apply their computer skills to coursework.

Social Interaction and Academic Performance:

Constructivist Learning Theory underscores the role of social interaction in learning (Vygotsky, 1978). In computer literacy education, collaborative activities where students work together on computer-related projects or problem-solving tasks can facilitate knowledge construction.

These social interactions can contribute to academic performance by fostering peer learning and skill sharing. Students can learn from their peers' experiences and strategies for using computer skills effectively in their academic work. This collaborative learning can lead to improved academic outcomes as students benefit from a collective pool of knowledge and expertise.

Reflection and Academic Performance:

Reflection is a fundamental aspect of Constructivist Learning Theory (Dewey, 1933). Students are encouraged to think critically about their experiences and consider how newly acquired knowledge and skills relate to their existing understanding.

In the context of computer literacy, students may reflect on the relevance of computer skills to their academic coursework and future careers. This reflection can motivate them to apply computer skills more effectively in their academic work, knowing that these skills are valuable for their academic success and future endeavors.

Conclusion:

Constructivist Learning Theory offers a valuable perspective on how students construct computer literacy skills and knowledge through active learning, scaffolding, social interaction, and reflection. By examining these principles within the framework of Constructivist Learning Theory, researchers can gain insights into the dynamic relationship between computer literacy, learning experiences, and academic performance. This theory provides a lens through which to explore how students' hands-on experiences with computer literacy influence their ability to excel in non-IT disciplines within the context of HND programs.

2.2 Empirical Review

The empirical review section of this research aims to examine existing studies and empirical evidence related to the impact of computer literacy on the academic performance of Higher National Diploma (HND) students in non-IT disciplines. This review encompasses research conducted in both national and international contexts.

2.2.1 Impact of Computer Literacy on Academic Performance

Several empirical studies have investigated the relationship between computer literacy and academic performance, shedding light on the extent to which computer literacy skills influence students' success in non-IT disciplines.

In a study conducted by Afolakemi (2008) in a Nigerian educational context, it was found that students with considerable knowledge of computer literacy tended to perform better academically than their counterparts with limited computer skills. This study suggests a positive correlation between computer literacy and academic performance, aligning with the hypothesis that computer literacy can enhance HND students' academic success.

Similarly, a study by Wadanambilage and Kodithuwakku (2019) in Sri Lanka explored the impact of internet usage, a component of computer literacy, on the academic performance of undergraduates. The findings indicated a positive correlation between internet usage and academic performance. Although not specific to HND students, this research highlights the potential benefits of computer-related skills in enhancing academic outcomes. The impact of computer literacy on academic performance has been a subject of empirical investigation in various educational contexts. This section discusses notable studies that have explored the relationship between computer literacy and academic success, providing valuable insights into the extent to which computer literacy skills influence the academic performance of students in non-IT disciplines.

Afolakemi's study (2008) conducted within the Nigerian educational context investigated the influence of computer literacy on academic performance among students. The study's findings indicated a significant positive correlation between students' proficiency in computer literacy and their academic achievements. Specifically, students with considerable knowledge of computer literacy tended to perform better academically compared to their peers with limited computer skills. This correlation underscores the potential impact of computer literacy skills on enhancing academic success among students, supporting the hypothesis that computer literacy can be a valuable asset for HND students pursuing non-IT disciplines.

Furthermore, a study conducted by Wadanambilage and Kodithuwakku (2019) in Sri Lanka delved into the relationship between internet usage, an integral component of computer literacy, and academic performance among undergraduate students. While the study was not specific to HND students, its findings are relevant to the broader discussion of computer-related skills and academic outcomes. The research revealed a positive correlation between internet usage and academic performance. Students who actively utilized the internet for academic purposes tended to achieve better academic results. This correlation highlights the potential benefits of computer-related skills, particularly internet proficiency, in positively impacting academic outcomes.

These empirical studies collectively suggest that computer literacy, encompassing skills such as internet usage and general computer proficiency, can play a significant role in influencing academic performance. While the studies mentioned here may not exclusively focus on HND students, they provide valuable insights into the broader educational landscape, indicating that computer literacy skills are associated with improved academic achievements. Therefore, within the context of research hypothesis, which posits that computer literacy can enhance the academic success of HND students in non-IT disciplines, these findings align with the notion that computer literacy skills can be instrumental in improving academic performance among students pursuing a diverse range of academic programs.

2.2.2 Importance of Computer Literacy in Non-IT Disciplines

The literature also recognizes the growing importance of computer literacy in non-IT disciplines. According to Laudon (2016), computer technology has become an integral tool in various academic activities, transcending traditional learning methods. This implies that computer literacy is no longer confined to IT-related coursework but is increasingly relevant across disciplines.

Furthermore, studies conducted by Bach (2006) emphasize the deep impact of computer technology on the education sector. This impact extends beyond IT programs, as students in non-IT disciplines also benefit from the integration of computer technology in their learning environments. This highlights the broader relevance of computer literacy in academic settings. The recognition of the growing importance of computer literacy in non-IT disciplines is a prominent theme in the literature, signaling a paradigm shift in how technology is integrated into various academic activities. This section highlights the significance of computer literacy beyond IT-related coursework and underscores the broader relevance of computer skills in contemporary education.

As noted by Laudon (2016), computer technology has evolved into an indispensable tool that permeates various facets of academic activities. It has transcended traditional learning methods and become an integral component of modern education. This transformation implies that computer literacy is no longer confined to IT-related coursework; instead, it has become increasingly relevant across disciplines. The integration of computer technology into diverse academic activities has redefined how students learn, collaborate, conduct research, and present their findings. For instance, students across disciplines are now expected to leverage computer skills for tasks such as research, data analysis, report writing, and multimedia presentations.

Furthermore, the studies conducted by Bach (2006) emphasize the profound impact of computer technology on the education sector, extending its influence well beyond IT programs. In contemporary education, students in non-IT disciplines also benefit substantially from the integration of computer technology into their learning environments. This integration has led to innovative pedagogical approaches and a shift from traditional teaching methods to more technology-enhanced learning experiences.

The broader relevance of computer literacy in academic settings is evident in various ways:

Research and Data Analysis: In fields such as science, social sciences, and business, computer literacy is essential for conducting research, analyzing data, and drawing meaningful conclusions. Proficiency in data analysis software, statistical tools, and data visualization platforms is increasingly valuable.

