



**The attitudes and use of information literacy competencies by
students in a selected programme at a University of Technology in
South Africa**

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Abstract

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<p>The current information age is characterised by an overabundance of information. Information is generated and disseminated at an accelerated pace. Several developments in information and communication technologies have contributed to increased access to information. Adequate information literacy competencies and skills are required to survive and thrive in the information age. Information literacy is a fundamental requirement for success in a higher education environment. The purpose of information literacy, as offered by a University of Technology in South Africa, is to develop first year students' basic level of competence and skills to locate, evaluate and use information in a variety of contexts. Weaknesses and limitations during the development of information literacy modules and a growing concern amongst students about the limited contribution of information literacy towards their academic success have prompted the need to conduct this study. The aim of the study is to explore students' attitudes and perceived use of information literacy competencies and to determine if there is a correlation between students' attitudes and perceived use of the information literacy competencies. The study follows a quantitative, non-experimental approach and is therefore deductive. It is a cross-sectional study. A survey method is applied and a census approach is followed. Data was collected from the target group in the form of an online closed-ended questionnaire that respondents had to complete. A hyperlink to the questionnaire was shared with all potential participants in an email. The questionnaire was structured in the form of statements to which respondents had to choose their level of agreement to the questions using a four-point Likert scale. SPSS was employed to analyse the data. Descriptive statistics, correlational analysis and analysis of variance were used to analyse the data and answer the four research questions. 92 respondents participated in the study. Insufficient responses were received. Responses are thus not representative of the entire cohort of students. The data analysis indicates that, overall, respondents have the knowledge, ability and skills to locate information sources, evaluate located sources to determine their credibility for use and use information in an ethical and legal manner. Overall, the respondents exhibit positive attitudes towards the information literacy competencies to locate, evaluate and use information in an ethical and legal manner. The results also indicate that there is a statistically significant correlation between the respondents' use of information literacy competencies and their attitudes towards information literacy. The differences between the respondents' use of information literacy competencies and their attitudes towards information literacy, based on their demographic groupings, are statistically insignificant except in one instance. Based on the findings, recommendations include: the need track students' use of information literacy competencies and attitudes towards information literacy throughout their academic career, the need to implement an independent tool to assess students' use of information literacy competencies and the need to revise the pedagogical methodologies, -processes and -practices that underpin the information literacy module. Recommendations for future research were also identified.</p>
Keywords Information literacy, information literacy competencies, attitudes towards information literacy, use of information literacy competencies.

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1 Introduction

1.1 Background and rationale

1.1.1 Information age

We currently live in an era called the information age that is characterised by an overabundance of information. Information is generated and disseminated at an exponential rate. In fact, “information is the fastest growing thing on the planet” (Kelly, 2006). The total amount of data created, captured, copied and consumed was estimated to have reached 64.2 zettabytes in 2020 (Taylor, 2023). By 2025 global data creation is projected to grow to more than 181 zettabytes (Taylor, 2023). No less than 402 million terabytes of data are created daily (Duarte, 2024). There are approximately 22 billion searches performed on Google per day - more than 255,000 searches every second (Cardillo, 2024). There are more than 1.98 billion websites online (Minaev, 2024). Petrosyan (2024) estimates that the number of internet users worldwide in 2024 is 5.44 billion people, which is roughly two thirds of the global population. Several developments in information and communication technologies, such as increased internet connectivity, improved search capabilities and advances in mobile devices contribute to an increase in access to information.

1.1.2 Infobesity

Unfortunately, infobesity or infoxication has become a major problem in the current information age. Infobesity refers to a state of being overloaded with information. According to Awuor, Kwanya and Nyambok (2019) infobesity manifests itself in multiple ways and is caused by the rapid rate of information being generated, contradictions and inaccuracies in available information and a lack in methodology to compare and process different information. Kurelović, Tomljanović and Davidović (2016) argue that, amidst the current proliferation of information accessible on the internet, it is becoming increasingly harder to effectively organise and find quality information, despite the availability of tools, such as web search engines and indexing tools. McGrew, Breakstone, Ortega, Smith and Wineburg (2018) remark that the internet puts enormous responsibility on individuals to evaluate the reliability of information, because they can fall victim to false claims and misleading arguments. Closely connected to the need to subject information on the internet to rigorous scrutiny in order to determine its credibility, is the importance to use the information created by other people with integrity in line with ethical and legal considerations. Individuals that live in the current information age must therefore exhibit a basic information literacy proficiency in order to survive and thrive.

1.1.3 Digital natives

There is a general perception that digital natives, with their computing and internet skills are information literate (Mahmood, 2016; Šorgo, Bartol, Dolničar and Podgornik, 2017). However, the research study of Šorgo, Bartol, Dolničar and Podgornik (2017) has indicated that such a perception is misleading. Digital natives are not necessarily information literate. This is also echoed in the study of Mahmood (2016).

1.1.4 Digital divide

South Africa is facing many challenges due to historical inequalities and exclusion of certain population groups. The so-called digital divide, a global phenomenon, is a prominent challenge affecting South Africa's citizens and specifically higher education students on a daily basis. According to Hanna the digital divide refers to "the gap between demographics and regions that have access to modern information and communication technology and those that don't or have restricted access" (2021). Innovation Edge (2022) argues that the digital divide is not only about access to technology - it also involves literacy in technology. The educational environment plays a fundamental role in addressing literacy in technology. Information literacy, a fundamental learning module at the University of Technology where this research study was undertaken, addresses specific aspects of literacy in technology by harnessing and capitalising on the availability of information in electronic format.

1.1.5 Changes to information literacy training at a University of Technology

In 2014 the senate of a University of Technology in South Africa took a decision whereby information literacy was to become a credit bearing module in all new and re-curriculated undergraduate programmes offered by the university. Between 2014 and 2017 three information literacy modules were developed weighing one, two and three credits. Information literacy was first introduced in the university in 2018. Information literacy as a credit bearing module, that is part of a specific healthcare related programme, was introduced in 2020. Currently, information literacy constitutes one of four fundamental learning modules that all students, who enrol in a new or re-curriculated undergraduate programme, must complete in order to graduate.

The University of Technology holds the view that information literacy is a fundamental requirement for success in an academic environment. For this reason, information literacy is offered to

students during their first year of study in the hope that the information literacy competencies contribute positively to students' academic development and -success.

1.1.6 Concerns of students

Unfortunately, there is a growing concern amongst students, which include some students who enrolled in a selected healthcare programme, that the information literacy module does not contribute positively to their academic development and -success. Students who hold this view have expressed their concerns to their information literacy lecturers. Some concerns were also raised at specific institutional forums during which students are encouraged to raise academic related matters. Due to the growing concerns raised by students, there is a need to assess students' attitudes towards information literacy and their perceived use of information literacy competencies.

1.1.7 Inefficient processes and practices

The department that was mandated to develop and implement the information literacy subjects operated largely in a silo during the conceptualisation and curriculum development phases that were undertaken between 2014 and 2017. Collaboration between the department and the division that is responsible to provide curriculum development support was only sporadic. This resulted in limited alignment between the curriculum and the teaching and learning strategy that underpin the information literacy modules. A careful consideration of pedagogical approaches was absent during the developmental phases of the modules. One of the three information literacy modules was piloted on a small scale before its introduction within the institution. However, the pilot only focused on obtaining feedback from information literacy lecturers regarding their experiences in presenting the module content. Since the implementation of the modules institutionally, students have not been offered the opportunity to formally share their experiences of the information literacy modules. Such an undertaking is necessary for the continuous improvement of the modules. Weakness and limitations during the developmental phases of the information literacy modules, including the lack of opportunities for students to share their experiences, contribute to the need for this research study.

1.2 Aims and objectives

This research study aims to explore the perceived use of information literacy competencies and the attitudes towards information literacy of students who are enrolled in a specific healthcare related programme of a University of Technology in South Africa. The study also aims to explore the possible correlations between the students' perceived use of information literacy competencies and their attitudes towards information literacy.

Research studies of this nature are often of significant importance to different stakeholders. This research study contributes towards the continuous improvement of the credit bearing information literacy modules at the University of Technology in South Africa that is the focus of the study. By applying appropriate pedagogical theories, -approaches and -practices the self-efficacy of students' information literacy competencies can be increased which have a positive impact on students' academic success. It is anticipated that the research study will also positively contribute to the body of knowledge about information literacy practices that are undertaken by universities in South-Africa including the impact of information literacy competencies on student success.

In support of the aims of the research study, the following research objectives have been identified:

- O1 to determine the perceived use of information literacy competencies by students who are enrolled in a specific healthcare related programme at a University of Technology in South Africa,
- O2 to assess the attitudes of students who are enrolled in a specific healthcare related programme towards information literacy,
- O3 to determine if there is a correlation between the attitudes towards and use of information literacy competencies by students who are enrolled in a specific healthcare related programme at a University of Technology in South Africa and
- O4 to establish if there are significant differences between the different demographic groupings of students who are enrolled in a specific healthcare related programme at a University of Technology in South Africa.

1.3 Research questions

Based on the objectives listed above, the study focuses on the following four research questions:

- Q1 What is the perceived use of information literacy competencies by students who are enrolled in a specific healthcare related programme at a University of Technology in South Africa?
- Q2 What are the attitudes towards information literacy of students who are enrolled in a specific healthcare related programme at a University of Technology in South Africa?
- Q3 Is there a correlation between the attitudes towards information literacy and the perceived use of information literacy competencies by students who are enrolled in a specific healthcare related programme at a University of Technology in South Africa?
- Q4 Are there any significant differences between the attitudes towards information literacy and the use of information literacy competencies by students in a specific healthcare related programme at a University of Technology in South Africa based on the different demographic groupings of the students?

1.4 Limitation

The target group of this research study was limited to students who are enrolled in a selected healthcare related programme of a University of Technology in South Africa. The results of this research study cannot be generalised and applied to students who are enrolled in other programmes at the same University of Technology in South Africa. Nor can the results of the study be generalised and applied to students who are enrolled in similar healthcare related programmes at other Universities of Technology in South Africa.

2 Literature review

2.1 Introduction

In this research study a simple literature review process is adopted. According to Machi and McEvoy a simple literature review “...documents, analyzes and draws conclusions about what is known about a particular topic. Its purpose is to produce a position on the state of that knowledge” (2016). Leedy and Ormrod emphasise that: “the more you know about investigations and perspectives related to your topic, the more effectively you can address your own research problem” (2013). Kothari and Garg (2019) state that conceptual literature that focuses on concepts and theories and empirical literature that focuses on previous studies that are similar to the one proposed, should be examined during a literature review. The statements above form the foundational framework of the content included in this chapter.

2.2 Literacy

According to Williams (1983) the term literacy was first used towards the end of the nineteenth century. The term only became popular in educational discourse during the 1970s (Lankshear and Knobel, 2003). Hillerich defines literacy as “that demonstrated competence in communication skills which enables the individual to function, appropriate to his age, independently in his society and with a potential for movement in that society” (1976). Already in 1976 Hillerich pleaded that there is a need to clarify the meaning of literacy. This need has been intensified by the emergence of multiple types of literacies during the past few decades.

Today, the word literacy is commonly defined as the ability to read and write (Purdy, 2022). Unfortunately, such a basic definition does not consider the challenges faced by educators, researchers, scientists and linguists alike to provide a contextualised definition of this elusive and evolving concept. The existence of many diverse, often conflicting, definitions for the concept confirms the notion that there is no universal or generally accepted definition.

Lloyd (2010) argues that there are many different definitions for the concept of literacy that emanate from different theoretical perspectives. According to Lloyd (2010), when a cognitive approach is adopted, literacy is seen as a capability that enables an individual to acquire knowledge and skills; when a technician approach is adopted, literacy is understood to be a tool for performance - a generic skills or competency that is transferrable to different contexts; when a social practice approach is adopted, literacy is defined as practices that are learnt and used in

specific cultural contexts. Lupton (2008) emphasises that literacy can be approached from three perspectives: 1) as a set of generic skills, 2) situated in social practices and 3) transformative.

The term multiliteracies was first coined by a congregation of literacy specialists called the New London Group during the middle of the last century (Navehebrahim, 2011). Westby (2010) argues that, in the current modern era that is characterised by technologically advanced and culturally diverse societies, literacy extends beyond the functional skills of reading and writing to include multiple literacies that involve different ways of thinking and reasoning in all areas of life and literacy is therefore applied to a diverse range of modalities. Literacy scholars generally agree on the existence of multiple types of literacies. The proliferation of literacies gained momentum due to technological advances of which the emergence of the internet constitutes a major driving force towards multiliteracies. An investigation by Stordy (2015) into the different types of literacies that were the topic of discourse in academic literature, refers to at least 37 types of literacies of which information literacy and digital literacy were cited most frequently. According to Tyner (1998) literacies can be grouped in three broad categories: 1) text-based or alphabetical literacy, 2) representational literacy and 3) tool literacy. Rafferty (1999) identified 38 types of literacies that are grouped in the three broad categories of Tyner. More recently Kapur (2019) distinguishes between computer, vernacular, digital, visual, school, media, health, emotional, cultural and moral literacies. A brief internet search on the types of literacies confirms that many scholars have attempted to describe the nature and scope of multiliteracies, each with a unique focus and emphasis. Unfortunately, there is currently no consensus on a taxonomy of the different types of literacies and it is becoming increasingly more difficult to assimilate the divergent views of scholars.

2.3 Information literacy

This research study focuses only on one particular type of literacy namely information literacy. Proponents of information literacy and many literacy scholars such as Ranaweera (2008), Breivik (2014), Johnson (2017) and Thompson (2013) acknowledge that information literacy is a distinct type of literacy.

Information literacy has been a topic of discussion for nearly half a century. It is generally accepted that the term can be traced back to PG Zurkowski who used the term in 1974 in a paper presented to the United States National Commission on Libraries and Information Science (Masi, 2019). Johnston and Webber (2003) state that there has been an increased interest in information literacy since Zurkowski coined the term. Currently the concept of information literacy is the subject of some ambiguity. According to Virkus (2009) some professionals say that information

literacy is just a natural progression in evolution of the field, while others hold the view that information literacy is just a new name for what has always been done. There are also proponents who believe that information literacy is a new concept that represents a new way of thinking about the library profession.

The concept of information literacy as we know it today developed in a specific context and is thus not devoid of historical influences. It should also be acknowledged that the concept of information literacy is something new when compared to its precursors. Rockman (2004) holds the view that information literacy has gained legitimacy as the term to use instead of library instruction and user education (cited by Virkus, 2009). While the term information literacy is widely used, a generally accepted and inclusive definition remains elusive. Limberg, Sundin and Talja (2012) hold the view that the meaning of the term information literacy varies according to the theoretical lens from which it is approached.

Several studies have been conducted on the development of information literacy as a separate field of study. See Johnston & Webber (2003), Leaning (2017), Sample (2020), Li, Chen & Wang (2021), Addison and Meyers (2013) and Anunobi and Udem (2014), to mention just a few. Yet scholars such as Lloyd (2010), Secker and Coonan (2011), van der Meijden and van der Meijden (2014) Bawden (2017) argue that information literacy is merely sub-field of digital literacy.

Organisations such as the American Library Association, the Association for College and Research Libraries, which is a division of the American Library Association, the Society of College, National and University Libraries in the United Kingdom and Ireland and the Australian and New Zealand Institute of Information Literacy have played a monumental role in the development of information literacy during the last three decades. The standards and guidelines developed by these institutions form the foundation of formal and informal information literacy training across the globe - South Africa included. In South Africa, the Committee of Higher Education Libraries in South Africa has developed a national framework for information literacy training. Esterhuizen and Kuhn (2010) argue that, due to the initiative of the Committee of Higher Education Libraries in South Africa, the movement towards a common core curriculum for information literacy at university level has gained momentum.

According to Durodolu and Mojapelo (2020) the core of information literacy education in South Africa is embedded in Section 32 of the Constitution of South Africa, which focuses on access to information. It is no surprise that information literacy development in South Africa is entrenched in the post-apartheid transformation agenda of the education sector. De Jager and Nassimbeni (2002) emphasise that the framework for information literacy in higher education institutions is

informed by education policies, information and communication technology policies and library and information services policies.

With reference to the status of information literacy in the educational domain, de Jager and Nassimbeni state that: "...by the time students reach higher education institutions, the vast majority have had little or no exposure to library and information resources and do not possess the skills to use them" (2002). They conclude that the need for information literacy is big, because of the limited exposure at secondary level. More than two decades after this article was authored little progress has been made to enhance the information literacy skills of learners. Higher education institutions are thus forced to bridge the gap by teaching information literacy competencies to improve students' success at tertiary level.

Moll holds a different view than de Jager and Nassimbeni. Moll (2009) argues that the incorporation of information literacy skills in the curriculum appeared in 1994. Through an analysis of curriculum documents, Moll (2009) concludes that the information literacy in the higher education sector in South Africa is not something separate from what is taught in the secondary education sector.

The role and use of information literacy in a higher education context has been widely covered in literature during the last decade. Patil (2019) examined the need and importance of information literacy in higher education. Yevelson-Shorsher and Bronstein (2018) compared the perspectives of students, academics and librarians towards information literacy. Bashorun, Bashorun, Olarongbe and Akinbowale (2022) reflected on information literacy competence and use of electronic resources by undergraduate students at the University of Ilorin, Nigeria. El Hassani (2015) explored the role of information literacy in higher education from the perspective of the Al Akhawayn University in Morocco.

Literature that has seen the light during the last decade on the role and use of information literacy in the higher education context in South Africa is more limited. Moyo and Okemwa (2022) reflected on students' perceptions of information literacy at two South African universities that are located in the Eastern Cape province. Moyo and Mavodza (2015) provided an overview and comparison of the provision of information literacy skills to university students in South Africa and the United Arab Emirates. Although the purpose of the study was to compare the information literacy practices at tertiary education level in South Africa and the United Arab Emirates, the study elaborated on the current perspectives, up to 2015, on the state of information literacy in South Africa.

In 2019 the Committee of Higher Education Libraries of South Africa adopted an academic library standards framework. One of the standards outlined in the framework relates to the educational

role of academic libraries and, specifically, the extent to which library staff partners with academic departments on the integration of information literacy into the curriculum. This development paves the way for the further development of information literacy in the higher education sector in South Africa.

2.4 Information literacy competencies

The meaning of the word competence is ambivalent. Schneider (2019) conducted a systematic review of the concept. According to the analysis conducted by Schneider (2019) competence can be seen as an ability, a disposition, a process, a relation, a quality or state of being and a combination of resources.