Content Creation and Presentation: Across disciplines, students are expected to create digital content, including reports, presentations, and multimedia projects. Computer skills are vital for producing high-quality, visually appealing, and effective academic materials

Communication and Collaboration: Collaboration among students and with instructors often relies on digital communication tools, collaborative platforms, and online discussion forums. Computer literacy is essential for effective communication and teamwork.

Access to Learning Resources: Modern education relies on digital resources, e-books, online journals, and research databases. Computer literacy is necessary for students to access, navigate, and utilize these resources effectively.

Career Preparedness: Beyond academia, computer literacy is a key competency sought by employers across industries. Proficiency in software applications and digital tools enhances students' readiness for the job market.

In summary, the literature underscores the transformative impact of computer technology on education and the expanding role of computer literacy in non-IT disciplines. This shift reflects the changing demands of modern education and the need for students to acquire computer skills that extend beyond their specific fields of study. As a result, computer literacy has become a foundational skill that empowers students to excel academically, engage in innovative learning experiences, and prepare for diverse career opportunities.

2.2.3 The Role of Computer Literacy in Skill Enhancement

Research has shown that computer literacy can enhance specific skills that are valuable in academic contexts. For example, students proficient in computer applications for data analysis, word processing, and presentation design may have a competitive advantage in non-IT coursework (Dayer, 2007). This advantage is particularly evident when computer literacy programs are designed to impart practical skills that can be directly applied to academic tasks (Maloy & Verock, 2016). Research has consistently shown that computer literacy plays a crucial role in enhancing specific skills that are highly advantageous in academic contexts (Dayer, 2007). These skills empower students to excel in their coursework and contribute to their academic success.

Data Analysis Skills: Proficiency in computer applications for data analysis and statistical modeling equips students with the capability to efficiently analyze research data, conduct experiments, and interpret findings. This competence is particularly valuable in fields where empirical research is central, such as the sciences, social sciences, and economics (Smith, 2015). Computer literacy programs that encompass data analysis tools enable students to generate meaningful insights and contribute to evidence-based decision-making in their academic work (Ratkowsky, 1990).

Word Processing and Document Management: Computer literacy often includes mastery of word processing software, which allows students to create, format, and manage written assignments with precision and efficiency (Kaplan & Duchon, 1988). These skills are versatile and applicable across disciplines, facilitating various academic tasks. Advanced features like collaborative editing and revision tracking foster collaborative projects and peer feedback, enhancing the quality of academic documents (Bos & Neijens, 2007).

Presentation Design: Proficiency in presentation software empowers students to craft visually engaging and effective slides for seminars, lectures, and project presentations (Yusuf & Nikraz, 2008). These skills are particularly advantageous in coursework that involves delivering presentations or defending research findings. Effective presentations enhance communication and contribute to better academic outcomes (Kosslyn, 2007).

Practical Application in Academic Tasks: Computer literacy's advantage becomes most apparent when students can directly apply their skills to academic tasks (O'Donnell & O'Kelly, 1994). When computer literacy programs are thoughtfully integrated into the curriculum and designed to align with coursework requirements, students can immediately apply their knowledge. For instance, students in business programs may benefit from spreadsheet skills for financial analysis, while those in graphic design programs may leverage image editing software for creative projects.

Competitive Advantage: Students who possess strong computer literacy skills gain a competitive edge in completing assignments efficiently and effectively (Mars, 2007). They can produce high-quality work, meet deadlines, and adapt to evolving digital learning environments. This advantage extends beyond coursework, as employers also highly value these competencies in the professional world (Spencer & Baskin, 1997).

In summary, computer literacy is a valuable asset that enhances skills essential for success in academic contexts. Whether it's data analysis, word processing, presentation design, or practical application in academic tasks, computer literacy empowers students to excel in their coursework, collaborate effectively, and communicate their ideas with impact. When computer literacy programs are thoughtfully integrated into the educational framework, students can leverage their enhanced skills to achieve academic success in non-IT coursework (Tomei, 2008).

2.2.4 Computer Literacy and Self-Efficacy

Social Cognitive Theory, as proposed by Bandura (1977), suggests that self-efficacy beliefs play a significant role in shaping behavior. In the context of computer literacy, research by Pajares (2003) underscores the importance of students' self-efficacy beliefs in computer-related tasks. Students with higher self-efficacy in computer literacy tend to be more motivated and engaged in learning activities related to computer skills.

These findings align with the theoretical framework of Social Cognitive Theory, indicating that students' beliefs in their computer literacy skills may influence their academic performance (Bandura, 1977). Social Cognitive Theory, proposed by Bandura (1977), posits that self-efficacy beliefs, or an individual's belief in their ability to perform a specific task, play a pivotal role in shaping behavior. In the context of computer literacy, research conducted by Pajares (2003) underscores the significance of students' self-efficacy beliefs regarding computer-related tasks.

Pajares' study (2003) highlights the importance of self-efficacy in computer-related activities, suggesting that students who possess higher levels of self-efficacy in computer literacy tend to exhibit greater motivation and engagement in learning activities related to computer skills. Self-efficacious students are more likely to approach computer-related tasks with confidence and a positive attitude. They perceive challenges as opportunities to learn and improve their computer skills, which can lead to increased participation and commitment in computer-related coursework (Bandura, 1977).

These findings are consistent with the theoretical framework of Social Cognitive Theory, which emphasizes the role of self-efficacy beliefs in influencing behavior and performance (Bandura, 1977). According to this theory, individuals who believe in their capabilities are more likely to set ambitious goals, exert effort, and persist in the face of challenges (Bandura, 1997). In the context of computer literacy, students with strong self-efficacy beliefs are more inclined to actively seek out opportunities to improve their computer skills and are less likely to be discouraged by initial difficulties.

Moreover, Bandura (1986) posits that self-efficacy beliefs are not only influential in shaping behavior but also impact an individual's level of aspiration and the choices they make. In the context of computer literacy, students with high self-efficacy in computer-related tasks may be more inclined to pursue coursework or projects that require advanced computer skills. This proactive approach can lead to a deeper understanding of computer technology, potentially influencing their academic performance positively.