Anunobi and Udem see information literacy competence as: “possession of the necessary knowledge, skills and attitudes to recognize the need for information; recognize that accurate and complete information is the basis for intelligent decision making; identify potential sources of information; develop successful search strategies; access sources of information, including computer computer-based and other technologies; evaluate information; organise information for practical application; integrate new information into an existing body of knowledge; use information in critical thinking and problem solving; understanding many of the legal, economic and social issues surrounding the use of information and accesses and uses information ethically and legally” (2014). Anunobi and Udem (2014) mention that information scientists use different theoretical models to explain the competencies expected from an information literate person, yet there is general consensus amongst them that information literacy competencies are a combination of knowledge, skills and attitudes.

According to the Association of College and Research Libraries a person is considered to be information literate when a person is able to: 1) determine the extent of information needed, 2) access the needed information effectively and efficiently, 3) evaluate information and its sources critically, 4) incorporate selected information in one’s knowledge base, 5) use information effectively to accomplish a specific purpose and 6) understand the economic, legal and social issues surrounding the use of information and access and use information ethically and legally (2000). The Society of College, National and University Libraries (SCONUL) in the United Kingdom and Ireland has a more inclusive view of information literacy which includes elements of digital-, visual-, media- and academic literacies. According to SCONUL an information literate person: 1) is able to identify a personal need for information, 2) can access current knowledge and identify gaps, 3) can construct strategies for locating information and data, 4) can locate and access the information and data needed, 5) can review the research process and compare and

evaluate information and data, 6) can organise information professionally and ethically and 7) can apply the knowledge gained, present research results, synthesise new and old information and data to create new knowledge and disseminate it in a variety of ways (Bent, Stubbings, and SCONUL, 2011).

The author of this research study holds the view that the possession of information literacy competencies is dynamic and contextual. The development of information literacy competencies is a continuous life-long process. In the ever-changing information- and information technology landscapes, information literacy competencies must be adjusted continuously to remain relevant. It is thus frivolous to provide a list of statistic criteria that must be met before a person is regarded as being information literate.

There are numerous examples in the literature of studies that have been conducted to assess the information literacy competencies of students in a higher education context. See the studies of Kavi, Anafo, Bugyei and Ofori (2019), Adekunle and Madukoma (2022), Friday and Joshua (2019) and Chanchinmawia and Verma (2017) as recent examples. Information literacy competencies of students in health sciences have also been widely documented. Young and Hinton (2019) authored a book that focuses on information literacy for health sciences with the information literacy framework of the Association of College and Research Libraries as the basis for information literacy instruction. Ennaceur, Bugis and Al-Mohaithef (2023) measured the information literacy competencies of health science students using the Research Readiness Self-Assessment tool. It is the assertion of this study that the focus of assessment is generally similar in nature and involves students' use of information literacy competencies. However, the assessment instruments and -methodologies vary and are aligned with pedagogical paradigms, content and outcomes that underpin the information literacy instructional activities.

2.5 Attitudes towards information literacy

There are several educational theories that correlate attitudes and learning. According to Bloom and Krathwohl (1956) there are three domains within education: cognitive, affective and psychomotor. The affective domain theory focuses, amongst others, on the importance and impact of attitudes in education and learning. Swain (2013) emphasises that learning is a cognitive and emotive process as the two are interconnected. Pekrun, Elliot and Maier (2009) point out that emotions and attitudes can influence cognitive processes, such as memory and information processing. Positive attitudes can enhance learning while negative attitudes can decrease learning. Schunk and Zimmerman (2007) postulate that cognitive processes can also influence affective factors. According to Zins, Weissberg, Wang and Walberg (2004), students who engage

in activities that require cognitive and affective processes can develop a deeper understanding of content, enhance their emotional intelligence and stimulate a positive attitude towards learning. Marton and Saljo (1997) emphasise that positive attitudes towards learning stimulate a stronger desire to participate in the learning process.

The social cognitive theory of Albert Bandura, especially his self-efficacy theory is another important theoretical perspective that underpins this research study. According to LaMorte (2022) the social cognitive theory originated in the 1980s. It is rooted in the social learning theory of Albert Bandura that started in the 1960s. The social cognitive theory accentuates that learning occurs in a social context. Individuals influence their environment, but is also influenced by it (Nickerson, 2023). Of interest is Bandura's self-efficacy theory that focuses on the belief that a person has the capacity to achieve a specific goal or perform a specific action. Cognitive self-evaluations influence the likelihood of attaining the desired level of performance (Carey and Forsyth, 2009). Several studies illustrate that there is a high correlation between self-efficacy and learning (Honicke and Broadbent, 2016; Richardson, Abraham and Bond, 2012). A study of Wu and Tsai (2006) reveal that students' attitudes are a key indicator for self-efficacy.

The attitudes of students towards information literacy were the focus of research during the last decade. Diseiye (2018) studied the self-efficacy and attitudes of library and information science students towards information literacy skills. The assertion of Diseiye is that students' information literacy skills are influenced by their attitude. Diseiye concludes that an increase of students' self-efficacy may lead to a corresponding increase in their information literacy skills. According to a study reported by Adekunle, Olla, et al. (2019) students' attitudes to, and perception of, information literacy significantly influence their information literacy skills. Similar conclusions have been reached in other studies. A study conducted by Osman (2017) established that students' attitudes was one of multiple factors that had an impact on the acquisition of information literacy skills by the students.

2.6 Information literacy and connectivism

Information literacy, as a field of study, is deeply rooted in the Connectivism Learning Theory. It is generally accepted that Georg Siemens first advanced this theory during the beginning of the twenty first century. According to Siemens (2005) the traditional learning theories (i.e. behaviourism, cognitivism and constructivism) were developed at a time when technology had a relatively low impact on learning. Bell (2010) emphasises that connectivism is a successor of the well-established traditional learning theories. Siemens (2005) holds the view that, in the age we live in, we derive competence by forming connections. He states that: "the capacity to form

connections between sources of information, and thereby create useful information patterns, is required to learning in our knowledge economy. Learning is a process of connecting specialized nodes of information sources” (2005).

Guder postulates that: “concepts like critical thinking, credibility, relevance, validity, information seeking, and access to information, all concepts that are important to the missions of libraries, are all prevalent in the principles of Connectivism” (2010). Transue (2013) argues that a basic information literacy proficiency, namely: to search, locate, access, evaluate and use information from multiple sources, involves creating connections between many types of resources in a rapidly evolving environment. Transue (2013) subsequently relates the core principles of connectivism as advocated by Siemens, to the information literacy standards of the Association of College and Research Libraries (2000). A study of McBride (2011) found that Connectivism Learning Theory is incorporated in information literacy instruction. Dunaway states that: “the similarities between the principles of the connectivist perspective of learning and emerging conceptualizations of information literacy suggest that connectivism provides a useful framework for understanding learning in the context of information literacy education” (2011). It can be argued that connectivism essentially describes the ways in which students acquire information literacy skills (Dunaway, 2011).

2.7 Information literacy at a University of Technology in South Africa

Information literacy at the University of Technology in South Africa that is the focus of this research study has a long history that predates the existence of the institution. The University of Technology was established on 1 January 2004. It is the result of a merger of three Technikons in South Africa. The merger of the three Technikons was part of a government initiative to transform the educational sphere of post-apartheid South Africa. At the time of the merger all three Technikons had library instruction and/or -training programmes in place - albeit that the nature and scope of learning outcomes and training interventions of the mentioned library instructional and - training programmes were diverse. During the early years after the establishment of the University of Technology, the Department of Library and Information Services initiated the design and development of an information literacy training programme. An Information literacy policy was also adopted in 2005 (Molepo, 2018) that provided the framework for information literacy training at the institution. The information literacy training programme aimed to ensure equitable and uniform information literacy practices on all campuses of the university. The information literacy programme consisted of seven interventions ranging from library orientation for first year students to databases training for postgraduate students. It also included training on EndNote, a reference

management tool. Attendance of the programme was voluntary. In 2014 the information literacy endeavours were steered in a new direction when the university's senate approved the inclusion of a credit bearing information literacy module in new and re-curriculated programmes. The credit bearing information literacy module was first introduced in 2018. In the same year the information literacy module was designated as one of four fundamental learning modules that all first-year students had to complete in order to graduate. Currently the University of Technology offers three information literacy modules ranging between one and three credits. The learning outcomes of the information literacy modules overlap partially. In 2023 15,112 students registered for an information literacy module. It should also be noted that the Department of Library and Information Services continues to offer non-credit bearing training interventions on a wide range of topics.

During the curriculum development phase of the information literacy modules that were undertaken between 2014 and 2016 an information literacy task team from the Department of Library and Information Services compiled a conceptual framework for information literacy as a credit bearing module. The conceptualisation included an analysis of the information literacy frameworks of the American Library Association, the Association for College and Research Libraries, which is a division of the American Library Association, the Society of College, National and University Libraries in the United Kingdom and Ireland and the Australian and New Zealand Institute of Information Literacy. The common elements and unique features of the frameworks were compared.

Due to the limited credit allocation of the information literacy modules, the following definition of information literacy was adopted: "Information literacy is a set of skills that enable you to find, evaluate and use information in an ethical and a legal manner." The definition of information literacy that was adopted, constitutes the outline of the information literacy modules. It is evident from the adopted definition that information literacy follows a competency-based approach. The main purpose of the module is to develop students' basic information literacy proficiency, which is 1) to locate information sources, 2) evaluate the located sources to determine their credibility for use and 3) use information in an ethical and legal manner, so that students can achieve academic success during their first year of study. As part of the process of module development, a teaching and learning strategy was also compiled and adopted. Highlights of the teaching and learning strategy is listed below:

- The information literacy module consists of a theoretical component and a practical component during which basic theoretical elements are applied in practice in the context of the University of Technology.
- Approximately 50% of the learning outcomes of the information literacy module is achieved by the attendance of lectures that is presented by assistant librarians. The other 50% of the learning outcomes are achieved by the completion of self-study learning activities

including corresponding quizzes that are accessible via the learning management of the University of Technology.

- Module content that forms part of the theoretical component is disseminated during lectures. A copy of the content is made available to students via the learning management system of the institution. Content that forms part of the practical component is disseminated via the learning management system.
- Learning outcomes that form part of the practical component is presented in the form of diverse self-study learning activities and quizzes that students must complete within specific timeframes.
- Content that forms part of the self-study learning activities are completed sequentially due to the logic progression of the associated learning outcomes.

The assessment strategy of the information literacy module includes the following aspects:

- Multiple assessment activities consist of practical exercises (formative) in class, the completion of quizzes (summative) that form part of the self-study learning activities and the completion of a test (summative) at the end of the academic year.
- A continuous assessment strategy is followed - students do not complete an examination.
- The test is completed online via the learning management system of the institution.
- The integrity of the online test is ensured by the random selection of questions from a question bank, the random ordering of questions that are included in the online test and the random ordering of answers of each question included in the test.
- The marking of the test is automated - feedback is immediate.
- In line with the continuous assessment strategy, students have three attempts to complete the online test. The highest mark obtained from the three allocated attempts is used in the calculation of the final mark.
- 50% of the final mark comprises of the test score. The other 50% comprises of the combined score of the quizzes that form part of the self-study learning activities.
- A sub-minimum of 25% for the test and 25% for the combined score of the quizzes are required to pass the module.
- A final mark of 50% is required to pass the module.

The author of this research study holds the view that students' use of information literacy competencies and their attitude towards information literacy are not only based on the learning outcomes of the information module and the corresponding module content, but also on the adopted teaching and learning strategy and the assessment strategy - thus the total learning experience. Students' use of information literacy competencies and their attitudes towards information literacy should thus be viewed holistically.

2.8 Chapter conclusion

The purpose of this chapter was to provide a summarised literature review related to the focus of this research study. Information literacy has a long history of development. Developments in information and communication technologies continue to shape information literacy. Amidst growing research, information literacy remains ambiguous. There are different pedagogical models and -approaches to information literacy. The Connectivism Learning Theory is at the root of the conceptual framework of this research study. Information literacy is important in higher education. It is fundamental for the academic success of students - especially first-year students.

Previous studies indicate there is a correlation between students' use of information literacy skills and their attitudes towards information literacy. Information literacy at the University of Technology that is the focus of this research study follows a competency-based approach. Students' use of information literacy competencies and their attitude towards information literacy should be understood in the specific context in which it is taught at the University of Technology. It is not only the learning outcomes and content of the information literacy module that has an impact on students' use of information literacy competencies, including their attitudes towards information literacy. The adopted teaching and learning- and assessment strategies that underpin the information literacy instructional processes and practices are fundamental. The next chapter focuses on the research methodology adopted in this study.

3 Methodology

This chapter explains the research methodology that is followed in this study. The adopted methodology is aligned with the research objectives and provides the framework to answer the research questions. This chapter specifically focuses on the research design, the data collection processes, the population and ethical considerations.

3.1 Research approach and design

“Research design is the glue that holds a research study together” (Trochim and Donnelly, 2007). Leedy and Ormrod define research as: “a systematic process of collecting, analyzing and interpreting information in order to increase our understanding of a phenomenon about which we are interested or concerned” (2013). Kothari and Garg (2019) emphasise that the purpose of research is to discover answers to questions through the application of scientific procedures. The very nature of research and scientific enquiry require that a structured, properly designed and systematic process is adopted and followed.

Kothari and Garg (2019) mention that it is imperative that an efficient and appropriate design must be prepared before research operations commence, because the design assists the researcher to organise his ideas in order to look for potential flaws. Somasundaram (2022) states that research design is a systematic procedure to carry out the different tasks of the research study. It constitutes a framework that ensures that the research proceeds in the right direction without deviation from the research tasks. According to McCombes (2021) research design involves decision making on the research objectives, the type of research, data collection methods and - procedures, sampling methods and criteria for selecting subjects and data collection methods. The research design in this study was meticulously considered to ensure that the research objectives are met and the research questions are adequately answered.

Research can be classified in three broad categories namely: quantitative, qualitative and mixed methods (Creswell, 2014). Davies (2007) argues that when research is conducted on people’s opinions, feelings, experiences or behaviour, a qualitative or quantitative approach can be followed. According to Kothari and Garg (2019) a qualitative research approach is relevant when human behaviour, including attitudes and opinions, are investigated. In practice there are numerous examples of research that have been conducted that focuses on human behaviour following a quantitative approach. This study followed a quantitative approach. A quantitative approach was specifically chosen due to the aims of this study and the objectives, the formulated research questions and the nature of the topic. Personal preference also played a role.

Creswell (2014) states that quantitative research is rooted in the postpositivist worldview and that the knowledge that develops through a postpositivist paradigm is based on careful observation and measurement of the objective reality. He adds that developing numeric measures of observations and studying the behaviour of individuals is paramount for postpositivists.

Quantitative research can be classified as either experimental or non-experimental research (Mohajan, 2020). Non-experimental research is often divided into the descriptive, causal, comparative, evaluation, existing data and meta-analysis approaches according to Mohajan (2020). In citing Walker (2005) and Aggarwal (2008), Mohajan (2020) argues that descriptive research is used when little is known about a phenomenon. It is widely used in education and behavioural sciences. This study followed a non-experimental approach. It was descriptive and causal in nature in line with the research objectives.

The research study is a cross-sectional study that collected data from students in a selected programme at a specific time. Thomas (2023) mentions that in cross-sectional research you can observe variables without influencing them and is best suited if you want to examine the prevalence of some outcome at a certain point in time. The very nature of a cross-sectional study contributed to the validity and reliability of data in this study. Another reason why a cross-sectional study was the preferred choice was because cross-sectional studies allow you to collect data from a large pool of subjects and compare differences between groups (Thomas, 2023).

3.2 Data collection method

The study adopted a survey approach to collect data from students. Creswell (2014) mentions that surveys, which are part of non-experimental research designs, provide a numerical description of trends, attitudes or opinions of a population and includes cross-sectional and longitudinal studies using questionnaires. The survey approach provides a numerical description of students' perceived use of information literacy competencies and their attitudes towards information literacy. The decision to adopt a survey approach in this study is based on multiple factors such as: the size of the population, the specific focus of the research study as outlined by the research objectives, the nature and scope of questions that were included in the survey, the ease of administering the survey and the cost effectiveness when compared to other methods.

Survey research is an excellent method to collect original data from a population that is too large to observe directly (Babbie and Mouton, 2001). Surveys are also excellent vehicles for measuring attitudes and orientations in a large population (Babbie and Mouton, 2001). Gillham (2008)

highlights that 1) survey questionnaires avoid interviewer bias and 2) the analysis of data that is obtained through closed-ended questions is relatively straightforward.

De Franzo (no date) cautions that respondents that complete a survey might not feel comfortable to provide answers that present them in an unfavourable manner. Gillham (2008) warns that the response rate to questionnaires is typically low. It is the view of the researcher that, in this instance, the advantages outweighed the disadvantages associated with a survey approach.

3.3 Questionnaire

The data collection instrument that was adopted in this research study is a questionnaire. A closed-ended online questionnaire was used to collect data from the respondents. Khupanga (2024) emphasises that a questionnaire is a versatile and powerful tool for data collection across diverse research domains. He adds “the structured format of a questionnaire promotes standardised collection and analysis that are particularly advantageous for quantitative research endeavours” (Khupanga, 2024). According to Sreejesh, Mohaparta and Anusree (2014) a questionnaire is a structured series of questions that are presented to respondents and is accompanied by clear instructions.

Closed-ended questions were preferred over open-ended questions because they provide greater uniformity of responses and can be more easily processed (Babbie and Mouton, 2001). Closed-ended questions also eliminate irrelevant answers (Dawar, 2023). Closed-ended questions were more appropriate for the research objectives of this study. The disadvantages of closed-ended questions mentioned by Kuhn (2020), whereby respondents are not able to provide in-depth answers and elaborate on their responses, were not applicable in the context of this study.

A self-administered online questionnaire was developed using Microsoft Forms, because it is accessible as part of an institutional subscription to Microsoft 365. A hyperlink to the online questionnaire was distributed to students via their email addresses along with information about the research study. There was no cost associated in developing the questionnaire using Microsoft Forms. Respondents also had access to Microsoft 365 and thus they did not experience any challenges in completing the questionnaire. In line with the requirement of anonymity, the Microsoft Forms based questionnaire was configured in such a manner that no personal identifiable information was captured when the respondents completed the questionnaire.