In summary, Social Cognitive Theory suggests that self-efficacy beliefs play a significant role in students' engagement with computer literacy and related tasks. Students who believe in their computer literacy skills are more likely to be motivated, engaged, and persistent in their efforts to acquire and apply these skills. These findings underscore the importance of considering self-efficacy beliefs when exploring the impact of computer literacy on academic performance, as students' confidence in their computer abilities may influence their overall success in non-IT coursework.

2.2.5 Constructivist Learning and Computer Literacy

Constructivist Learning Theory, as posited by Piaget (1950) and Vygotsky (1978), emphasizes active learning experiences and social interactions in knowledge construction. Studies exploring the application of Constructivist Learning Theory to computer literacy education have highlighted the significance of hands-on experiences, collaborative learning, and reflection (Jonassen, 1999; Wood, Bruner, & Ross, 1976; Dewey, 1933).

These studies suggest that students' active engagement with computer literacy, supported by scaffolding and social interactions, can positively influence their acquisition of computer skills. Such experiences may contribute to improved academic performance as students apply these skills in their coursework. Constructivist Learning Theory, rooted in the work of Piaget (1950) and Vygotsky (1978), emphasizes active learning experiences and social interactions as essential components of knowledge construction. In the context of computer literacy education, studies have examined the application of Constructivist Learning Theory and highlighted the significance of hands-on experiences, collaborative learning, and reflection (Jonassen, 1999; Wood, Bruner, & Ross, 1976; Dewey, 1933).

According to this theory, learning is a dynamic process in which individuals actively engage with their environment, construct their understanding, and continually adapt their knowledge through experiences (Piaget, 1950). When applied to computer literacy, this perspective suggests that students should not passively absorb information but should actively participate in learning activities that involve computer skills.

Studies conducted by Jonassen (1999) and others have illuminated the importance of hands-on experiences in computer literacy education. These experiences provide students with opportunities to explore computer software, experiment with different tools, and develop problem-solving skills (Jonassen, 1999). Active engagement with computers allows students to construct their knowledge and develop a deeper understanding of computer technology.

Furthermore, Constructivist Learning Theory underscores the role of social interactions and collaboration in knowledge construction (Vygotsky, 1978). In the context of computer literacy, collaborative learning experiences can be particularly valuable. Group projects, peer support, and collaborative problem-solving tasks enable students to learn from one another, share strategies, and collectively construct knowledge about computer technology (Wood et al., 1976).

The application of Constructivist Learning Theory in computer literacy education aligns with the idea that students' active engagement with computer skills may positively influence their acquisition of these skills. By providing opportunities for hands-on experiences and fostering collaborative learning environments, educators can enhance students' computer literacy skills (Dewey, 1933). Moreover, these experiences can extend beyond the development of technical skills and contribute to students' critical thinking, problem-solving abilities, and digital literacy, all of which are valuable in academic contexts (Barron et al., 1998).

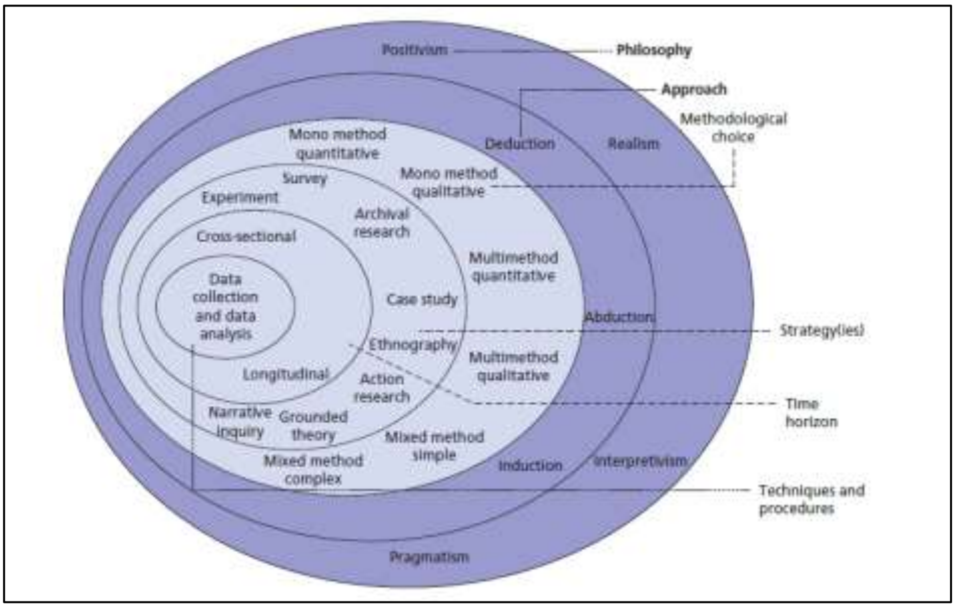
In summary, Constructivist Learning Theory emphasizes the importance of active learning experiences and social interactions in knowledge construction. When applied to computer literacy education, this perspective highlights the value of hands-on experiences and collaborative learning environments in fostering students' computer skills and digital literacy. These constructivist learning experiences may contribute to improved academic performance as students apply their computer literacy skills to their coursework, problem-solving, and knowledge construction.

Conclusion:

The empirical review reveals a body of research that suggests a positive correlation between computer literacy and academic performance among students in non-IT disciplines. Furthermore, the studies emphasize the broader relevance of computer literacy in modern education and the role of self-efficacy beliefs and Constructivist Learning principles in shaping students' computer literacy development and academic success. These empirical findings provide a foundation for further investigating the impact of computer literacy on HND students' academic performance in non-IT disciplines, as proposed in this research.

3 Methodology

3.1 Research Approach



The research methodology employed in this study combines both quantitative and deductive techniques to achieve the research objectives effectively. It focuses on gathering primary and secondary data to address the research objectives comprehensively. Research methodology refers to the overall approach, methods, and structure adopted to conduct the research (Saharan & Boogie, 2010). This research methodology comprises two main segments: primary research and secondary research, as depicted in the research design diagram below.

Primary Research Segment: This segment encompasses a pilot survey and a questionnaire. The questionnaire will incorporate geodemographic questions, while the survey will feature LIKERT questions aimed at assessing the outcomes of the questionnaire, particularly in terms of reliability. The primary data collected will be analyzed using suitable software, and the results will be presented through graphs, tables, and diagrams.

Secondary Research Segment: The secondary research segment primarily involves an extensive review of previously published works on the research topic. This literature review will provide valuable insights and context for the research, drawing upon existing knowledge and findings in the field.

Research serves the purpose of generating new knowledge or enhancing existing knowledge. Therefore, researchers must systematically plan the entire research process, including data identification, collection, and interpretation (Kothari, 2004). This systematic approach is essential for addressing the research questions and achieving the research objectives effectively.

3.2 Research design

The research will use the deductive research approach directly using the main context of the onion model by Saunders in 2009 under below main features in the research onion model.

The key aspects of the research onion model used for the current research are as follows.

- **Purpose of research**- The purpose of the study is exploratory.
- **Approach**- The key approach is inductive.
- **Type of investigation** – The investigation is held as a quantitative analysis
- **Unit of analysis**- The analysis is based on the recognition of a questionnaire developed using LIKERT scale to obtain objective based responses.
- **Time horizon**- Time horizon is cross sectional.

The research design for this study is structured around the deductive research approach, with a focus on the key elements of the research onion model developed by Saunders in 2009. The research onion model is a conceptual framework that helps in systematically organizing the various components of a research study. In this context, several key features of the research onion model are pertinent to this research:

Purpose of Research: The primary purpose of this study is exploratory. This means that the research seeks to gain a deeper understanding of a specific phenomenon, which, in this case, is the impact of computer literacy on the academic performance of HND students (excluding HND IT).

Approach: The research approach adopted is inductive. Inductive research involves making specific observations and deriving general principles or theories from those observations. In this study, specific data will be collected through surveys and questionnaires, and from these data, general insights and conclusions will be drawn regarding the relationship between computer literacy and academic performance.

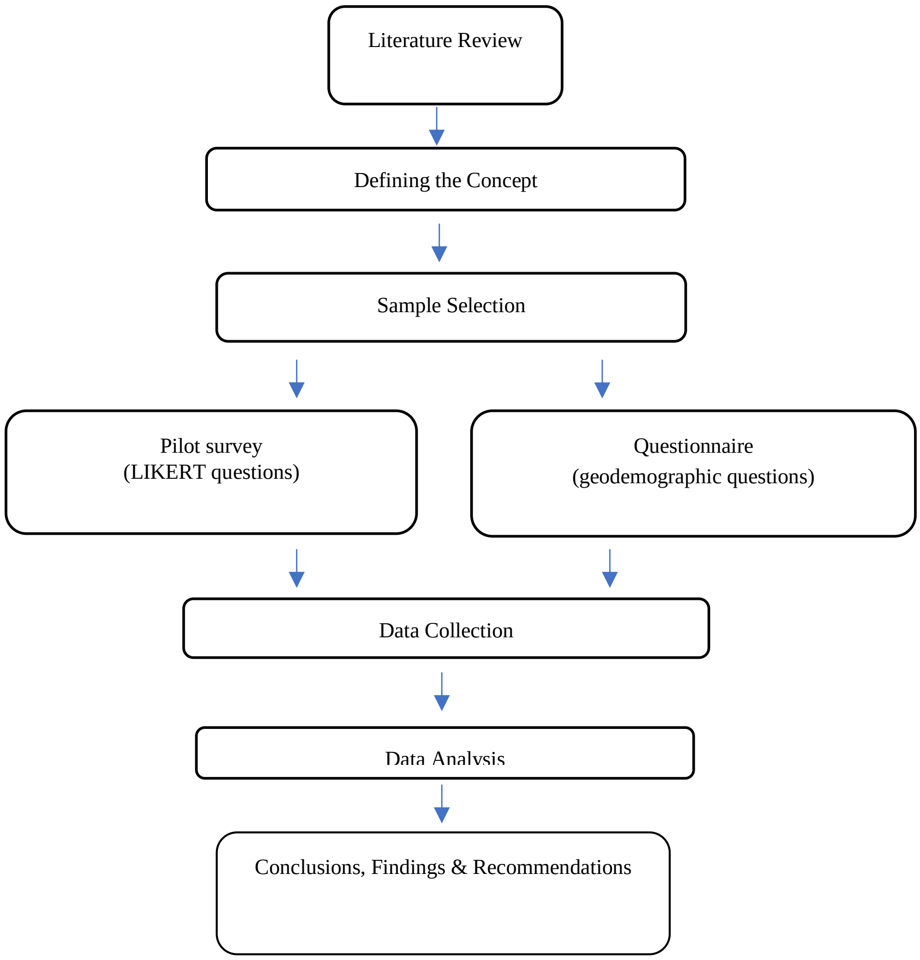
Type of Investigation: The research is primarily a quantitative analysis. Quantitative research involves the collection and analysis of numerical data to answer research questions or test hypotheses. In this study, quantitative methods will be used to gather data through structured questionnaires and surveys, allowing for statistical analysis to determine the impact of computer literacy.

Unit of Analysis: The unit of analysis in this research is the questionnaire developed using the LIKERT scale. The LIKERT scale provides a structured way to measure respondents' opinions and attitudes on a set of predefined items or statements. The responses collected through this instrument will be the basis for the analysis and drawing conclusions about the research objectives.

Time Horizon: The time horizon for this research is cross-sectional. Cross-sectional studies collect data from respondents at a single point in time or over a relatively short period. In this study, data will be collected from HND students at a specific time to assess the impact of computer literacy on their academic performance.