Nardi states that: “a key element in the achievement of reliable and valid information in survey research is the construction of well-written and manageable questionnaires (2018). A methodological approach was followed in drafting the questionnaire. The questionnaire was

divided into four sections. Section one focused on matters related to informed consent. Section two focused on demographic groupings of the respondents and specifically on the programme the respondents are enrolled in, their current year of study, the scope of information literacy training received and their age. Section three focused on the respondents' perceived use of information literacy competencies. This section was structured in the form of individual statements to which respondents had to indicate their level of agreement according to a bipolar Likert scale ranging from strongly agree, agree, disagree to strongly disagree. The statements included in this section were closely aligned with the learning outcomes of the specific information literacy module that students in the selected programme are required to complete. The mentioned learning outcomes are documented in the module descriptor of the specific module. Section four focused on the respondents' attitudes toward information literacy. Like section three, section four was also structured in the form of individual statements to which respondents had to indicate their level of agreement according to a bipolar Likert scale ranging from strongly agree, agree, disagree to strongly disagree. The statements included in section four focused on the three components of attitudes namely: cognitive, affective and behavioural. An equivalent number of personalised statements were drafted to assess the respondents' cognitive, affective and behavioural aspects of their attitudes towards the information literacy competencies.

Although the assessment of cognitive, affective and behavioural domains is a regular practice in research studies that focus on students' attitudes to information literacy (such as the study of Adekunle, Olla et al., 2019), the focus on students' attitudes towards the three information literacy competencies that form the basis of the information module, is unique.

Taherdoost (2019) holds the view that if a respondent's response to a specific statement is directed to a specific side, such as in the case of this study, then a six-point scale is the most suitable choice. The decision not to use a six-point scale in this study is based on the view that the semantic differentiation of a six-point bipolar scale is more problematic for respondents to provide an accurate answer than a less complicated four-point scale. A semantic differentiation of a six-point scale is also more challenging than a four-point scale. The conviction that a higher scale increases the reliability of the respondents' answers does not hold water. Studies cited by Taherdoost (2019) confirm that a lower scale is easier for respondents to complete compared to a higher scale. In this study an even number of response options was preferred over an odd number of response options to increase the reliability of the survey, but also to eliminate a neutral position that respondents could take when a question may be regarded as ambiguous.

3.4 Target population

According to Bertram and Christiansen (2014), as cited by Molepo (2018), the word population in a research context refers to the number of people, groups or organisations that are included in a research study. The target population includes those individuals from which information is sought and conclusions are drawn (Barnsbee, Barnett, Halton and Nghiem, 2018). The target population from which data was collected was students on all levels of study who are enrolled in a specific healthcare related programme at a University of Technology in South Africa. This healthcare related programme is a four-year qualification. It was first offered in 2020. In 2023 the first cohort of students was on the fourth level of study. According to the university's Management Information System (accessed on 16 April 2024), 233 students are enrolled in the identified programme during the 2024 academic cycle. The 233 students are representative of all levels of study towards the healthcare related programme. Refer to Table 3.1 below for a distribution of students per year of study.

Table 3.1 Distribution of students per study level

Level of study	Number of registered students
First year	58
Second year	59
Third year	57
Fourth year	59
Total	233

The totals included in the table above are inclusive of students who registered for one or more modules that are part of the identified healthcare related programme.

Due to the size of the target population from which data was to be collected, a census survey method was adopted. By adopting a census survey method, a potential sampling error was avoided. Surbhi (2017) highlights that data from a census survey is more accurate and reliable when compared to a sampling survey.

3.5 Data collection procedure

The online survey questionnaire was available for completion for 32 days - from 23 April 2024 until 24 May 2024. The timeline for the completion of the research study and the academic calendar of the University of Technology wherein the study was conducted were the main factors in determining the timeframe during which the online questionnaire was available for completion. On the day when the online survey questionnaire became available for completion, all students who are part of the target population received an invitation via email to participate in the research study.

Between 6 May 2024 and 24 May 2024 students received three additional reminders via email. The online survey questionnaire closed at 23:59 on 24 May 2024.

3.6 Ethical considerations

Participation in the study was voluntary and anonymous. Personal data collected from respondents was limited to their qualification, level of study, age and type of information literacy training received. Data used in this study is anonymised and reported in a group format. Throughout the study the researcher adhered to appropriate confidentiality conventions and applied protocols to maintain strict confidentiality by not recording or storing any personal identifiable information of respondents.

Students that formed the target group of the study were invited through an information leaflet (Appendix 1) to complete an online survey questionnaire (Appendix 2). To enable students to make an informed decision regarding their participation in the study, the information leaflet provided a brief explanation of the purpose of the study as well as the research methodology. The leaflet also outlined the requirements. Clear instructions were provided for the completion of the online questionnaire. Risks and potential benefits associated with the completion of the questionnaire were also outlined in the leaflet. The leaflet emphasised that participation in the study was anonymous and that participants could withdraw from the study during the completion of the questionnaire without any consequences. The contact details of the researcher were also included in the information leaflet to enable participants to communicate directly with the researcher if needed.

Informed consent to participate in the study was obtained through section 1 of the questionnaire. The online questionnaire was configured in such a way that respondents could not continue in completing the questionnaire unless informed consent was granted.

Babbie and Mouton (2001) mention that social research studies may force participants to face aspects of themselves that they do not normally consider. The level of discomfort participants may experience is often due to factors external to a study and involve psychological aspects such as self-esteem, etc. Students who chose to participate in this study may have experienced a slight level of temporary discomfort while completing the questionnaire. The format and design of the questionnaire, including the use of close-ended questions, minimised the level of discomfort a participant may have experienced. The questionnaire was void of questions that may deliberately harm or endanger a participant.

The analysis and reporting of data can inadvertently cause harm to participants of a research study (Babbie and Mouton, 2001). The researcher of this study was aware of the potential harm that can be caused by analysis and reporting practices and applied appropriate academic writing conventions and protocols to eliminate any potential harm to participants.

Approval from the institution's Research and Ethics Committee was obtained prior to the collection of data. Approval from the institution's Research and Ethics Committee included proof that permission was obtained from the relevant Faculty and the relevant Department. Permission to use the email addresses of students who were part of the target group was also obtained. To further mitigate possible ethical concerns, a research ethics checklist was also completed. All the ethical requirements that are set by the University of Technology wherein the study was conducted, as well as requirements set by the Haaga-Helia University of Applied Sciences, were met.

Other ethical concerns associated with this study, such as plagiarism, has been mitigated by applying appropriate citation and referencing techniques. A similarity checking tool was applied to this manuscript in line with the requirements of the Haaga-Helia University of Applied Sciences.

The data of respondents was only accessible to the researcher and a statistician that provided statistical support. Access to questionnaire data was always restricted by passwords. In line with the requirements of the University of Technology wherein the study was conducted, questionnaires are kept for a period of three years after which it will be destroyed.

3.7 Chapter conclusion

This chapter provided an outline of the research methodology adopted in this study. The research methodology is aligned with the research objectives and frames the research questions. The research methodology was explored by considering the research approach and -design, the data collection method, the target population, the data collection procedure and several ethical considerations. The next chapter focuses on data analysis and results.

4 Analysis and results

4.1 Introduction

The purpose of this chapter is to describe methods that were employed to analyse the data collected and to present the research results. The research results are thus the outcomes of the methodology that was described in the preceding chapter. Tegan (2022) emphasises that results should be reported concisely and objectively following a logical order. According to Verma (2023) there are three common approaches used in statistics and data analysis to explore and understand data namely: univariate analysis, bivariate analysis and multivariate analysis. “Univariate analysis involves the examination of a single variable at a time. Bivariate analysis involves the analysis of two variables simultaneously to determine if there is a relationship between them. Multivariate analysis involves the simultaneous analysis of three or more variables to understand the complex relationships between them” (Verma, 2023).

As advocated by Nardi (2018) and in line with research objectives one and two, univariate analysis was first conducted to describe the characteristics of individual variables and to assess its tendency, dispersion and shape. This was followed by bivariate analysis, in line with research objectives three and four, using correlation coefficients and analysis of variance.

Rautenbach (2020) distinguishes between four levels of data measurement, namely: nominal, ordinal, interval and ratio. These levels of measurement have an impact on the technique to be used in analysis of the data (Rautenbach, 2020). Hillier (2023) differentiates between descriptive, diagnostic, predictive and prescriptive data analysis. Descriptive analytics is explanatory and involves the breaking down of data which is then described using descriptive statistics (Hillier, 2020).

For the purpose of answering research questions one and two, a descriptive analytical approach was followed supported by descriptive statistics. According to Hayes (2023) the purpose of descriptive statistics is to summarise or describe the characteristics of a data set. Bhandari (2020) points out that there are three main categories of descriptive statistics: 1) distribution, which is concerned with the frequency of each value, 2) central tendency, which is concerned with the averages of values, including mean, median and mode and 3) variability, which is concerned with how spread out the values are, including range standard deviation, variance and interquartile range.

Research question three was answered using correlational statistical methodology. “Correlational analysis is used to discover if there is a relationship between two variables or datasets and how strong that relationship may be” (James, no date). Research question four was answered using

analysis of variance. Simkus reports that analysis of variance is used to “determine if there is a statistically significant difference between two or more categorical groups” (2023).

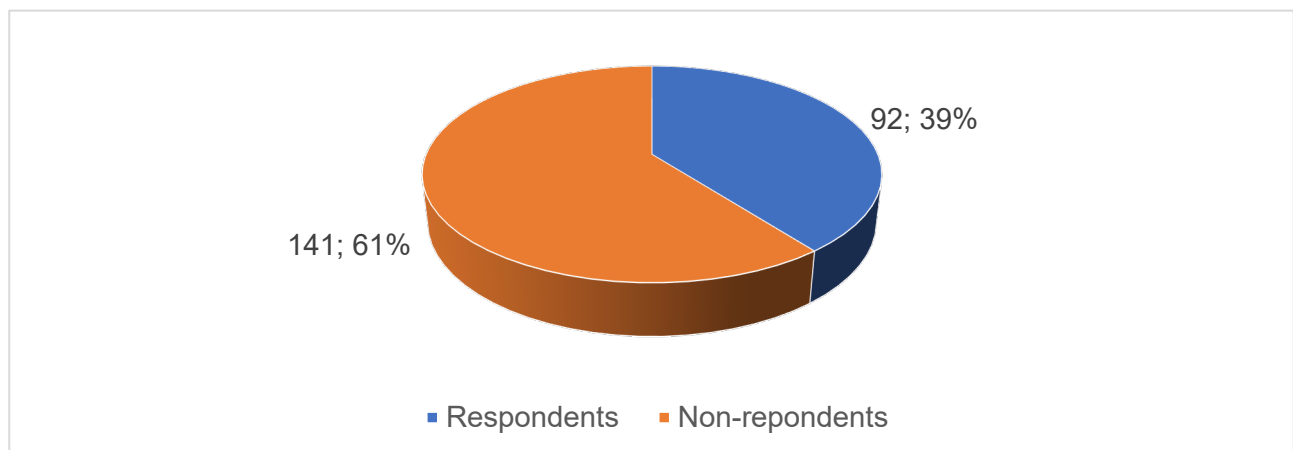
Data collected from respondents was analysed using SPSS® (Statistical Package for Social Sciences) Statistics, a software application of the International Business Machines Corporation (IBM). The use of SPSS® Statistics was the preferred application for data analysis, because the researcher had access to the software application without any direct costs. The chosen software application also accommodated all the different types of analysis that were undertaken in this study.

In the rest of this chapter data is described in the form of tables, graphs and statistics.

4.2 Number of participants

The target population consists of 233 students who are all part of a specific healthcare related programme at a University of Technology in South Africa. Figure 4.1 below indicates the number of respondents compared to non-respondents.

Figure 4.1. Number of respondents versus non-respondents



92 students responded by completing the online questionnaire, while 141 students did not respond. This constitutes a response rate of 39% and a non-response rate of 61% respectively.

4.3 Results of questionnaire

4.3.1 Demographic information

According to Hayes (2024) demographics are statistics that describe populations and their characteristics. Section 2 of the questionnaire focused on the demographic characteristics of the respondents such as the specific qualification they are registered for, the current study level of the respondents, the respondents' age according to predefined groupings and the information literacy training the respondents received. It should be noted that not all the characteristics of the respondents played an equally important role as variables.

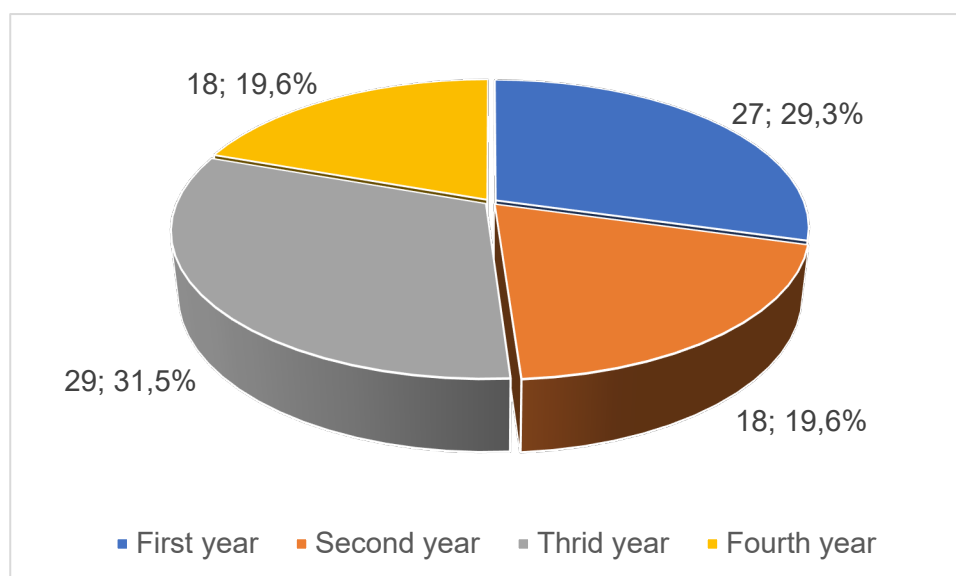
4.3.1.1 Current enrolment status of respondents

The focus of this study is limited to students who are enrolled in a specific healthcare related programme that is offered by a University of Technology in South Africa. The identification that respondents are indeed enrolled in the specific programme, this is a Bachelor of Nursing, forms an important element of the study. It should be noted that the academic department at the University of Technology in South Africa that offers the specific health care related programme also offers two other qualifications. All 92 (100%) respondents indicated that they are enrolled in the specific healthcare related programme, i.e. a Bachelor of Nursing.

4.3.1.2 Study level

Figure 4.2 represents the study level of the respondents. The specific healthcare related programme is a four-year qualification. Subsequently, the study level of respondents ranges between first, second, third and fourth year of study.

Figure 4.2 Study level of respondents

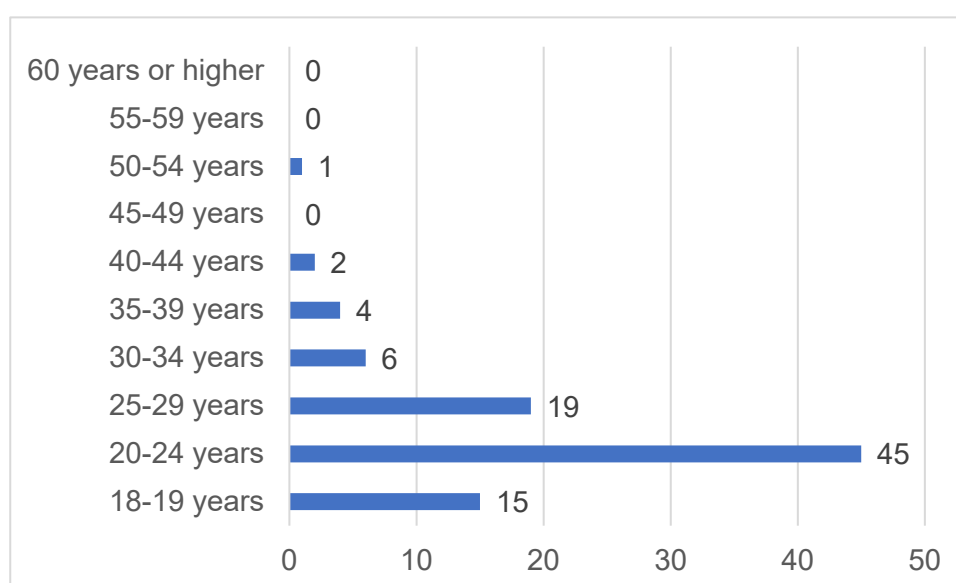


As illustrated in Figure 4.2, 29,3% of the respondents were in their first year of study, 19,6% of the respondents in their second year of study, 31,5% in their third year of study and 19,6% in their fourth year. The dispersion of respondents is normal.

4.3.1.3 Age of respondents

The age of respondents is articulated in Figure 4.3.

Figure 4.3 Age categories of respondents

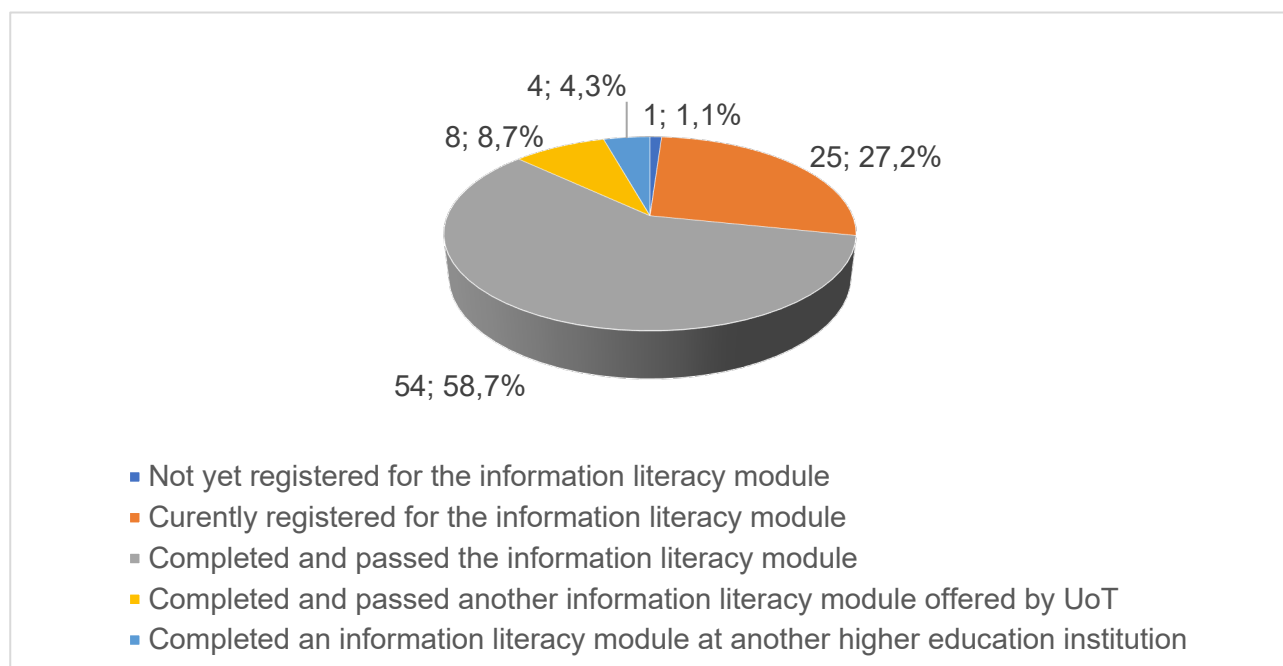


The figure shows that the majority of respondents - this is 48,9% (N = 45) - are between 20 and 24 years of age. 19 respondents are between 25 and 29 years of age. This constitutes 20,7% of all respondents. The third highest age range at 16,3% is respondents who are between 18 and 19 years of age. 85,9% (N = 79) of the respondents are 29 years or younger while the remaining 15,1% (N = 13) of the respondents are 30 years of age or older. Only 1 respondent is between 50 and 54 years of age.

4.3.1.4 Information literacy training received

In the last question of Section 2 participants were asked to indicate the type of information literacy training they received. The responses of respondents are captured in Figure 4.4 below.

Figure 4.4 Information literacy training received



The majority of respondents (N = 54, 58,7%) indicated that they successfully completed and passed the required information literacy module. 25 (i.e. 27,2%) respondents indicated that they are currently registered for the information literacy module. These respondents are yet to complete the assessments and pass the module. A further 8,7% of the respondents (N = 8) indicated that they completed and passed another information literacy module that is offered by the same University of Technology. At the University of Technology where the research study was conducted it is the practice that students can obtain exemption if they completed an information literacy module that is equivalent to the module that they are required to complete. Lastly, 4 respondents (i.e. 4,3 %) indicated they had completed an information literacy module that was

offered by another higher education institution. At the University of Technology where this research study was conducted it is also the practice that students can obtain exemption if they completed a credit bearing information literacy module that is regarded as equivalent to the information literacy module to be completed. 98,9% of the respondents (N = 91) indicated that they either completed an information literacy module or are in the process of completing an information literacy module.

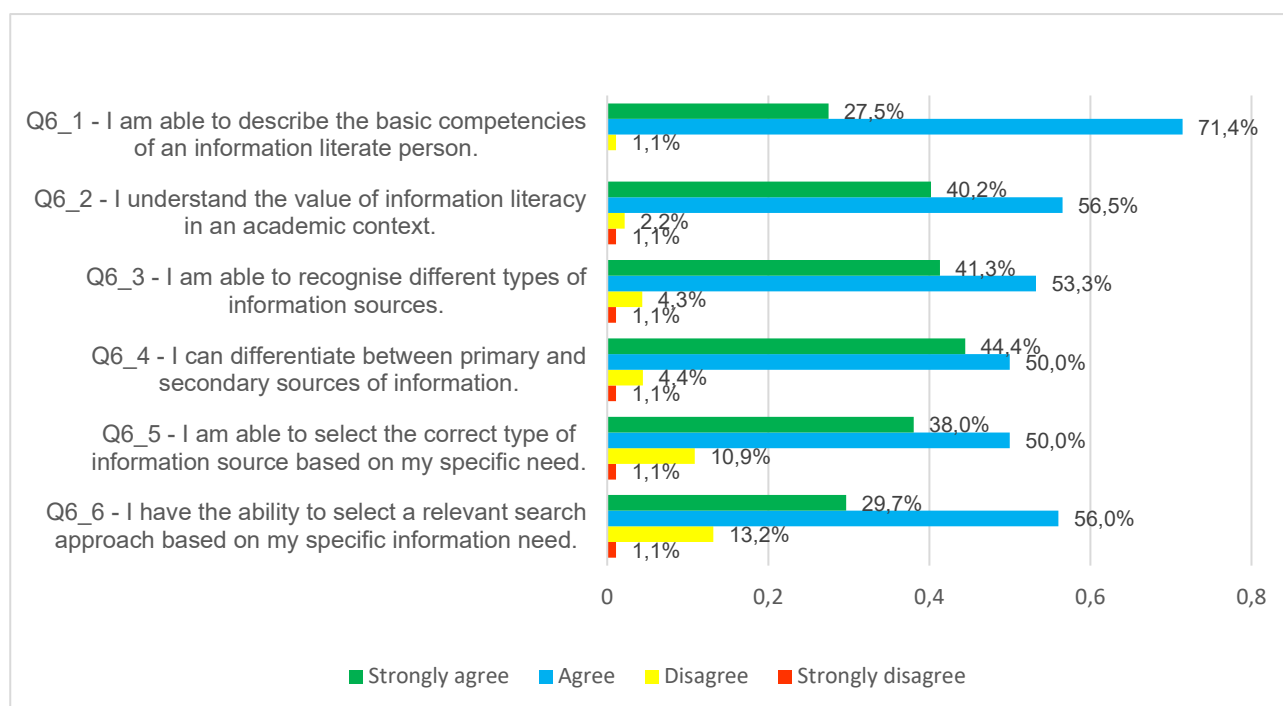
4.3.2 Students' perceptions about their use of information literacy competencies

Section 3 of the questionnaire focused on students' use of information literacy competencies. This section consisted of four questions. Each of the four questions focused on a particular aspect of the information literacy competencies that form part of the information literacy module. Each of the four questions consisted of several personalised statements wherein the respondents had to indicate their level of agreement in line with a four-point Likert scale ranging from strongly agree, agree, disagree and strongly disagree.

4.3.2.1 General statements about information literacy

In question 6, which is the first question that forms part of Section 3 of the questionnaire, respondents indicated their level of agreement to six personalised general statements. Percentages of the responses of students are included in Figure 4.5. below.

Figure 4.5. General statements about information literacy



4.3.2.1.1 Describing the competencies of an information literate person

Statement 6_1 was completed by 91 respondents. Figure 4.5. shows that 27,5% of the respondents strongly agree that they are able to describe the competencies of an information literate person, while 71,4% respondents agree with the statement. Only 1,1% of the respondents disagreed with the statement that they are able to describe the competencies of an information literate person. 98,9% of the respondents have the perception that they are able describe the competencies of an information literate person, while 1,1% of the respondents have the perception that they are not able to describe the competencies of an information literate person.

4.3.2.1.2 Understanding the value of information literacy in an academic context

Statement 6_2 was completed by all 92 respondents. Figure 4.5. indicates that 40,2% of the respondents strongly agree that they understand the value of information literacy in an academic environment, while 56,5% of the respondents agree with the statement. 2,2% of the respondents indicated that they disagree with the statement and 1,1% indicated that they strongly disagree. 96,7% of the respondents have the perception that they understand the value of information

literacy in an academic environment - 3,3% indicated that they do not understand the value of information literacy in an academic environment.

4.3.2.1.3 Recognising different types of information sources

Statement 6_3 was completed by all 92 respondents. Figure 4.5. illustrates that 41,3% of the respondents strongly agree that they are able to recognise different types of information sources. 53,3% of the respondents agree with the statement. 4,3% of the respondents disagree with the statement while 1,1% indicated that they strongly disagree. 94,6% of the respondents have the perception that they are able to recognise different types of information sources while 5,4% of the respondents hold the view that they are not able to recognise different types of information sources.

4.3.2.1.4 Differentiating between primary and secondary sources of information

Statement 6_4, which focused on the students' ability to differentiate between primary and secondary sources of information, was completed by 90 of the 92 respondents. Figure 4.5. shows that 44,4% of the respondents strongly agree that they are able to differentiate between primary and secondary sources of information. 50,0% of the respondents indicated that they agree with the statement. On the other hand, 4,4% of the respondents disagree with the statement and 1,1% of the respondents indicated that they strongly disagree. 94,4% of the respondents hold the view that they are able to differentiate between primary and secondary sources of information, while 5,6% of the respondents have the perception that they are not able to differentiate between primary and secondary sources of information.

4.3.2.1.5 Selecting the correct type of information source based on a specific information need

Statement 6_5 was completed by all 92 respondents. Figure 4.5. indicates that 38,0% of the respondents strongly agree that they are able to select the correct type of information source based on a specific information need. A further 50,0% of the respondents agree with the statement. However, 10,9% of the respondents disagree with the statement while 1,1% of the respondents strongly disagree. A total of 88% of the respondents have the perception that they are able to select the correct type of information source based on a specific information need. 12% of the respondents indicated that they are not able to select the correct type of information source based on a specific information need.

4.3.2.1.6 Selecting a relevant search approach based on a specific information need

Statement 6_6 was completed by 91 of the 92 respondents. With reference to the students' ability to select a relevant search approach based on a specific information need, 29,7% of the respondents indicated, as illustrated in Figure 4.5, that they strongly agree with the statement. 56,0% of the respondents indicated that they agree. However, 13,2% of the respondents indicated that they disagree with the statement and 1,1% of the respondents strongly disagree. 85,7% of the respondents hold the view that they are able to select a relevant search approach based on a specific information need. 14,3% felt that they are not able to select a relevant search approach for a specific information need.

Figure 4.5. shows that the majority of respondents have the perception that they: 1) can describe the competencies of an information literate person, 2) understand the value of information literacy in an academic context, 3) are able to recognise the different types of information sources, 4) can differentiate between primary and secondary sources of information, 5) have the ability to select the correct type of information sources for a specific information need and 6) are able to select the relevant search approach based on a specific information need. It should be noted that a small portion of the respondents hold the view that they are not able to perform the functions listed above.

There is a variation in the responses of respondents when the statements 6_1-6_6 are compared with each other. The overall percentages of respondents who strongly agree and agree with statements 6_1-6_6 are included in Figure 4.6.

Figure 4.6 Overall percentages of responses of respondents who strongly agree and agree with statements 6_1-6_6

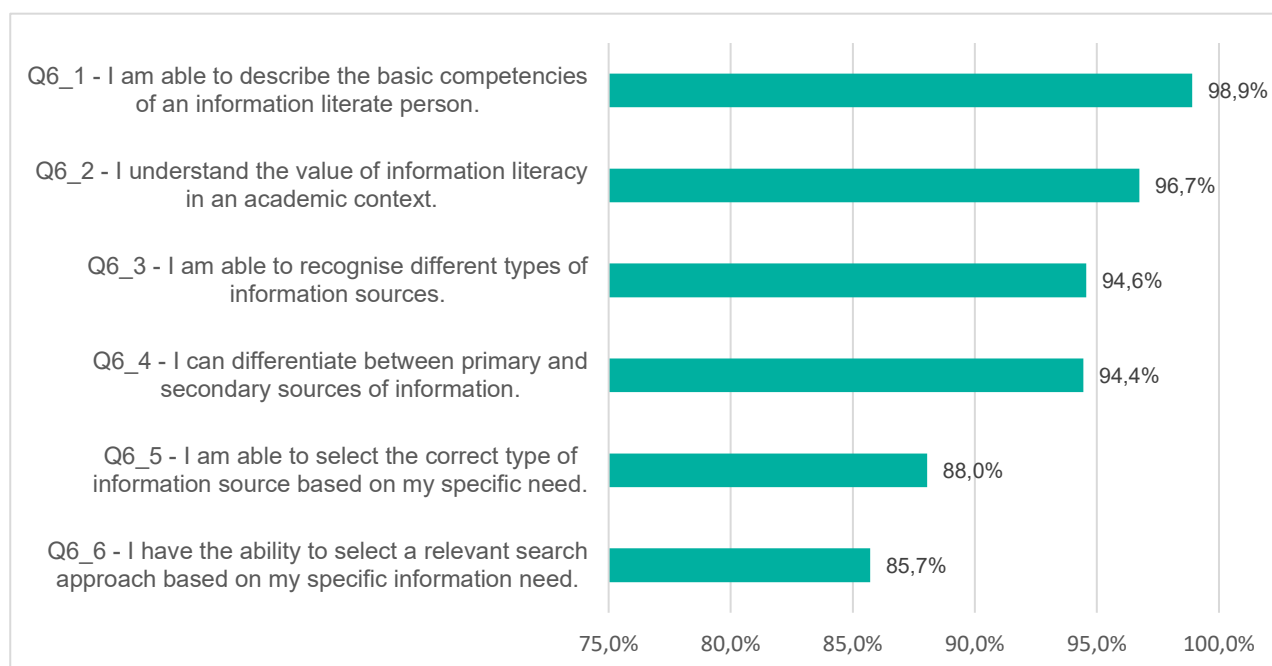


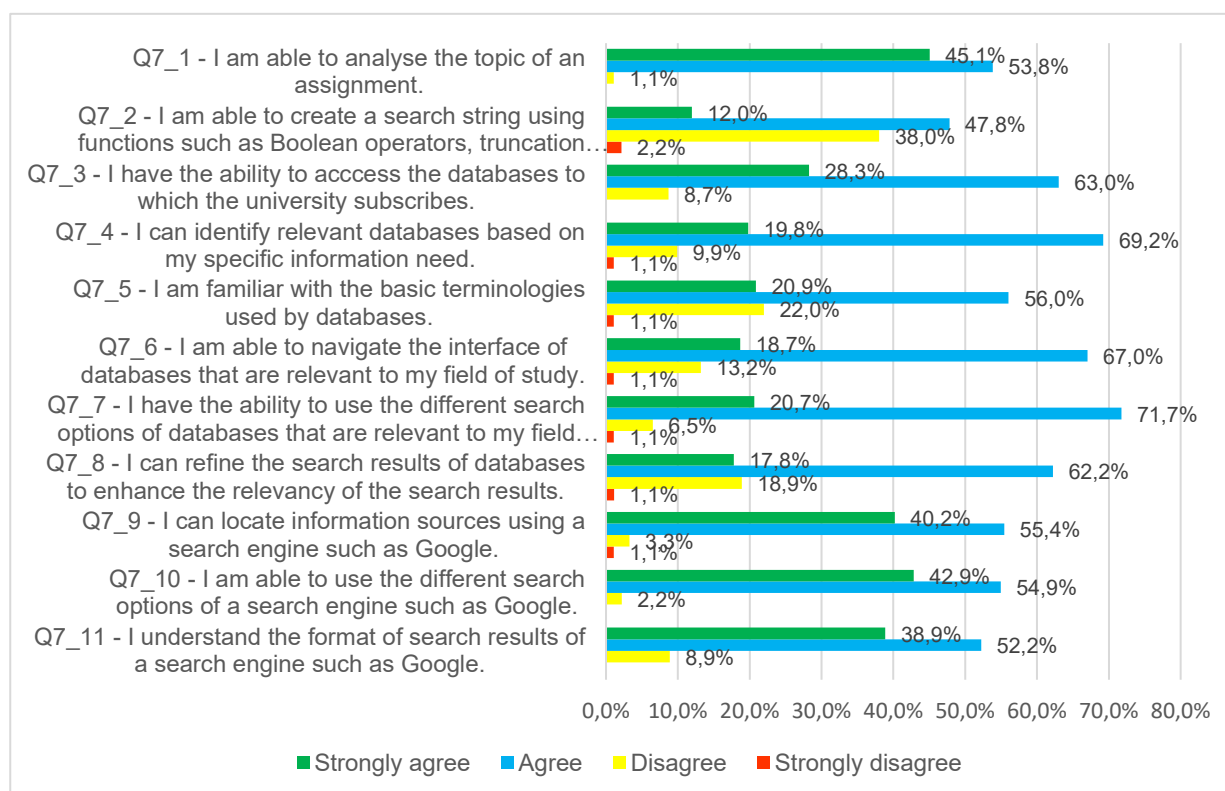
Figure 4.6 shows that the responses of respondents who agree and strongly agree with statement 6_1 is 98,9 %, which is the highest of statements 6_1-6_6, followed by statement 6_2 with 96,7%. The responses of respondents who agree and strongly agree for statement 6_6 is 85,7%, which is the lowest of statements 6_1-6_6. With 88,0% statement 6_5 has the second lowest score. Respondents thus rate their ability to describe the competencies of an information literate person higher than their ability to select a specific search approach based on a specific information need and their ability to select the correct type of information source based on a specific information need. As indicated elsewhere in this research study, the statements that form part of Section 3 are derived from the learning outcomes of the information literacy module that the students are required to complete. The difference in percentages, as reflected in Figure 4.6, is indicative that the level of the respondents' abilities and skills are varied.

4.3.2.2 Statements about the competency to locate information sources

In Question 7, which is the second question of Section 3, students shared their perceptions about their ability to locate information sources. The ability to locate information sources is the first of the three information literacy competencies that form part of the information literacy module the students must complete. It is also the first of three information literacy competencies of an information literate person in line with the information literacy framework of the University of

Technology that forms the focus of this research study. Question 7 consists of 11 personalised statements to which the respondents indicated their level of agreement. Figure 4.7 below includes the percentages of the responses of the respondents.

Figure 4.7 Level of agreement of statements regarding the competency to locate information sources



4.3.2.2.1 Analysing the topic of an assignment

Statement 7_1 was completed by 91 respondents. Figure 4.7 shows that 45,1% of the respondents indicated that they strongly agree with the statement that they are able to analyse the topic of an assignment. 53,8% indicated that they agree. 1,1% of the respondents indicated that they disagree with the statement. 98,9% of the respondents, have the perception that they are able analyse the topic of an assignment. The ability to analyse an assignment topic is an important prerequisite to locate information relevant to an assignment topic. Just 1,1% of the respondents indicated that they are not able to analyse the topic of an assignment.

4.3.2.2.2 Creating a search string using Boolean operators, truncation and parentheses

Statement 7_2 focuses on students' ability to create a search string using functions such as Boolean operators, truncation and parentheses. All 92 respondents completed the statement by selecting an appropriate response. Figure 4.7 illustrates that 12,0% of the respondents strongly agree with the statement, while a further 47,8% of the respondents indicated that they agree. However, 38,0% of the respondents disagree with the statement, while 2,2% of the respondents strongly disagree. 59,8% of the respondents have the perception that they can create a search string using functions such as Boolean operators, truncation and parentheses. Yet, with 40,2%, a significant number of respondents indicated that they are not able to create a search string using the mentioned functions.

4.3.2.2.3 Accessing databases to which the university subscribes

Statement 7_3 was completed by all the respondents. This statement relates to the ability to access the databases to which the University of Technology subscribes. The databases are accessible via the webpages of the Department of Library and Information Services. Figure 4.7 shows that 28,3% of the respondents strongly agree that they are able to access the databases to which the university subscribes. A further 63,0% of the respondents agree with the statement. 8,7% of the respondents indicated that they disagree. 91,3% of the respondents indicated that they are able to access the databases to which the university subscribes. 8,7% of the respondents indicated that they are not able to access the databases of the university.