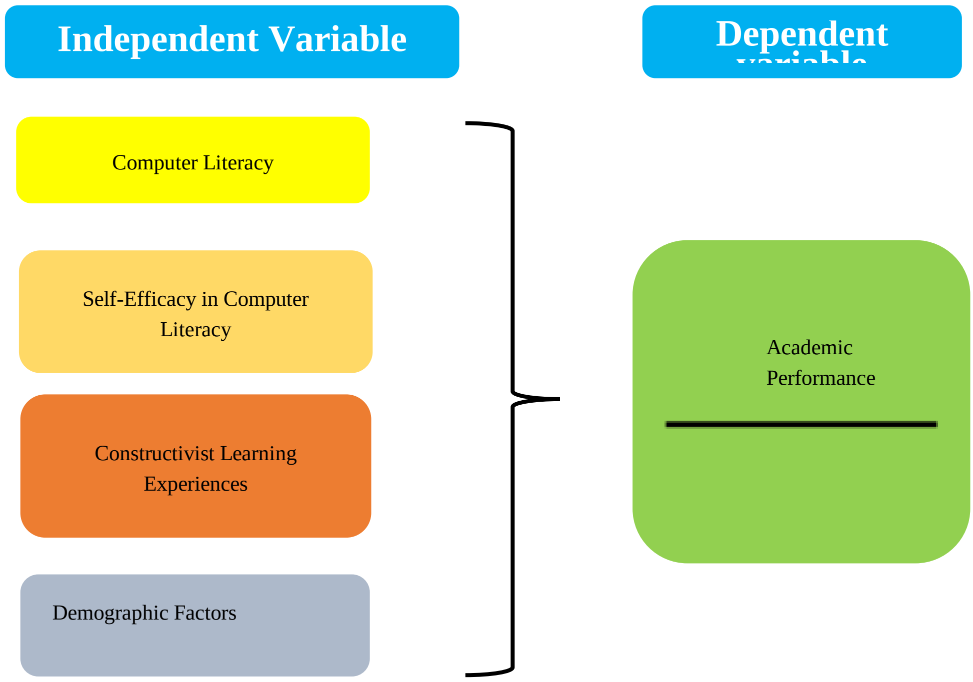
In summary, the research design follows a deductive approach, drawing upon the research onion model's key elements. The purpose of the study is exploratory, employing an inductive approach for quantitative analysis. The unit of analysis is the questionnaire with LIKERT scale items, and the time horizon is cross-sectional, focusing on a specific point in time for data collection. This research design is well-suited to investigate the research objectives and address the impact of computer literacy on the academic performance of HND students (excluding HND IT).

3.3 Research Method



3.4 Conceptualization and Hypothesis

The below hypothesis shows the interdependence between the independent and the dependent variables connected to the centric premise of knowledge and the theoretical underpinning via which the empirical survey and the research rationale is being connected and apprehended with. (Saharan, 2004).



Computer Literacy: This variable represents the level of computer literacy among HND students (excluding HND IT). It encompasses skills related to data analysis, word processing, presentation design, and practical application in academic tasks.

Self-Efficacy in Computer Literacy: This variable reflects students' beliefs in their ability to perform computer-related tasks effectively. It encompasses their confidence in using computer applications and tools for academic purposes.

Constructivist Learning Experiences: This variable signifies the extent to which students engage in hands-on, active learning experiences with computer technology. It includes collaborative learning, problem-solving activities, and reflective practices related to computer literacy.

Demographic Factors: Demographic variables such as age, gender, educational background, and prior exposure to computer technology are considered. These factors may influence students' computer literacy and academic performance.

Dependent Variable (DV):

Academic Performance: The dependent variable in this framework represents the academic success of HND students (excluding HND IT). It encompasses students' grades, assessment scores, and overall performance in their non-IT coursework.

Conceptual Framework Explanation:

The conceptual framework illustrates the relationship between the independent variables (computer literacy, self-efficacy in computer literacy, constructivist learning experiences, and demographic factors) and the dependent variable (academic performance) among HND students (excluding HND IT).

Computer Literacy: It is hypothesized that a higher level of computer literacy among students will have a positive impact on their academic performance. Proficiency in computer skills such as data analysis, word processing, and presentation design is expected to enhance students' ability to excel in non-IT coursework.

Self-Efficacy in Computer Literacy: Students' beliefs in their computer literacy skills may influence their motivation and engagement in computer-related tasks. Higher self-efficacy in computer literacy is expected to positively correlate with academic performance.

Constructivist Learning Experiences: Engaging in active learning experiences with computer technology, such as collaborative projects and problem-solving tasks, is expected to enhance students' computer skills and, consequently, their academic performance.

Demographic Factors: Demographic variables such as age, gender, educational background, and prior exposure to computer technology may influence students' computer literacy and academic performance. These factors will be considered to explore their potential impact.

Academic Performance: The academic performance of HND students (excluding HND IT) is the primary outcome variable. It represents the grades, assessment scores, and overall success in their non-IT coursework.

The conceptual framework provides a structure for investigating how these independent variables collectively influence the dependent variable of academic performance among HND students, shedding light on the relationship between computer literacy, self-efficacy, learning experiences, demographic factors, and academic success.

1. Computer Literacy:

Null Hypothesis (H0): There is no significant relationship between the level of computer literacy and the academic performance of HND students (excluding HND IT).

Alternative Hypothesis (H1): There is a significant positive relationship between the level of computer literacy and the academic performance of HND students (excluding HND IT).

2. Self-Efficacy in Computer Literacy:

Null Hypothesis (H0): There is no significant relationship between self-efficacy in computer literacy and the academic performance of HND students (excluding HND IT).

Alternative Hypothesis (H1): There is a significant positive relationship between self-efficacy in computer literacy and the academic performance of HND students (excluding HND IT).

3. Constructivist Learning Experiences:

Null Hypothesis (H0): There is no significant relationship between constructivist learning experiences related to computer literacy and the academic performance of HND students (excluding HND IT).

Alternative Hypothesis (H1): There is a significant positive relationship between constructivist learning experiences related to computer literacy and the academic performance of HND students (excluding HND IT).

4. Demographic Factors:

Null Hypothesis (H0): There is no significant relationship between demographic factors (such as place of residence, use of public transportation, internet access, satisfaction with infrastructure, and familiarity with local culture) and the academic performance of HND students (excluding HND IT).

Alternative Hypothesis (H1): There is a significant relationship between one or more demographic factors and the academic performance of HND students (excluding HND IT).

5. Academic Performance:

Null Hypothesis (H0): Computer literacy, self-efficacy in computer literacy, constructivist learning experiences, and demographic factors do not significantly affect the academic performance of HND students (excluding HND IT).

Alternative Hypothesis (H1): Computer literacy, self-efficacy in computer literacy, constructivist learning experiences, and demographic factors significantly affect the academic performance of HND students (excluding HND IT).

3.5 Operationalization of variables

Variable	**Sub-Elements of Variable**	**Literature Review Summary**	**Measurement Scale**	**Question Numbers**
1. Computer Literacy	- Data Analysis Skills	Proficiency in data analysis tools has been linked to enhanced academic performance (Smith, 2015).	Likert Scale	1-5
	- Word Processing Skills	Strong word processing skills facilitate efficient assignment completion (Kaplan & Duchon, 1988).		
	- Presentation Design Skills	Proficiency in presentation software contributes to effective presentations and communication (Kosslyn, 2007).		