4.3.2.2.4 Identifying relevant databases based on a specific information need

Statement 7_4 was completed by 91 of the 92 respondents. The statement focuses on students' ability to identify relevant databases based on a specific information need. As depicted in Figure 4.7, 19,8% of the respondents strongly agree with the statement and 69,2% of the respondents agree. 9,9% of the respondents indicated that they disagree and 1,1% of the respondents indicated that they strongly disagree. 89,0% of the respondents indicated that they are able to identify databases that are relevant to a specific information need, while 11,0 % of the respondents indicated that they are not able to identify relevant databases for a specific information need they have.

4.3.2.2.5 Familiarity with basic terminologies used by databases

Statement 7_5 was completed by 91 of the respondents. According to Figure 4.7, 20,9 % of the respondents indicated that they strongly agree with the statement that they are familiar with basic terminologies used by databases, while 56,0% of the respondents agree with the statement. 22,0% of the respondents indicated that they disagree and 1,1% of the respondents strongly disagree. 76,9% of the respondents have the perception that they are familiar with the basic terminologies used by databases. 23,1% of the respondents hold the view that they are not familiar with the basic terminologies used by databases.

4.3.2.2.6 Navigating the interfaces of relevant databases

Statement 7_6 focuses on students' ability to navigate the interfaces of databases that are relevant to their field of study. 91 respondents completed this statement. Figure 4.7 indicates that 18,7% of the respondents strongly agree, 67,0% of the respondents agree, 13,2% of the respondents disagree and 1,1% of the respondents strongly disagree. 85,7% of the respondents hold the view that they are able to navigate the interfaces of databases that are relevant to their field of study while 14,3% of the respondents indicated that they are not able to navigate the interfaces of databases relevant to their field of study.

4.3.2.2.7 Using search options of databases

Statement 7_7 was completed by all 92 of the respondents. This statement relates to the ability of students to use the different search options of databases that are relevant to their field of study. Figure 4.7 shows that 20,7% of the respondents strongly agree with the statement. A further 67,0% of the respondents agree, while 6,5% of the respondents disagree and 1,1% strongly disagree. 85,7 of the respondents indicated that they are able to use the different search options of databases that are relevant to their field of study, while 14,3% of the respondents hold the view that they are not able to use the different search options of relevant databases.

4.3.2.2.8 Refining search results of databases

90 respondents completed statement 7_8. Figure 4.7 illustrates that 17,8% of the respondents indicated that they strongly agree with the statement that they are able to refine the search results of databases to enhance the relevancy of the search results. A further 62,2% of the respondents

agree with the statement. 18,9% of the respondents disagree with the statement and 1,1% of the respondents strongly disagree. 80% of the respondents have the perception that they are able to refine the search results of databases to enhance the relevancy of their search results. 20% of the respondents indicated that they are not able to perform this function.

4.3.2.2.9 Locating information sources using search engines

Statements 7_3-7_8 focus on aspects related to databases to find information. Statements 7_9-7_11 focus on aspects related to search engines to locate information. Statement 7_9 relates to the ability of students to locate information sources using a search engine such as Google. This statement was completed by all 92 of the respondents. Figure 4.7 indicates that 40,2% of the respondents strongly agree with the statement. A further 55,4% of the respondents agree. 3,3% of the respondents disagree and 1,1% of the respondents strongly disagree. When the responses of respondents who indicated that they either strongly agree or agree with the statement are grouped together, 95,6% of the respondents have the perception that they are able to locate information using a search engine such as Google. 4,4% of the respondents indicated that they are unable to perform this function.

4.3.2.2.10 Using search options of a search engine such as Google

Statement 7_10, which was completed by 91 respondents, focuses on students' ability to use different search options of a search engine such as Google. As illustrated in Figure 4.7, 42,9% of the respondents indicated that they strongly agree with the statement, 54,9% of the respondents indicated that they agree and 2,2% of the respondents indicated that they disagree with the statement. 97,8% of the respondents hold the view that they are able to use the different search options of a search engine such as Google, while 2,2% of the respondents indicated that they are not able to use the different search options.

4.3.2.2.11 Understanding the format of search results of a search engine such as Google

Statement 7_11, which is the final statement that relates to the information literacy competency to locate information, was completed by 90 respondents. Figure 4.7 shows that 38,9% of the respondents strongly agree that they understand the format of search results of a search engine such as Google. A further 52,2% of the respondents indicated that they agree with the statement. 8,9% of the respondents indicated that they disagree with the statement. 91,1% of the respondents

indicated that they understand the format of the search results of a search engine such as Google, while 8,9% of the respondents indicated that they do not understand the format of the search results.

The overall percentages of responses of respondents who strongly agree and agree with statements 7_1-7_11 are illustrated in Figure 4.8 below.

Figure 4.8 Overall percentages of responses of respondents who strongly agree and agree with statements 7_1-7_11

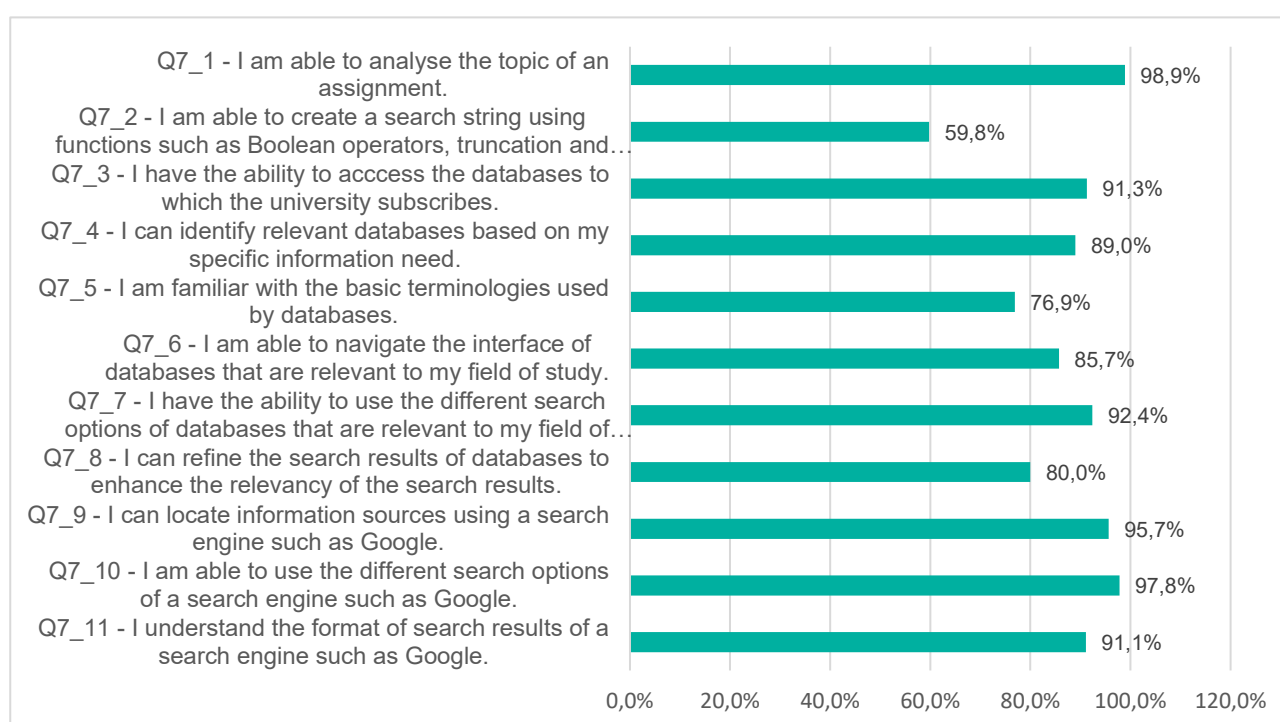


Figure 4.8 shows there is a variation in the responses of respondents who strongly agree and agree when statements 7_1-7_11 are compared with each other. Statements 7_1-7_11 are derived from the learning outcomes of the information literacy module that the students in the specific healthcare related programme is required to complete. Statements 7_1-7_11 are specifically related to the learning outcomes of the information literacy competency to locate information sources. 98,9% of the respondents indicated in statement 7_1 that they either strongly agree or agree that they are able to analyse the topic of an assignment. The ability to analyse the topic of an assignment is part of the process to determine the scope and extent of an information need. On the other hand, a notably lower number of respondents (i.e. 59,8%) indicated that they agree or strongly agree with statement 7_2 which relates to the ability to compile a search string using functions such as Boolean operators, truncation and parentheses. There is a strong correlation between a search string and the relevancy of search results. Search strings that are precise yet comprehensive and inclusive yield more relevant search results, which, in turn,

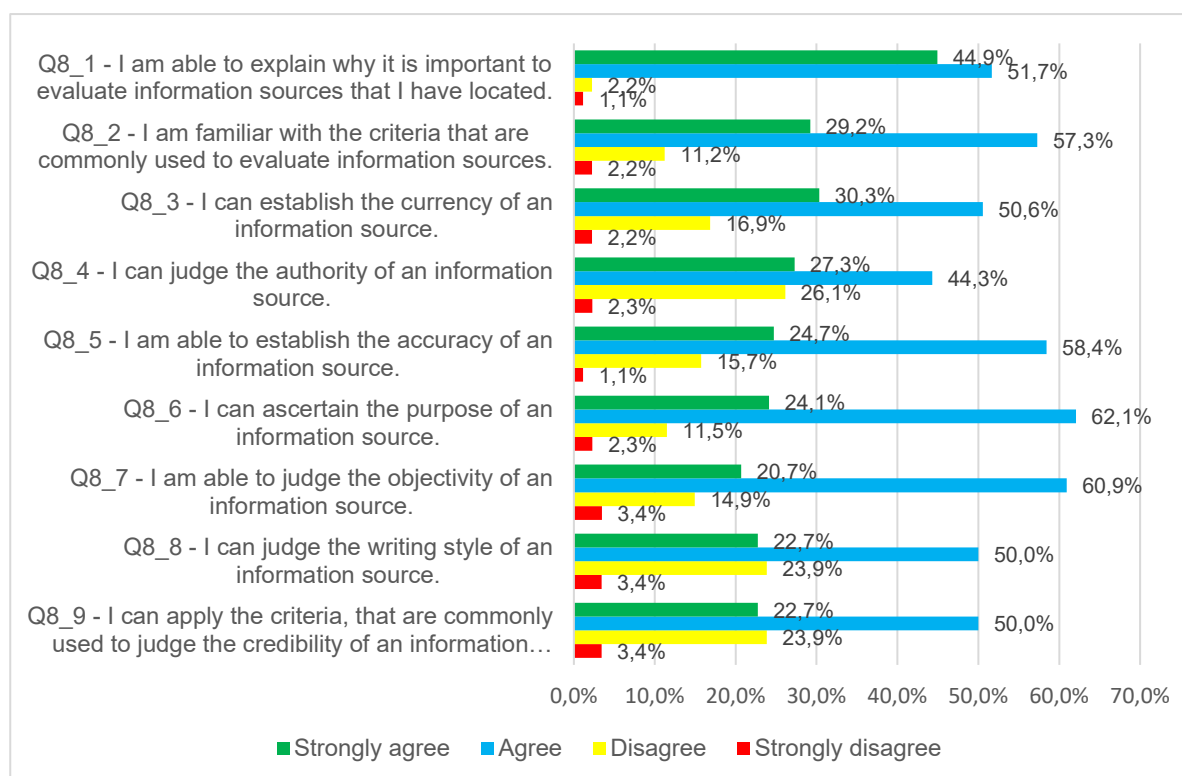
increase the quality of information included in an assignment. The respondents' ability to create a search string has a negative impact on the respondents' overall level of competency to locate information sources for an assignment.

Statements 7_3-7_8 focus on the knowledge, abilities and skills that students in the healthcare related programme must have about the academic databases that the University of Technology subscribes to. Information sources that are accessible via academic databases are generally regarded as credible and authoritative due to peer review- and other quality assurance processes. In statement 7_5, 76,9% of the respondents indicated that they either strongly agree or agree that they are familiar with the basic terminologies used by databases. This percentage is the lowest for statements 7_3-7_8, which indicates that the respondents' level of familiarity with basic terminologies used by databases contributes negatively to their ability to locate information sources using the academic databases that the University of Technology subscribes to. Figure 4.8 also shows that in statement 7_8, 80,0% of the respondents indicated that they strongly agree or agree with the statement. When this percentage is compared to the percentages of statements 7_3-7_8 the respondents' level of proficiency to refine search results, in order to enhance the relevancy thereof, compromises their ability to locate relevant information sources using academic databases.

4.3.2.3 Statements about the information literacy competency to evaluate information sources

Question 8 is the second question of Section 3. In this question, students were prompted to share their perceptions about their ability to evaluate information sources. The ability to evaluate information sources is the second of the three information literacy competencies that form part of the information literacy module the students must complete. It is also the second of three information literacy competencies of an information literate person in line with the information literacy framework of the University of Technology that forms the focus of this research study. Question 7 consists of 9 personalised statements in which the respondents indicated their level of agreement. Figure 4.9 below includes the percentages of the responses of the respondents.

Figure 4.9 Statements related to the competency to evaluate information sources



4.3.2.3.1 Explaining the importance to evaluate located information sources

Statement 8_1 focuses on the importance of evaluating information sources that have been located. 89 of the 92 respondents completed this statement. Figure 4.9 shows that 44,9% of the respondents indicated that they strongly agree that they are able to explain why it is important to evaluate information sources that have been located. A further 51,7% of the respondents agree to the statement. However, 2,2% of the respondents disagree and 1,1% of the respondents strongly disagree. 96,6% of the respondents have the perception that they are able to express why it is important to evaluate information sources, while 3,4% of the respondents are not able to explain the importance of evaluating information sources.

4.3.2.3.2 Familiarity with commonly used evaluation criteria

In the information literacy modules that are offered at the University of Technology where the research study was conducted, a set of generic criteria are presented to students that can be used to evaluate any type of information source. In statement 8_2 students were prompted to indicate their familiarity with these criteria that are commonly used to evaluate information sources. Of the

92 respondents, 3 did not complete this statement. Figure 4.9 indicates the response of respondents. 29,2% of the respondents indicated that they strongly agree with the statement, 57,3% of the respondents indicated that they agree, 11,2% of the respondents indicated that they disagree and 2,2% strongly disagree. 86,5% of the respondents hold the view that they are familiar with criteria that are commonly used to evaluate information sources, while 13,5% of the respondents are not familiar with the commonly used criteria.

4.3.2.3.3 Establishing the currency of an information source

Statements 8_3-8_8 focus on specific evaluation criteria. Statement 8_3 focuses on the currency of an information source. In the information literacy modules that are offered at the University of Technology that forms the focus of this research study, currency refers to the extent to which information sources are regarded as current or up to date. This statement was completed by 89 of the 92 respondents. Figure 4.9 shows that 30,3% of the respondents indicated that they strongly agree that they can establish the currency of an information source. 50,6% of the respondents agree with the statement, while 16,9% of the respondents disagree and 2,2% strongly disagree. 80,9% of the respondents hold the view that they are able to establish the currency of an information source, while 19,1% of the respondents hold the view that they are not able to establish the currency of an information source.

4.3.2.3.4 Judging the authority of an information source

Statement 8_4 relates to the ability of students to judge the authority of an information source. In the information literacy modules of the University of Technology, authority refers to the credentials and affiliation of the author of an information source. This statement was completed by 88 respondents. As seen in Figure 4.9, 27,3% of the respondents indicated that they strongly agree with the statement that they can judge the authority of an information source. A further 44,3% of the respondents indicated that they agree with the statement. A notable 26,1% of the respondents indicated that they disagree, while 2,3% of the respondents strongly disagree. At 71,6% the majority of the respondents have the perception that they are able to judge the authority of an information source, while 28,4% of the respondents feel that they are not able to judge the authority of an information source.

4.3.2.3.5 Establishing the accuracy of an information source

Statement 8_5 was completed by 89 respondents. In this statement students had to indicate the level of agreement of their ability to establish the accuracy of an information source. In the information literacy module, the accuracy of an information source refers to the reliability, truthfulness and correctness of data and information that are supported by accompanying evidence. Figure 4.9 indicates that 24,7% of the respondents strongly agree with the statement that they can establish the accuracy of an information source. 58,4% of the respondents agree with the statement, while 15,7% disagree and 1,1% strongly disagree. 83,1% of the respondents hold the view that they can establish the accuracy of an information source, while 16,9% of the respondents indicated that they are unable to establish the accuracy of an information source.

4.3.2.3.6 Ascertaining the purpose of an information source

Statement 8_6 focuses on the ability of students to ascertain the purpose of an information source. In the information literacy module of the University of Technology, the purpose of an information sources relates to the reason the information exists. On a fundamental level, information sources exist to inform, teach, entertain or persuade and are often a combination of these factors. 87 of the 92 respondents completed this statement. Figure 4.9 illustrates that 24,1% of the respondents indicated that they strongly agree with the statement, 62,1% of the respondents indicated that they agree, 11,5% indicated that they disagree and 1,1% of the respondents indicated that they strongly disagree. A total of 86,2% of the respondents indicated that they are able to ascertain the purpose of an information source. 13,8% of the respondents indicated that they are unable to do so.

4.3.2.3.7 Judging the objectivity of an information source

Statement 8_7 deals with students' ability to judge the objectivity of an information source. In the information literacy module that is part of a specific healthcare related programme, the criterion of objectivity refers to the ability to determine the extent to which an information source is biased or not, by considering if the information included in an information source is based on facts or opinion or can be regarded as propaganda. 87 of the 92 respondents completed this statement. Figure 4.9 illustrates that 20,7% of the respondents strongly agree with the statement. A further 60,9% of the respondents indicated that they agree with the statement. 14,9% of the respondents indicated that they disagree and 3,4% indicated that they strongly disagree. 81,6% of the respondents indicated that they are able to judge the objectivity of an information source, while 18,4% of the respondents indicated that they are not able to judge the objectivity of an information source.

4.3.2.3.8 Judging the writing style of an information source

Statement 8_8 addresses the last criterion of the generic evaluation criteria, namely the ability to judge the writing style of an information source. In the information literacy module, the writing style refers to the extent to which an information source is systematically and clearly documented, as well as the extent to which grammar and vocabulary are typical of scholarly writing. Statement 8_8 was completed by 88 of the 92 respondents. According to Figure 4.9, 22,7% of the respondents indicated that they strongly agree with the statement that they can judge the writing style of an information source, while 50,0% indicated that they agree with the statement. On the other hand, 23,9% of the respondents indicated that they disagree with the statement and 3,4% indicated that they strongly disagree. 72,7% of the respondents hold the view that they are able to judge the writing style of an information source, while 27,3% indicated that they are not able to do it.

4.3.2.3.9 Applying the criteria in practice to judge the credibility of an information source

Statement 8_9 is the last statement that forms part of Question 8. This statement focuses on students' ability to apply the commonly used evaluation criteria in practice. The statement was completed by 88 respondents. Figure 4.9 shows that 22,7% of the respondents indicated that they strongly agree with the statement that they can apply the evaluation criteria in practice. A further 50,0% of the respondents indicated that they agree with the statement, while 23,9% of the respondents indicated that they disagree. 3,4 % indicated that they strongly disagree. A total of 72,7% of the respondents indicated that they can apply the commonly used evaluation criteria in practice, while 27,3 % of the respondents indicated that they are not able to apply the evaluation criteria in practice.

The overall percentages of responses of respondents who strongly agree and agree with statements 8_1-8_9 are shown in Figure 4.10 below.

Figure 4.10 Overall percentages of responses of respondents who strongly agree and agree with statements 8_1-8_9

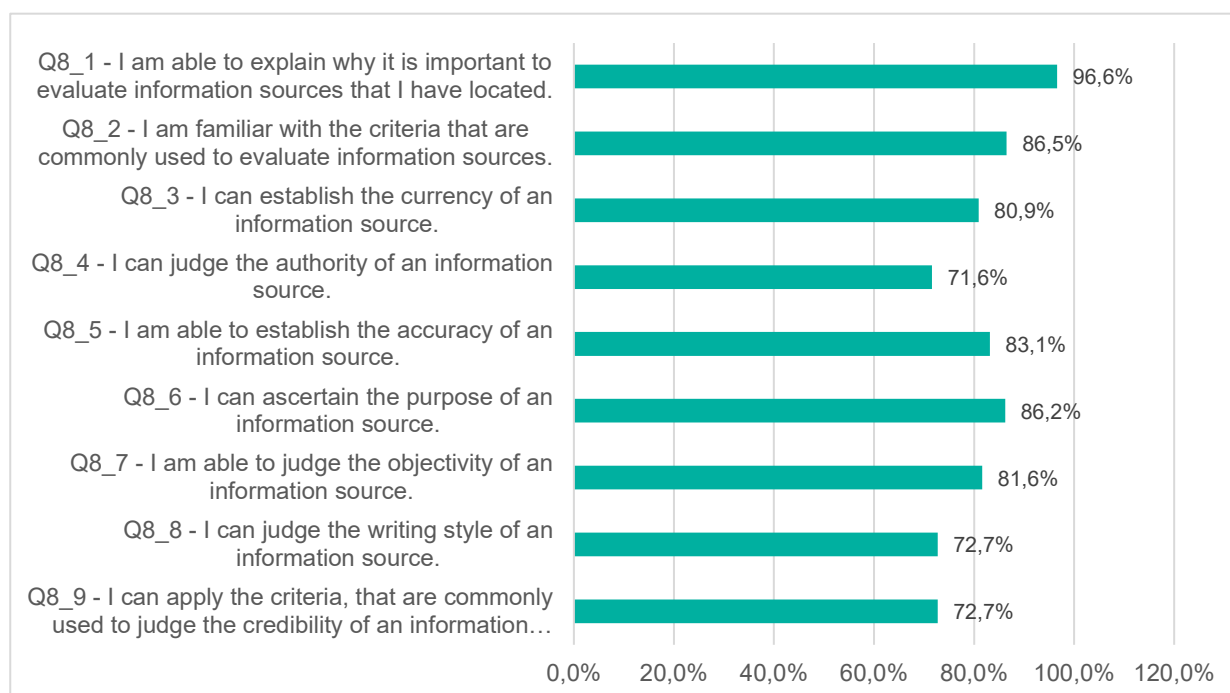


Figure 4.10 shows there is a variation in the responses of respondents who strongly agree and agree when statements 8_1-8_9 are compared with each other. Statements 8_1-8_9 are derived from the learning outcomes of the information literacy module that the students who enrolled in the specific healthcare related programme are required to complete. Statements 8_1-8_9 are specifically related to the information literacy competency to evaluate information sources that have been located.

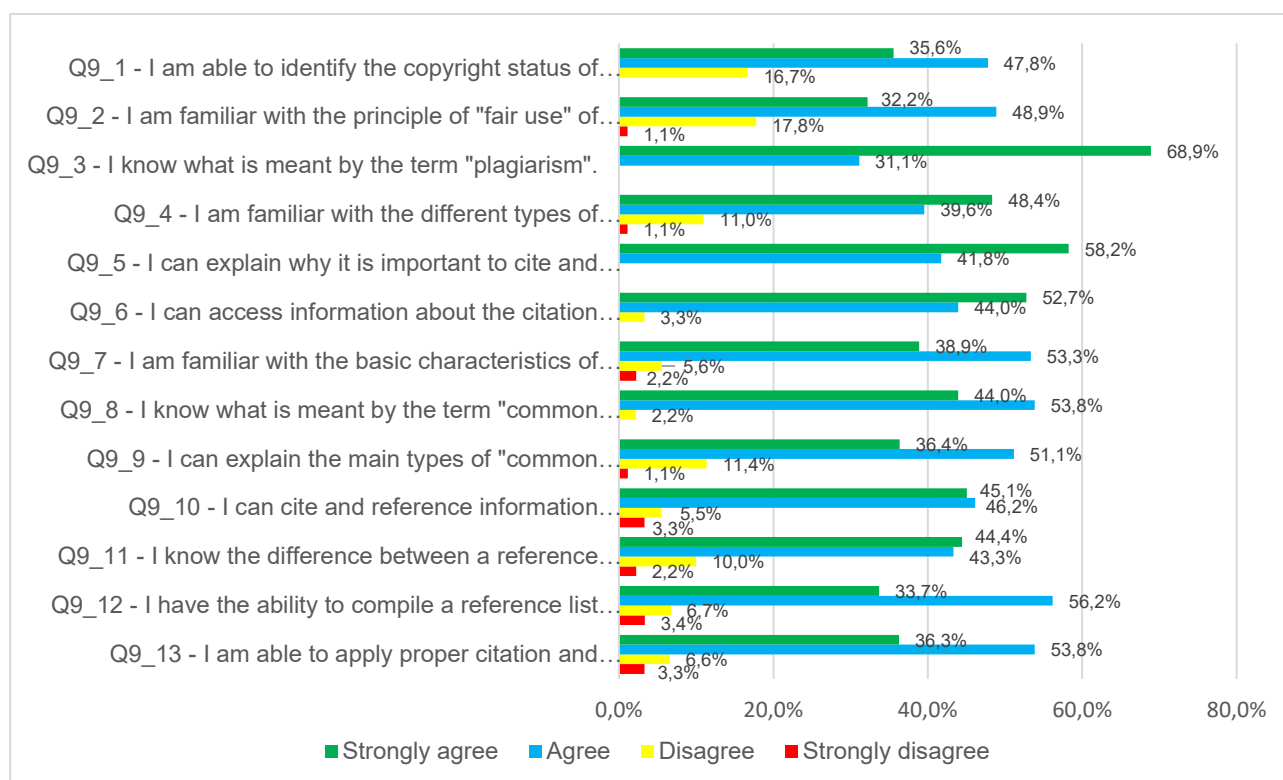
In statement 8_2, 86,5% of the respondents indicated that they strongly agree or agree that they are familiar with the criteria that are commonly used to evaluate information sources. Statements 8_3-8_8 focus on six specific evaluation criteria. The overall percentages of the responses of respondents who strongly agree or agree with statements 8_3-8_8 indicate that the respondents' level of proficiency to determine the authority (71,6%) and writing style (72,7%) of an information source is lower than their level of proficiency to determine the currency, accuracy, purpose and objectivity of an information source. It should be noted that all six criteria are of equal importance to establish the credibility of an information source. A lower level of proficiency to determine the authority and writing style of an information source compromises the ability to determine the credibility or appropriateness of an information source. Statement 8_9 specifically focuses on the ability to apply the evaluation criteria in practice. 72,7% of the respondents indicated that they strongly agree or agree that they can apply the evaluation criteria in practice. The respondents'

level of competency to evaluate sources is negatively affected by their level of proficiency to apply the evaluation criteria in practice.

4.3.2.4 Statements about the information literacy competency to use information in an ethical and legal manner

Question 9 is the third and last question that forms part of Section 3 of the online questionnaire. This question consists of 13 personalised statements that the students had to complete by indicating their level of agreement with each statement. In this question, students were asked to share their perceptions about their ability to use information effectively in an ethical and legal manner. The ability to use information in an ethical and legal manner is the third of the three information literacy competencies that are part of the information literacy module that the students who enrolled in a specific health related programme are required to complete. Figure 4.11 below shows the responses of the respondents.

Figure 4.11 Statements about the competency to use information in an ethical and legal manner



4.3.2.4.1 Identifying the copyright status of an information source

Statement 9_1 is the first statement that forms part of Question 9. This statement focuses on the students' ability to identify the copyright status of an information source. The statement was completed by 90 of the 92 respondents. Figure 4.11 shows that 35,6% of the respondents indicated that they strongly agree that they are able to identify the copyright status of an information source. A further 47,8% of the respondents agree with the statement. 16,7% of the respondents disagree with the statement. A total of 83,3% of the respondents indicated that they are able to identify the copyright status of an information source and 16,7% of the respondents indicated that they are not able to identify the copyright status.

4.3.2.4.2 Familiarity with the principle of "fair use"

Statement 9_2 focuses on students' familiarity with term fair use. In the information literacy module that students in a specific healthcare related programme must complete, the term fair use refers to the limited right that individuals have to use the copyright-protected work of others in specific circumstances without having to pay a fee. The fair use of information is thus a legal concept. Statement 9_2 was completed by 90 respondents. Figure 4.11 illustrates that 32,2% of the respondents indicated that they strongly agree that they are familiar with the concept. 48,9% of the respondents indicated that they agree with the statement. On the other hand, 17,8% of the respondents indicated that they disagree and 1,1% of the respondents indicated that they strongly disagree. 81,1% of the respondents indicated that they are familiar with the term fair use, while 18,9% of the respondents indicated that they are not familiar with the term.

4.3.2.4.3 Knowing what is meant by plagiarism

Statements 9_3 and 9_4 focus on plagiarism. Statement 9_3 deals with the term plagiarism. In the information literacy module, that the students in the specific health related programme are required to complete, the term plagiarism refers to the act of presenting the ideas and work of others as your own without giving them credit. Plagiarism is an ethical concept. 90 respondents completed the statement. The responses of the respondents are captured in Figure 4.11. 68,9% of the respondents indicated that they strongly agree with the statement that they know what is meant by the term plagiarism. 31,1% of the respondents indicated that they agree with the statement. 0,0% of the respondents indicated that they disagree or strongly disagree with the statement. Thus 100,0% of the respondents know what is meant by the term plagiarism.

4.3.2.4.4 Familiarity with different types of plagiarism

Statement 9_4 focuses on different types of plagiarism. The information literacy module, that is offered to students who are enrolled in the specific healthcare related programme, distinguishes between intentional and unintentional plagiarism. Statement 9_4 was completed by 91 respondents. As depicted in Figure 4.11, 48,4% of the respondents indicated that they strongly agree with the statement that they are familiar with different types of plagiarism. A further 39,6% of the respondents indicated that they agree with the statement. 11,0% of the respondents indicated that they disagree with the statement that they are familiar with the different types of plagiarism, while 1,1% of the respondents indicated that they strongly disagree. A total of 87,9% of the respondents indicated that they are familiar with different types of plagiarism, while 12,1% of the respondents indicated that they are not familiar with different types of plagiarism.

4.3.2.4.5 Explaining the importance to cite and reference information sources

The remainder of the statements of Question 9 (i.e. Statements 9_5-9_13) deal with various aspects related to citing and referencing. Statement 9_5 focuses on the importance to cite and reference information sources used in an assignment. This statement was completed by 91 respondents. Figure 4.11 illustrates that 58,2% of the respondents indicated that they agree with the statement that they can explain the importance to cite and reference an information source that is included in an assignment. The remaining 41,8% of the respondents indicated that they agree with the statement. 0,0% of the respondents indicated that they disagree or strongly disagree with the statement. 100% of the respondents indicated that they can explain the importance of citing and referencing information sources included in an assignment.

4.3.2.4.6 Accessing information about citation and referencing styles

Statement 9_6 deals with students' ability to access information about citation and referencing styles that are used in the University of Technology. It should be noted that the University of Technology adopted the practice whereby each academic department of the university decides which citation and referencing styles should be used for citation and referencing purposes. During a lecture, the information literacy lecturers demonstrate to students where they can access authoritative information on the internet regarding commonly used referencing styles. It falls outside the scope of the information literacy module to share comprehensive and detailed

information such as the punctuation and other requirements of all referencing styles with students. Thus, the ability to find additional information about referencing styles is a critical skill that students must have to be competent in using information in an ethical and legal manner. Statement 9_6 was completed by 91 respondents. Figure 4.11 shows that 52,7% of the respondents indicated that they strongly agree with the statement that they can access information about citation and referencing styles. 44,0% of the respondents indicated that they agree with the statement. 3,3% of the respondents indicated that they disagree with the statement. 96,7% of the respondents indicated that they can access additional information about citation and referencing styles, while 3,3% of the respondents indicated that they are unable to access additional information.

4.3.2.4.7 Familiarity with the basic characteristics of the main categories of citation and referencing styles

Statement 9_7 focuses on the basic characteristics of the main categories of citation and referencing styles. The information literacy modules of the University of Technology discuss the basic characteristics of three main categories of citation and referencing styles, namely: Parenthetical styles, Numbered styles and Documentary Note styles. Statement 9_7 was completed by 91 of the 92 respondents. Figure 4.11 depicts that 38,9% of the respondents indicated that they strongly agree with the statement that they are familiar with the basic characteristics of the main categories of citation and referencing styles. 53,3% of the respondents indicated that they agree with the statement, while 5,6% of the respondents indicated that they disagree. 2,2% of the respondents indicated that they strongly disagree. A total of 92,2% of the respondents indicated they are familiar with the basic characteristics of the main categories of citation and referencing styles, while 7,8% indicated that they are not familiar with them.

4.3.2.4.8 Knowing what is meant by the term common knowledge

Statements 9_8 and 9_9 focus on the concept of common knowledge. Statement 9_8 deals with the term common knowledge. In the information literacy module that the students, who are enrolled in the healthcare related programme, must complete, common knowledge refers to information that the average person would know or would accept as reliable and therefore does not require a citation. 90 respondents completed this statement. As shown in Figure 4.11, 44,0% of the respondents indicated that they strongly agree with the statement that they are familiar with the term common knowledge. A further 53,8% of the respondents indicated that they agree with the statement. 2,2% of the respondents indicated that they disagree with the statement. Based on the

data included in Figure 4.11, it can therefore be concluded that 97,8% of the respondents are familiar with the term common knowledge while 2,2% are not.

4.3.2.4.9 Explaining the main types of common knowledge

Statement 9_9 focus on the main types of common knowledge. In the information literacy modules of the University of Technology, three main types of common knowledge are identified, namely: 1) information that everyone or nearly everyone knows, 2) information that is shared by a cultural or national group and 3) information and knowledge that are shared by members of the certain field of study. Statement 9_9 was completed by 88 respondents. Figure 4.11 shows that 36,4% of the respondents indicated that they strongly agree with the statement that they can explain the main types of common knowledge, while 51,1% of the respondents indicated that they agree with the statement. 11,4% of the respondents indicated that they disagree with the statement, while 1,1% of the respondents indicated that they strongly disagree. A total of 87,5 % of the respondents indicated that they can explain the main types of common knowledge. 12,5% of the respondents indicated that they are unable to explain the main types of common knowledge.

4.3.2.4.10 Citing and referencing information sources using the prescribed referencing style

Statement 9_10 focuses on the ability of students to cite and reference information sources that they include in an assignment using the referencing style that is prescribed by their academic department. The statement was completed by 91 of the 92 respondents. Figure 4.11 illustrates that 45,1% of the respondents indicated that they strongly agree with the statement that they can cite and reference information sources included in an assignment using the prescribed referencing style. A further 46,2% of the respondents indicated that they agree with the statement. 5,5% of the respondents indicated that they disagree, while 3,3% of the respondents indicated that they strongly disagree with the statement. 91,2% of the respondents indicated that they can cite and reference information used in an assignment using the referencing style that is prescribed by their department, while 8,8% of the respondents indicated that they cannot perform this function.

4.3.2.4.11 Differentiating between a reference list and a bibliography

Statement 9_11 focuses on the differentiation between a reference list and a bibliography. The statement was completed by 90 of the 92 respondents. As illustrated in Figure 4.11, 44,4% of the respondents indicated that they strongly agree with the statement that they know the difference between a reference list and a bibliography. 43,3% of the respondents indicated that they agree. 6,7% of the respondents indicated that they disagree and 3,4% of the respondents strongly disagree. A total of 87,8% of the respondents indicated that they know the difference between a reference list and a bibliography, while 12,2% of the respondents do not know the difference between a reference list and a bibliography.

4.3.2.4.12 Compiling a reference list and bibliography using the prescribed referencing style

Statement 9_12 deals with the ability of students to compile a reference list and bibliography using the referencing style that is prescribed by their academic department. 89 of the 92 respondents completed the statement. Figure 4.11 shows that 33,7% of the respondents indicated that they strongly agree with the statement that they are able to compile a reference list and a bibliography using the prescribed referencing style. A further 56,2% of the respondents indicated that they agree with the statement, while 6,7% disagree with the statement and 3,4% strongly disagree. It can thus be concluded that 89,9% of the respondents have the ability to compile a reference list and bibliography using the referencing style that is prescribed by their department, while 10,1% of the respondents are not able to compile a reference list and bibliography using the prescribed referencing style.

4.3.2.4.13 Applying proper citation and referencing techniques to correct plagiarism mistakes

Statement 9_13, which is the last statement that forms part of Question 9, focuses on students' ability to apply proper citation and referencing techniques to correct plagiarism mistakes in an assignment. This statement was completed by 91 of the 92 respondents. Figure 4.11 depicts that 36,3% of the respondents indicated that they strongly agree with the statement that they are able to apply proper citation and referencing techniques to correct plagiarism mistakes in an assignment. 53,8% of the respondents indicated that agree with the statement. 6,6% of the respondents indicated that they disagree with the statement and 3,3% of the respondents indicated that they strongly disagree. A total of 90,1% of the respondents are able to apply proper citation and referencing techniques to correct plagiarism mistakes in an assignment. However, 9,9% of the respondents indicated that they are unable to correct plagiarism mistakes.

The overall percentages of responses of respondents who strongly agree and agree with statements 9_1-9_13 are shown in Figure 4.12 below.