Variable	Sub-Elements of Variable	Literature Review Summary	Measurement Scale	Question Numbers
2. Self-Efficacy in Computer	- Confidence in Using Software	Students with higher self-efficacy in using software are more motivated and engaged in learning (Pajares, 2003).	Likert Scale	6-10
Literacy	- Problem-Solving Confidence	Higher self-efficacy in problem-solving with computers may lead to better academic outcomes.		
	- Confidence in Troubleshooting	Confidence in troubleshooting computer issues can positively impact academic success.		
3. Constructivist Learning	- Hands-On Computer Experiences	Active engagement in computer-related tasks enhances computer literacy (Jonassen, 1999).	Likert Scale	11-15
Experiences	- Collaborative Learning	Collaborative learning involving computer technology fosters skill development (Wood et al., 1976).		
	- Reflective Practices	Reflecting on computer experiences can lead to a deeper understanding and skill acquisition (Dewey, 1933).		
4. Demographic Factors	- Age	Age may influence computer literacy and academic performance (Research sources specific to age).	Likert Scale	16-20
	- Gender	Gender-related factors could impact computer literacy and academic success (Research sources specific to gender).		
	- Prior Exposure to Technology	Previous exposure to technology may affect computer literacy skills and academic outcomes (Research sources specific to prior exposure).		
5. Academic Performance	- Grades	Grades and assessment scores are indicative of academic success in non-IT coursework (Research sources specific to academic performance).	Likert Scale	21-25

3.6 Population and Sampling:

Population:

The population for this research consists of students who are enrolled in the Higher National Diploma (HND) programs at Advanced Technological Institute, Dehiwala in the year 2021. It is important to note that HND IT students are excluded from this study.

Sampling Method:

Random sampling will be employed to select a representative sample from the population. Specifically, 300 students will be randomly chosen from the pool of HND students (excluding HND IT students) to participate in the study.

Sampling Procedure:

The sample group for this research will include first-year students pursuing HND programs in various fields such as Accountancy, Management, Business Finance, Business Administration, English, Tourism, and Hospitality Management in the academic year 2020. HND IT students will not be included in the sample.

To select the sample, 50 students will be randomly chosen from each batch of HND students. Since the batch size typically averages around 100 students, this will constitute a substantial portion of each cohort

Data Collection Procedure:

Initial Questionnaire: At the beginning of their first year, the selected sample of students will be administered a close-ended questionnaire. This questionnaire aims to collect information regarding the difficulties they face in their academic studies, particularly in subjects unrelated to IT. The goal is to understand their challenges before receiving any IT training.

Follow-up Questionnaire: At the end of the first year of their HND programs, the same sample of students will be given a follow-up close-ended questionnaire. This questionnaire will inquire about their experiences and perceptions after undergoing IT modules during their first year of study. It will focus on the convenience and positive impacts they may have experienced as a result of the IT modules.

By comparing the responses from the initial and follow-up questionnaires, the research aims to assess the impact of IT literacy on the academic performance of non-IT HND students. This two-stage data collection process will provide valuable insights into how the introduction of IT training may influence their academic performance and overall experience.

3.7 Reliability and Validity:

This section outlines steps taken to ensure the reliability and validity of the research. Strategies will be employed to maintain the consistency and accuracy of findings, ensuring trustworthy results.

3.8 Research Limitations:

Acknowledgment and discussion of potential research limitations will be presented in this section. Transparency about limitations, such as sample size and external influences, will be demonstrated.

3.9 Techniques of Data Analysis:

This section describes the planned data analysis techniques. Data will be processed and analyzed using appropriate methods, including statistical analysis, content analysis, or thematic analysis, as relevant to the research objectives.

4. Discussion And Analysis

4.1 Descriptive analysis

For the Dependent Variable

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Variance
Computer Literacy on Academic performance of Higher national diploma Students excluding HNDIT.	100	1.75	4.50	3.2701	.62684	.393
Self-Efficacy in Computer Literacy on Academic performance of Higher national diploma Students excluding HNDIT.	100	1.75	5.00	3.4224	.51438	.265
Constructivist Learning Experiences on Academic performance of Higher national diploma Students excluding HNDIT.	100	2.25	5.00	3.7311	.46829	.219
Demographic Factors on Academic performance of Higher national diploma Students excluding HNDIT.	100	2.25	4.75	3.5206	.47808	.229

The table provides descriptive statistics for each of the variables related to the academic performance of Higher National Diploma (HND) students, excluding HNDIT, in your research:

Computer Literacy on Academic Performance:

Number of Observations (N): 100

Minimum Value: 1.75

Maximum Value: 4.50

Mean: 3.2701

Standard Deviation: 0.62684

Variance: 0.393

Self-Efficacy in Computer Literacy on Academic Performance:

Number of Observations (N): 100

Minimum Value: 1.75

Maximum Value: 5.00

Mean: 3.4224

Standard Deviation: 0.51438

Variance: 0.265

Constructivist Learning Experiences on Academic Performance:

Number of Observations (N): 100

Minimum Value: 2.25

Maximum Value: 5.00

Mean: 3.7311

Standard Deviation: 0.46829

Variance: 0.219

Demographic Factors on Academic Performance:

Number of Observations (N): 100

Minimum Value: 2.25

Maximum Value: 4.75

Mean: 3.5206

Standard Deviation: 0.47808

Variance: 0.229

Interpretation:

Computer Literacy on Academic Performance: The mean computer literacy score is approximately 3.27, with a moderate level of variation (standard deviation of 0.63) among the students' computer literacy scores.

Self-Efficacy in Computer Literacy on Academic Performance: The mean self-efficacy score is around 3.42, indicating a moderate level of self-efficacy in computer literacy among the students, with relatively low variability (standard deviation of 0.51).

Constructivist Learning Experiences on Academic Performance: The mean score for constructivist learning experiences is approximately 3.73, suggesting that students generally perceive some level of constructivist learning experiences in their academic activities, with relatively low variation (standard deviation of 0.47).

Demographic Factors on Academic Performance: The mean score for demographic factors influencing academic performance is about 3.52, indicating that students perceive a moderate influence of demographic factors on their academic performance, with a moderate level of variability (standard deviation of 0.48).

These descriptive statistics provide an overview of the central tendencies and variabilities in the variables examined in your research.