Figure 4.12 Overall percentages of responses of respondents who strongly agree and agree with statements 9_1-9_13

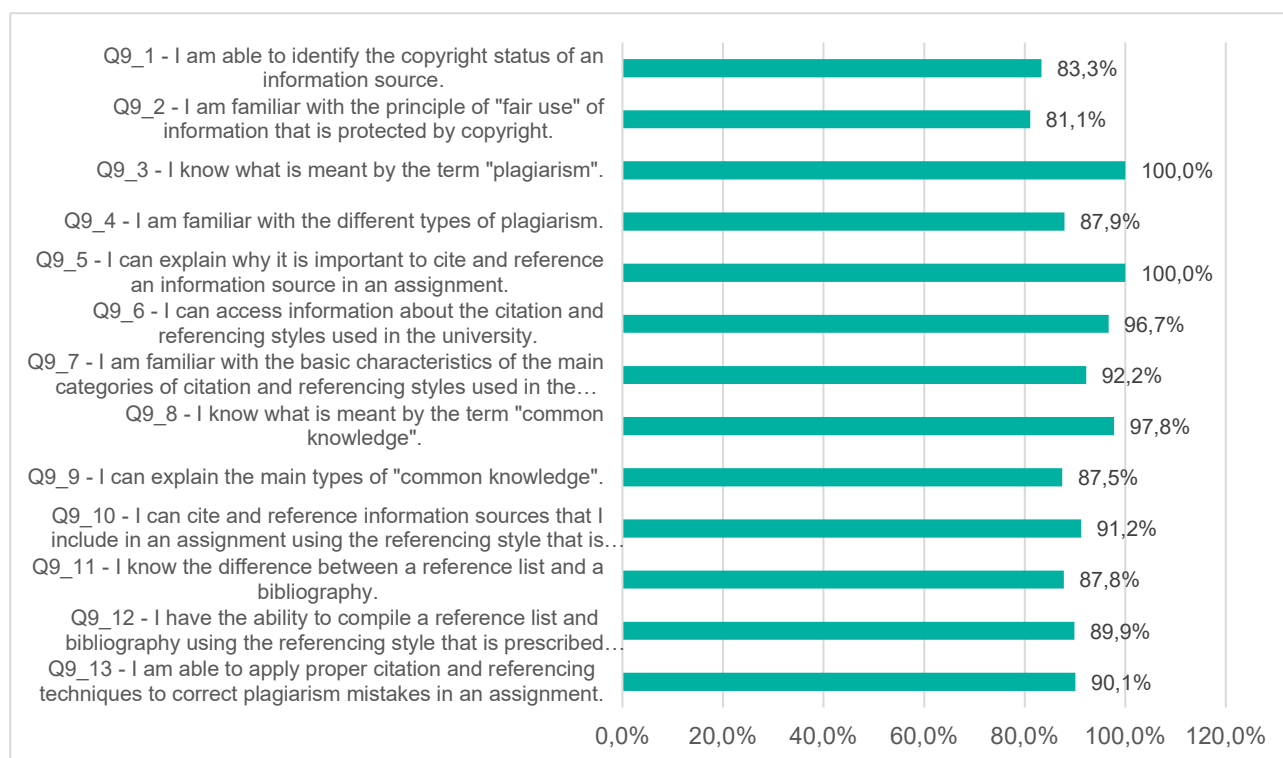


Figure 4.12 shows there is a variation in the responses of respondents who strongly agree and agree when statements 9_1-9_13 are compared with each other. Just like the previous statements, statements 9_1-9_13 are derived from the learning outcomes of the information literacy module that the students in the specific healthcare related programme are required to complete. Statements 9_1-9_13 are specifically related to the information literacy competency to use information in an ethical and legal manner. In statement 9_1 the overall percentage of the responses of respondents who strongly agree or agree is 83,3%, while the overall percentage for statement 9_2 is 81,1%. These percentages indicate that the respondents' level of proficiency to identify the copyright status of an information source and their level of familiarity with the principle of fair use of information that is protected by copyright, negatively affects their overall competence to use information in an ethical and legal manner.

The overall percentages of the responses of respondents who strongly agree and agree with statements 7_1-7_11, 8_1-8_9 and 9_1-9_13 are shown in Figure 4.13 below.

Figure 4.13 Overall percentages of responses for statements 7-9

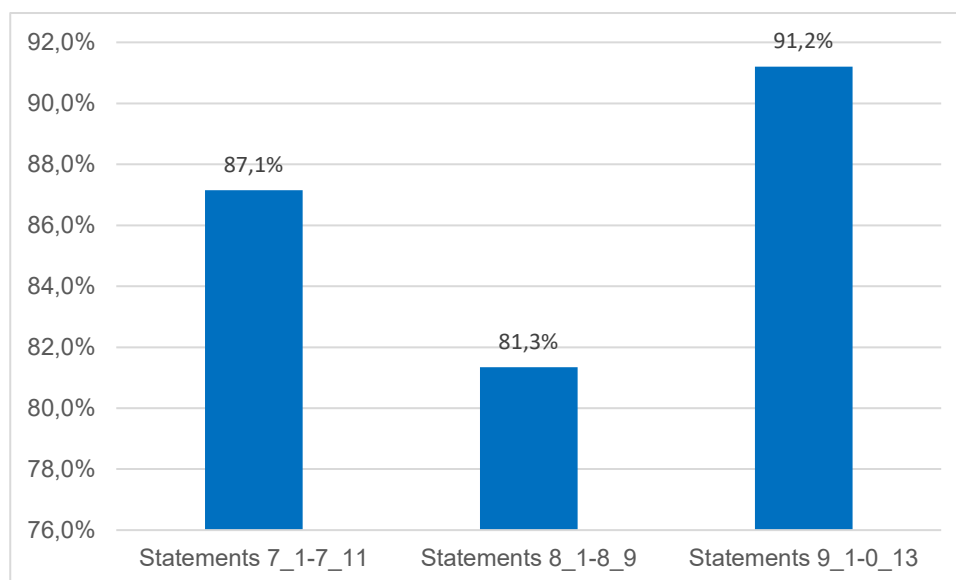


Figure 4.12 shows the overall percentages of responses of respondents who strongly agree and agree with statements 7_1-7_11, 8_1-8_9 and 9_1-9_13. Statements 7_1-7_11 focus on the information literacy competency to locate information sources, statements 8_1-8_9 focus on the information literacy competency to evaluate information sources and statements 9_1-9_13 focus on the information literacy competency to use information in an ethical and legal manner. As depicted in Figure 4.12, there is a difference in the overall percentages of the three listed statement sets. The overall percentage of statements 7_1-7_11 is 87,1%. For statements 8_1-8_9 it is 81,3% and for statements 9_1-9_13 the overall percentage is 91,2%. This indicates that the respondents' level of competence to use information in an ethical and legal manner is higher than the other two competencies. The respondents' level of competence to evaluate information sources is the lowest of the three competencies.

4.3.3 Students' attitudes towards information literacy

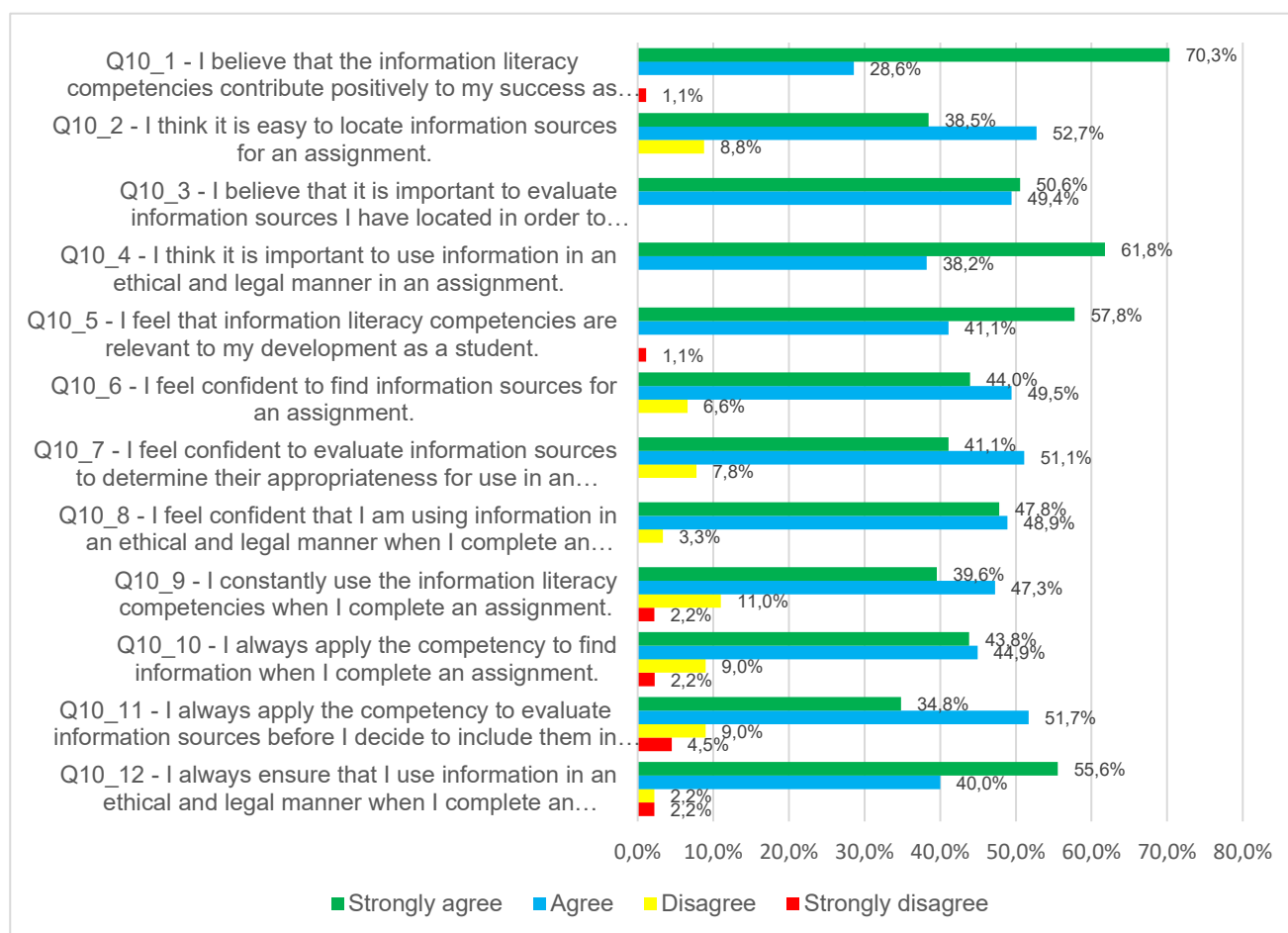
Section 4 of the questionnaire focuses on students' attitudes towards information literacy. This section consists of one question. The question comprises of twelve personalised statements to which students had to indicate their level of agreement of each statement according to a four-point Likert scale ranging between strongly agree, agree, disagree and strongly disagree. Table 4.1 below illustrates the categorisation of the statements that form part of Section 4 of the questionnaire.

Table 4.1 Categorisation of statements about information literacy

	Cognitive component	Affective component	Behavioural component
General aspects of information literacy	Q10_1 - I believe that the information literacy competencies contribute positively to my success as a student.	Q10_5 - I feel that information literacy competencies are relevant to my development as a student.	Q10_9 - I constantly use the information literacy competencies when I complete an assignment.
Information literacy competency to locate information sources	Q10_2 - I think it is easy to locate information sources for an assignment.	Q10_6 - I feel confident to find information sources for an assignment.	Q10_10 - I always apply the competency to find information when I complete an assignment.
Information literacy competency to evaluate information sources that have been located	Q10_3 - I believe that it is important to evaluate information sources I have located in order to establish their credibility for use in an assignment.	Q10_7 - I feel confident to evaluate information sources to determine their appropriateness for use in an assignment.	Q10_11 - I always apply the competency to evaluate information sources before I decide to include them in an assignment.
Information literacy competency to use information in an ethical and legal manner	Q10_4 - I think it is important to use information in an ethical and legal manner in an assignment.	Q10_8 - I feel confident that I am using information in an ethical and legal manner when I complete an assignment.	Q10_12 - I always ensure that I use information in an ethical and legal manner when I complete an assignment.

Statements 10_1-10_4 consist of a cognitive component, statements 10_5-10_8 consist of an affective component and statements 10_9-10_12 consist of a behavioural component. Statements 10_1, 10_5 and 10_9 focus on general aspects of information literacy. Statements 10_2, 10_6 and 10_10 focus on the information literacy competency to locate information sources. Statements 10_3, 10_7 and 10_11 focus on the information literacy competency to evaluate located information sources and statements 10_4, 10_8 and 10_12 focus on the information literacy competency to use information in an ethical and legal manner. Percentages of the responses of respondents are included in Figure 4.14 below.

Figure 4.14 Level of agreement of statements related to respondents' attitudes towards information literacy



4.3.3.1 Cognitive component of attitudes towards information literacy

Statements 10_1-10_4 focus on the cognitive component of attitudes toward information literacy. As illustrated in Table 4.1 these statements focus on different aspects of information literacy.

4.3.3.1.1 Belief that information literacy competencies contribute to student success

Statement 10_1 deals with students' belief that the information literacy competencies contribute positively to their success as students. This statement was completed by 91 of the 92 respondents. Figure 4.14 shows that 70,3% of the respondents indicated that they strongly agree with the statement that the information literacy competencies contribute positively towards their success as students. A further 28,6% of the respondents indicated that they agree with the statement. 0,0% of the respondents indicated that they disagree, while 1,1% of the respondents

indicated that they strongly disagree. It can thus be concluded that 98,9% of the respondents hold the belief that the information literacy competencies contribute to their success as students. The remaining 1,1% of the respondents, in contrast, do not believe that the information literacy competencies contribute towards student success.

4.3.3.1.2 Belief that it is easy to locate information sources for an assignment

Statement 10_2 focuses on students' belief that it is easy to locate information sources for an assignment. This statement was completed by 91 respondents. As illustrated in Figure 4.14, 38,5% of the respondents indicated that they strongly agree with the belief that it is easy to locate information sources for an assignment, while 52,7% of the respondents indicated that they agree with the statement. However, 8,8% of the students indicated that they disagree with the statement. 91,2 % of the respondents indicated that they believe it is easy to locate information sources for an assignment while the remaining 8,8% of the students indicated that they believe that it is not easy to locate information sources for an assignment.

4.3.3.1.3 Belief that it is important to evaluate information sources to establish its credibility for use in an assignment

Statement 10_3 relates to the belief that it is important to evaluate located information sources for use in an assignment. This statement was completed by 89 of the 91 respondents. 50,6% of the respondents indicated that they strongly agree with the statement that it is important to evaluate located information sources for use in an assignment, while a further 49,4% of the respondents indicated that they agree with the statement. 0,0% of the respondents indicated that they disagree with the statement and 0,0% of the respondents indicated that they strongly disagree. All 100,0% of the respondents hold the belief that it is important to evaluate information sources that are included in an assignment.

4.3.3.1.4 Belief that it is important to use information in an ethical and legal manner in an assignment

Statement 10_4 deals with the belief that it is important to use information included in an assignment in an ethical and legal manner. This statement was completed by 89 respondents. As depicted in Figure 4.14, 61,8% of the respondents indicated that they strongly agree with the belief that it is important to use information included in an assignment in an ethical and legal manner.

38,8% of the respondents indicated that they agree with the statement. 0,0% of the respondents indicated that they disagree or strongly disagree with the statement. Thus 100% of the respondents hold the belief that it is important to use information included in an assignment in an ethical and legal manner.

4.3.3.2 Affective component of attitudes towards information literacy

Statements 10_5-10_8 focus on the affective component of attitudes towards information literacy. As illustrated in Table 4.1, these four statements focus on different aspects of information literacy.

4.3.3.2.1 Feeling that information literacy competencies are relevant to student development

Statement 10_5 deals with students' feelings towards the contribution of information literacy competencies to their development as students. This statement was completed by 90 of the 92 respondents. Figure 4.14 illustrates that 57,8% of the respondents indicated that they strongly agree with the feeling that the information literacy competencies are relevant to their development as students. 41,1% of the respondents indicated that they agree with the statement. 0,0% of the respondents indicated that they disagree with the statement and 1,1% of the respondents indicated that they strongly disagree. 98,9% of the respondents feel that the information literacy competencies are relevant to their development as students, while 1,1% of the respondents indicated that they feel that the information literacy competencies are not relevant to their development as students.

4.3.3.2.2 Feeling of confidence to find information for an assignment

Statement 10_6 relates to students' feelings of confidence to find information sources for use in an assignment. 91 respondents completed this statement. As shown in Figure 4.14, 44,0% of the respondents indicated that they strongly agree with the statement that they feel confident to find information for an assignment. 49,5% of the respondents indicated that they agree with the statement. On the other hand, 6,6% of the respondents indicated that they disagree with the statement. 0,0 % of the respondents indicated that they strongly disagree with the statement. 93,4% of the respondents indicated that they feel confident to find information for an assignment, while 6,6% of the respondents do not feel confident to find information for an assignment.

4.3.3.2.3 Feeling of confidence to evaluate information sources to determine their appropriateness for use in an assignment

Statement 10_7 focuses on students' feelings of confidence to evaluate information sources in order to determine their appropriateness for use in an assignment. This statement was completed by 90 of the 92 respondents. Figure 4.14 illustrates that 41,1% of the respondents indicated that they strongly agree with the statement that they feel confident to evaluate information sources to determine their appropriateness for use in an assignment. 51,1% of the respondents indicated that they agree with the statement. However, 7,8% of the respondents indicated that they disagree with the statement. 0,0% of the respondents indicated that they strongly agree. 92,2% of the respondents feel confident to evaluate information sources to establish their appropriateness for use in an assignment, while 7,8% of the respondents indicated that they do not feel confident to perform this activity.

4.3.3.2.4 Feeling of confidence to use information in an ethical and legal manner in an assignment

Statement 10_8 deals with students' feeling of confidence to use information in an ethical and legal manner when completing an assignment. The statement was completed by 90 respondents. Figure 4.14 shows that 47,8% of the respondents indicated that they strongly agree with the statement that they feel confident to use information in an ethical and legal manner when completing an assignment. A further 48,9% of the respondents indicated that they agree with the statement. 3,3% of the respondents indicated that they do not agree with the statement, while 0,0% of the respondents indicated that they strongly disagree. It can thus be concluded that 96,7% of the respondents indicated that they feel confident to use information in an ethical and legal manner when completing an assignment. On the other hand, 3,3% of the respondents indicated that they do not feel confident to use information in an ethical and legal manner.