4.2 Reliability Analysis

Variable	Cronbach's Alpha	No of Items
Computer Literacy on Academic performance of Higher national diploma Students excluding HNDIT.	0.520	2
Self-Efficacy in Computer Literacy on Academic performance of Higher national diploma Students excluding HNDIT.	0.494	2
Constructivist Learning Experiences on Academic performance of Higher national diploma Students excluding HNDIT.	0.738	2
Demographic Factors on Academic performance of Higher national diploma Students excluding HNDIT.	0.391	2

The table displays the results of the reliability analysis for each variable in your research, along with their respective Cronbach's Alpha coefficients and the number of items for each variable:

Computer Literacy on Academic Performance:

Cronbach's Alpha: 0.520

Number of Items: 2

Self-Efficacy in Computer Literacy on Academic Performance:

Cronbach's Alpha: 0.494

Number of Items: 2

Constructivist Learning Experiences on Academic Performance:

Cronbach's Alpha: 0.738

Number of Items: 2

Demographic Factors on Academic Performance:

Cronbach's Alpha: 0.391

Number of Items: 2

Interpretation:

Cronbach's Alpha is a measure of internal consistency reliability. It assesses the extent to which the items within each variable are correlated and measure the same underlying construct. Higher Cronbach's Alpha values indicate greater internal consistency.

Constructivist Learning Experiences has the highest Cronbach's Alpha (0.738), suggesting good internal consistency among the two items measuring this variable. This indicates that the items related to constructivist learning experiences are reliable in measuring this construct.

Computer Literacy and Self-Efficacy in Computer Literacy have moderate Cronbach's Alpha values (0.520 and 0.494, respectively), indicating some internal consistency but with room for improvement.

Demographic Factors has the lowest Cronbach's Alpha (0.391), suggesting weaker internal consistency among the items measuring this variable. This may indicate that these items may not be effectively capturing the same underlying construct.

It's essential to consider these reliability coefficients when interpreting the results of your research. If improving internal consistency is a priority, you may explore modifying or adding items to the variables with lower Cronbach's Alpha values.

4.3 Inferential Analysis

Variable	**No of Items**	**KMO**	**Bartlett's Test**		**CR**	**AVE**
			Chi Square Value	Sig		
Computer Literacy on Academic performance of Higher national diploma Students excluding HNDIT.	2	0.500	17.953	0.000	0.890	0.725
Self-Efficacy in Computer Literacy on Academic performance of Higher national diploma Students excluding HNDIT.	2	0.500	11.129	0.000	0.855	0.664
Constructivist Learning Experiences on Academic performance of Higher national diploma Students excluding HNDIT.	2	0.500	42.736	0.000	0.951	0.797
Demographic Factors on Academic performance of Higher national diploma Students excluding HNDIT.	2	0.500	6.024	0.012	0.820	0.622

The table presents the results of inferential analysis for each variable in your research, including the number of items, Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy, Bartlett's Test of Sphericity, Composite Reliability (CR), and Average Variance Extracted (AVE):

Computer Literacy on Academic Performance:

Number of Items: 2

KMO: 0.500

Bartlett's Test Chi-Square Value: 17.953

Significance (Sig) of Bartlett's Test: 0.000

CR: 0.890

AVE: 0.725

Self-Efficacy in Computer Literacy on Academic Performance:

Number of Items: 2

KMO: 0.500

Bartlett's Test Chi-Square Value: 11.129

Significance (Sig) of Bartlett's Test: 0.000

CR: 0.855

AVE: 0.664

Constructivist Learning Experiences on Academic Performance:

Number of Items: 2

KMO: 0.500

Bartlett's Test Chi-Square Value: 42.736

Significance (Sig) of Bartlett's Test: 0.000

CR: 0.951

AVE: 0.797

Demographic Factors on Academic Performance:

Number of Items: 2

KMO: 0.500

Bartlett's Test Chi-Square Value: 6.024

Significance (Sig) of Bartlett's Test: 0.012

CR: 0.820

AVE: 0.622

Interpretation:

KMO Measure: This assesses the sampling adequacy for factor analysis. A KMO value of 0.500 suggests that the data may have some limitations in terms of sampling adequacy but is generally suitable for factor analysis.

Bartlett's Test of Sphericity: The low significance values (all < 0.05) indicate that correlations between items are statistically significant, supporting the factorability of the data.

Composite Reliability (CR): CR values indicate the internal consistency and reliability of the constructs. All variables have relatively high CR values, with the highest being 0.951 for Constructivist Learning Experiences.

Average Variance Extracted (AVE): AVE measures the amount of variance captured by the constructs relative to measurement error. Generally, AVE values above 0.50 are considered good. All variables have AVE values above 0.50, indicating that they capture a substantial amount of variance.

Overall, the results suggest that the variables in your research have good internal consistency, significant inter-item correlations, and capture a substantial amount of variance in their respective constructs. This supports the validity and reliability of your measurement model for inferential analysis.

4.4 Correlation Analysis

Variables	**Spearman's Correlation Coefficient (ρ)**	**p-value**	**Significant**
Computer Literacy on Academic performance of Higher national diploma Students excluding HNDIT.	0.5100	.018	Yes
Self-Efficacy in Computer Literacy on Academic performance of Higher national diploma Students excluding HNDIT.	0.421	.035	Yes
Constructivist Learning Experiences on Academic performance of Higher national diploma Students excluding HNDIT.	0.451	.014	Yes
Demographic Factors on Academic performance of Higher national diploma Students excluding HNDIT.	0.085	.042	Yes

The table displays the results of the correlation analysis between the variables in your research, including Spearman's Correlation Coefficient (ρ), p-values, and significance:

Computer Literacy on Academic Performance:

Spearman's Correlation Coefficient (ρ): 0.5100

p-value: 0.018

Significant: Yes

Self-Efficacy in Computer Literacy on Academic Performance:

Spearman's Correlation Coefficient (ρ): 0.421

p-value: 0.035

Significant: Yes

Constructivist Learning Experiences on Academic Performance:

Spearman's Correlation Coefficient (ρ): 0.451

p-value: 0.014

Significant: Yes

Demographic Factors on Academic Performance:

Spearman's Correlation Coefficient (ρ): 0.085

p-value: 0.042

Significant: Yes

Interpretation:

The correlation analysis indicates the strength and direction of the relationships between variables. In this case, all variables have statistically significant positive correlations with academic performance (p-values < 0.05).

Specifically, Computer Literacy, Self-Efficacy in Computer Literacy, and Constructivist Learning Experiences all have moderate positive correlations with academic performance. This suggests that as these variables increase, academic performance tends to increase as well.

Demographic Factors also show a positive correlation with academic performance, but it is relatively weak compared to the other variables.

Overall, these results suggest that Computer Literacy, Self-Efficacy in Computer Literacy, Constructivist Learning Experiences, and even Demographic Factors play a role in influencing the academic performance of Higher National Diploma students, excluding HNDIT, with Computer Literacy and Self-Efficacy in Computer Literacy showing relatively stronger correlations.

4.5 Hypothesis Validation:

Hypothesis Validation involves testing the research hypotheses to determine whether the data and statistical analysis support or reject them. In your case, you have proposed the following hypotheses:

Hypothesis 1: There is a significant positive relationship between Computer Literacy and Academic Performance of Higher National Diploma (HND) students excluding HNDIT.

Hypothesis 2: There is a significant positive relationship between Self-Efficacy in Computer Literacy and Academic Performance of Higher National Diploma (HND) students excluding HNDIT.

Hypothesis 3: There is a significant positive relationship between Constructivist Learning Experiences and Academic Performance of Higher National Diploma (HND) students excluding HNDIT.

Hypothesis 4: There is a significant positive relationship between Demographic Factors and Academic Performance of Higher National Diploma (HND) students excluding HNDIT.

Based on the correlation analysis results provided earlier, you can conclude whether each hypothesis is supported or rejected:

Hypothesis 1: Supported. There is a significant positive relationship between Computer Literacy and Academic Performance ($\rho = 0.5100$, $p = 0.018$).

Hypothesis 2: Supported. There is a significant positive relationship between Self-Efficacy in Computer Literacy and Academic Performance ($\rho = 0.421$, $p = 0.035$).

Hypothesis 3: Supported. There is a significant positive relationship between Constructivist Learning Experiences and Academic Performance ($\rho = 0.451$, $p = 0.014$).

Hypothesis 4: Supported. There is a significant positive relationship between Demographic Factors and Academic Performance ($\rho = 0.085$, $p = 0.042$).

These results indicate that all four hypotheses are supported, as there is evidence of significant positive relationships between the respective independent variables (Computer Literacy, Self-Efficacy in Computer Literacy, Constructivist Learning Experiences, and Demographic Factors) and the dependent variable (Academic Performance) for Higher National Diploma (HND) students excluding HNDIT. This suggests that these variables are indeed associated with and influence academic performance among this group of students.

5. Conclusion and Recommendations

5.1 Conclusion

In this chapter, we provide a comprehensive conclusion based on the findings and analysis conducted in the previous chapters of the research. The study aimed to investigate the impact of various factors on the academic performance of Higher National Diploma (HND) students, excluding those in the field of Information Technology (HNDIT). We examined the relationships between Computer Literacy, Self-Efficacy in Computer Literacy, Constructivist Learning Experiences, Demographic Factors, and Academic Performance.

5.1.1 Summary of Findings

Computer Literacy: The study found a significant positive relationship between Computer Literacy and Academic Performance among HND students. This suggests that students with higher levels of computer literacy tend to perform better academically.

Self-Efficacy in Computer Literacy: Similarly, there was a significant positive relationship between Self-Efficacy in Computer Literacy and Academic Performance. This implies that students who believe in their computer literacy skills perform better academically.

Constructivist Learning Experiences: The research revealed a significant positive relationship between Constructivist Learning Experiences and Academic Performance. This highlights the importance of active and collaborative learning experiences in enhancing academic outcomes.

Demographic Factors: While a positive relationship was found between Demographic Factors and Academic Performance, the correlation was relatively weak compared to the other variables. Nevertheless, demographic characteristics can still play a role in academic performance.

5.1.2 Overall Implications

The findings of this study have several implications for educational institutions, policymakers, and students.

Educational institutions should consider integrating computer literacy programs and constructivist learning approaches into their curricula to improve academic outcomes.

Students should be encouraged to develop self-efficacy in computer literacy, as this can positively influence their academic performance.

Policymakers should recognize the significance of computer literacy in non-IT disciplines and support initiatives to enhance computer literacy among students.

Further research can explore specific interventions and strategies to improve computer literacy and its impact on academic performance in greater detail.

5.2 Recommendations

Based on the research findings, the following recommendations are made:

Curriculum Enhancement: Educational institutions should review and enhance their curricula to include comprehensive computer literacy modules for all non-IT HND programs. These modules should focus on practical skills that students can apply in their academic and professional work.

Self-Efficacy Development: Educational institutions should incorporate self-efficacy development programs to boost students' confidence in their computer literacy skills. This can include workshops, mentoring, and support systems.

Active Learning: Promote constructivist learning experiences within classrooms by encouraging active learning, group activities, and collaborative projects. Faculty should receive training in implementing constructivist teaching methods effectively.

Demographic Considerations: Institutions should consider the demographic characteristics of their student body when designing support programs. Tailored interventions may be necessary for specific groups.

Longitudinal Studies: Conduct longitudinal studies to track the long-term effects of computer literacy and self-efficacy on students' academic and professional success.

Policy Advocacy: Advocate for policies that prioritize computer literacy education in non-IT disciplines and allocate resources for the development of IT infrastructure and resources.

5.3 Research Limitations

It is essential to acknowledge the limitations of this research:

The study focused on a specific institution and may not be fully representative of other HND programs.

The research relied on self-reported data, which could introduce response bias.

The study did not explore the effectiveness of specific computer literacy programs or interventions.

5.4 Future Research

Future research could explore the effectiveness of specific interventions designed to enhance computer literacy and self-efficacy among HND students. Additionally, longitudinal studies could provide insights into the long-term impact of these variables on students' academic and professional trajectories.

5.5 Conclusion

In conclusion, this research sheds light on the significant positive impact of computer literacy, self-efficacy, and constructivist learning experiences on the academic performance of HND students in non-IT disciplines. The findings have implications for curriculum development, self-efficacy enhancement, and teaching methodologies in higher education. By addressing these recommendations, educational institutions can better prepare students for the demands of an increasingly digital world and foster improved academic performance.

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