4.3.3.3 Behavioural component of attitudes towards information literacy

Statements 10_9-10_12 deal with students' behavioural component of their attitudes towards information literacy in general, including the three information literacy competencies that form part of the information literacy module, which is the focus of this research study. The specific focus of each statement is illustrated in Table 4.1.

4.3.3.3.1 Using information literacy competencies when completing an assignment

Statement 10_9 focuses on students' behaviour in using the information literacy competencies. This statement was completed by 91 of the 92 respondents. As depicted in Figure 4.14, 39,6% of the respondents indicated that they strongly agree with the statement that they constantly use the information literacy competencies when completing an assignment. A further 47,3% of the respondents agree with the statement. However, 11,0% of the respondents indicated that they disagree with the statement that they constantly use the information literacy competencies. 2,2% of the respondents indicated that they strongly disagree with the statement. A total of 86,8% of the respondents indicated that they constantly use the information literacy competencies when completing an assignment, while 13,2% of the respondents indicated that they do not constantly use the information literacy competencies when completing an assignment.

4.3.3.3.2 Applying the information literacy competency to find information sources when completing an assignment

Statement 10_10 deals with students' behaviour towards the information literacy competency to find information when completing an assignment. This statement was completed by 89 of the 92 respondents. Figure 4.14 shows that 43,8% of the respondents indicated that they strongly agree with the statement that they always apply the information literacy competency to find information when completing an assignment. 44,9% of the respondents indicated that they agree with the statement. 9,0% of the respondents indicated that they disagree with the statement, while 2,2% of the respondents indicated that they strongly disagree with the statement. 88,8% of the respondents indicated that they constantly use the information literacy competency to find information when completing an assignment. 11,2% of the respondents indicated that they do not constantly use the competency to find information when completing an assignment.

4.3.3.3.3 Applying the information literacy competency to evaluate information sources when completing an assignment

Statement 10_11 relates to students' behaviour towards the information literacy competency to evaluate information sources in order to determine their appropriateness for inclusion in an assignment. Statement 10_11 was completed by 89 of the 92 respondents. As depicted in Figure 4.14, 34,8% of the respondents indicated that they strongly agree with the statement that they always apply the information literacy competency to evaluate information sources before deciding to include them in an assignment. A further 51,7% of the respondents indicated that they agree

with the statement, while 9,0% of the respondents indicated that they disagree with the statement. 4,5% of the respondents indicated that they strongly disagree. It can be concluded that 86,5% of the respondents always apply the information literacy competency to evaluate information sources before deciding to include them in an assignment, while 13,5% of the respondents do not always apply the competency.

4.3.3.2.4 Applying the information literacy competency to use information in an ethical and legal manner when completing an assignment

The last statement of the questionnaire, which is statement 10_12, focuses on students' behaviour towards the information literacy competency to use information in an ethical and legal manner. The statement was completed by 90 of the 92 respondents. Figure 4.14 shows that 55,6% of the respondents indicated that they strongly agree with the statement that they always ensure that they use information in an ethical and legal manner when completing an assignment. 40,0% of the respondents indicated that they agree with the statement. On the other hand, 2,2% of the respondents indicated that they disagree with the statement. 2,2% of the respondents indicated that they strongly disagree with the statement. 95,6% of the respondents indicated that they always ensure that they use information in an ethical and legal manner when completing an assignment and 4,4% of the respondents indicated that they do not always ensure that they use information in an ethical and legal manner when completing an assignment.

The overall percentages of responses of respondents who strongly agree and agree with statements 10_1-10_12 are shown in Figure 4.15 below.

Figure 4.15 Overall percentages of responses of respondents who strongly agree and agree with statements 10_1-10_12

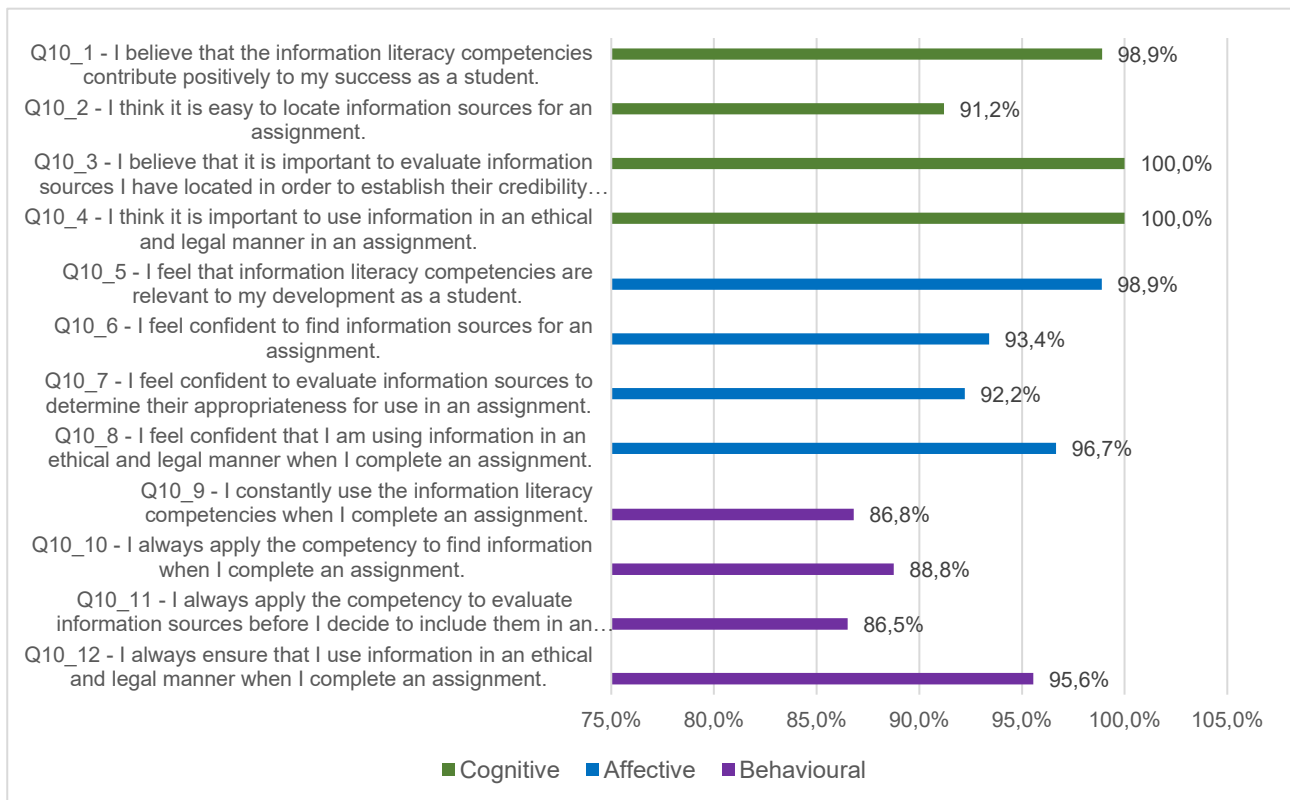


Figure 4.15 shows the overall percentage of responses of respondents who strongly agree and agree with statements 10_1-10_12. Statements 10_1-10_4 focus on the cognitive component of students' attitudes. Statements 10_5-10_8 focus on the affective component and statements 10_9-10_12 focus on the behavioural component of students' attitudes. As depicted in Figure 4.15, there is a difference in the responses of respondents who strongly agree and agree related to the cognitive, affective and behavioural components. With 91,2%, statement 10_2 was the lowest of the four statements related to the cognitive component of the respondents' attitudes towards information literacy. This indicates that the level of the respondents' cognitive ability to locate information sources has a negative impact on the respondents' cognitive component of their attitudes towards information literacy. With 92,2%, statement 10_7 was the lowest of the four statements related to the affective component of the respondents' attitudes towards information literacy. This indicates that the respondents' feelings of confidence about the competency to evaluate information sources negatively influence their attitudes towards information literacy. With 86,5%, statement 10_11 was the lowest of the four statements related to the behavioural component of the respondents' attitudes towards information literacy. With 86,8%, statement 10_9 was the second lowest of the four statements. This indicates that the respondents' behaviour to evaluate information sources contributes negatively to their attitudes towards information literacy.

The overall percentages of cognitive-, affective- and behavioural related statements are illustrated in Figure 4.16 below.

Figure 4.16 Overall percentages of cognitive-, affective- and behavioural related statements

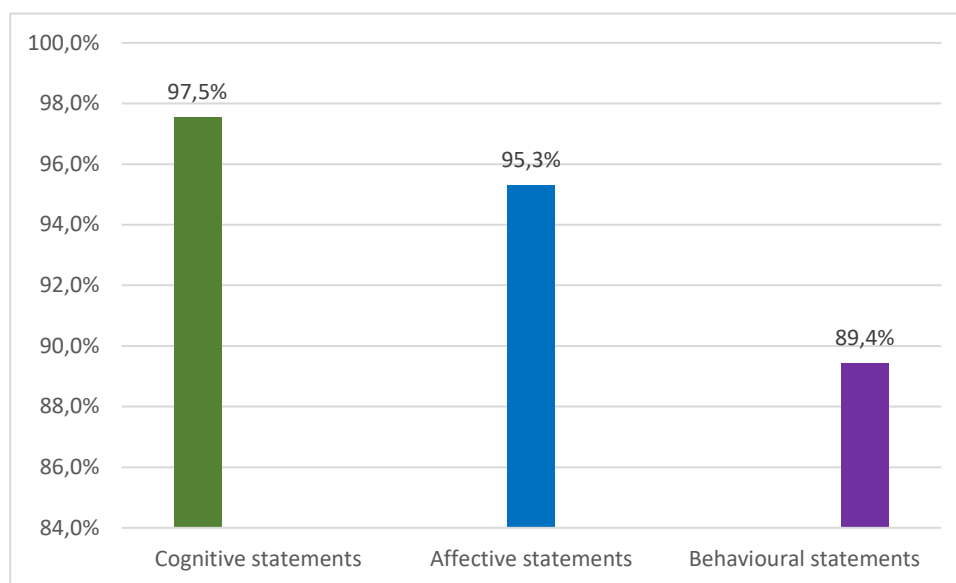


Figure 4.16 shows the overall percentages of responses of respondents who strongly and agree with statements 10_1-10_12. With 97,5%, the overall percentage of statements that focus on the cognitive component of attitudes was the highest. With 89,4%, the overall percentage of statements that deal with the behavioural component of attitudes was the lowest. It is, therefore, concluded that the behavioural component of attitudes has a negative impact on the attitudes of respondents when compared to the cognitive component and the affective component of attitudes.

The overall percentages of statements related to specific information literacy competencies are shown in Figure 4.17 below.

Figure 4.17 Overall percentages of statements related to specific information literacy competencies

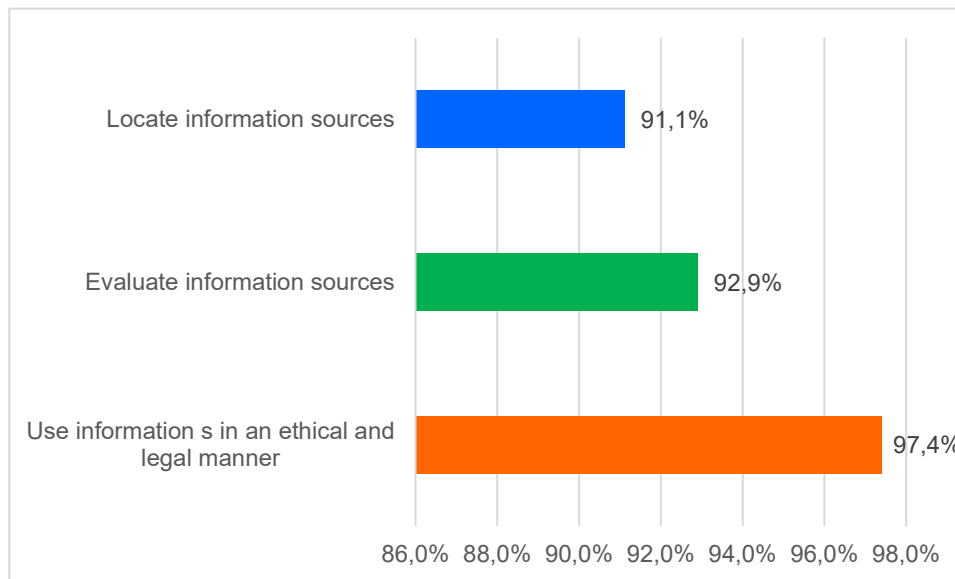


Figure 4.17 shows the overall percentages of responses of respondents who strongly agree and agree with statements 10_1-10_12. The overall percentage related to the information literacy competency to locate information sources is derived from statements 10_2, 10_6 and 10_10. The overall percentage related to the information literacy competency to evaluate information sources to determine their credibility for use is derived from statements 10_3, 10_7 and 10_11 and the overall percentage that is related to the information literacy competency to use information in an ethical and legal manner is derived from statements 10_4, 10_8 and 10_12. As illustrated in Figure 4.17, the overall percentage of attitudinal statements related to the information literacy competency to use information in an ethical and legal manner is the highest with 97,4%, while the overall percentage of attitudinal statements related to the information literacy competency to locate information sources is the lowest with 91,1%. The difference between the lowest and second lowest overall percentage is 1,8%, while the difference between the highest and second highest overall percentage is 4,5%. The attitudes related to information literacy competencies to locate and to evaluate information sources have a negative impact on the respondents' overall attitudes towards information literacy when compared to the respondents' attitudes towards the competency to use information in an ethical and legal manner.

4.3.3.4 Correlation between cognitive-, affective- and behavioural components of attitudes towards information literacy

Pearson's product momentum correlation coefficient was used to determine the relationship between the cognitive-, affective- and behavioural components of attitudes towards information literacy. According to Fernando (2024) correlation coefficients are used to assess the degree of association between two variables. Turney (2022) mentions that the Pearson correlation coefficient is the most common way of measuring a linear correlation. It is expressed as a number between -1 and 1. A number between 0 and 1 indicates that there is a positive correlation between the variables. The Pearson correlation coefficient is an appropriate inferential statistical tool to test if there is a significant relationship between variables (Bhandari, 2020). Anglim (2017) states that studies have indicated that the majority of bivariate relationships between multiple item Likert scales are analysed using the Pearson correlation coefficient. A two-tailed test was used to test for statistical significance. According to Hayes (2024) a two-tailed test is a method in which the area of distribution is two-sided and is used in null hypothesis testing and testing for statistical significance.

Table 4.2 below focuses on the correlation between the cognitive-, affective- and behavioural components of attitudes towards information literacy.

Table 4.2 Correlation between cognitive-, affective- and behavioural components of attitudes towards information literacy

		Q10_1_Q10_4	Q10_5_Q10_8	Q10_9_Q10_12
Q10_1_Q10_4	Pearson Correlation	1	0,771	0,748
	Sig. (2-tailed)		<,001	<,001
	N	88	87	85
Q10_5_Q10_8	Pearson Correlation	0,771	1	0,815
	Sig. (2-tailed)	<0,001		<0,001
	N	87	89	86
Q10_9_Q10_12	Pearson Correlation	0,748	0,815	1
	Sig. (2-tailed)	<0,001	<0,001	
	N	85	86	86

In Table 4.2. the cognitive-, affective- and behavioural components of attitudes towards information literacy have been correlated using the Pearson correlation coefficient. Cognitive related statements comprise of statements 10_1-10_4, affective related statements comprise of statements 10_5-10_8 and behavioural related statements comprise of statements 10_9-10_12.

Table 4.2 indicates that the degree in correlation between statements 10_1-10_4 and 10_5-10_8 is 0,771, while the degree in correlation between statements 10_1-10_4 and 10_9-10_12 is 0,748. The degree in correlation between statements 10_5-10_8 and 10_9-10_12 is 0,815. The table also indicates that the data is significant at the 0,01 level (2-tailed). Beers (2024) indicates that a p-value of 0,05 or lower is generally considered statistically significant. The data in Table 4.2 indicates that, statistically, there is a significant correlation between statements 10_1-10_4, 10_5-10_8 and 10_9-10_12. This means that the respondents' attitudes towards information literacy are indeed informed by cognitive-, affective- and behavioural components. All three these components contribute to their attitudes towards information literacy.

4.3.4 Correlation between the respondents' use of information literacy competencies and their attitudes towards information literacy

4.3.4.1 Overall correlation between the respondents' use of information literacy competencies and their attitudes towards information literacy

Pearson's product momentum correlation coefficient was used to examine the overall degree in correlation between the respondents' use of information literacy competencies and their attitudes towards information literacy. A two-tailed test was used to test for statistical significance. Table 4.3 below focuses on the correlation between the respondents' use of information literacy competencies and their attitudes towards information literacy.

Table 4.3 Correlation between the respondents' use of information literacy competencies and their attitudes towards information literacy

		Q6_1-6_6	Q7_1-7_11	Q8_1-8_9	Q9_1-9_13	Q10_1-10_12
Q6_1_Q6_6	Pearson Correlation	1	0,648	0,535	0,594	0,581
	Sig. (2-tailed)		<0,001	<0,001	<,001	<0,001
	N	88	82	81	79	82
Q7_1_Q7_11	Pearson Correlation	0,648	1	0,724	0,619	0,451
	Sig. (2-tailed)	<0,001		<0,001	<,001	<0,001
	N	82	85	79	77	78
Q8_1_Q8_9	Pearson Correlation	0,535	0,724	1	0,532	0,369
	Sig. (2-tailed)	<0,001	<0,001		<,001	<0,001
	N	81	79	85	77	79
Q9_1_Q9_13	Pearson Correlation	0,594	0,619	0,532	1	0,602
	Sig. (2-tailed)	<0,001	<,001	<0,001		<0,001
	N	79	77	77	82	78

Q10_1-Q10_12	Pearson Correlation	0,581	0,451	0,369	0,602	1
	Sig. (2-tailed)	<0,001	<,001	<0,001	<0,001	
	N	82	78	79	78	85

Table 4.3 shows that the degree in correlation between statements 6_1-6_6 and statements 7_1-7_11 is 0,648, while the degree in correlation between statements 6_1-6_6 and statements 8_1-8_9 is 0,535. The degree in correlation between statements 6_1-6_6 and 9_1-9_13 is 0,594 and the degree in correlation between 6_1-6_6 and 10_1-10_12 is 0,581. The degree in correlation between statements 7_1-7_11 and statements 8_1 and 8_9 is 0,724. The degree in correlation between statements 7_1-7_11 and statements 9_1-9_13 is 0,619, while the degree in correlation between statements 7_1-7_11 and statements 10_1-10_12 is 0,451. The degree in correlation between statements 8_1-8_9 and statements 9_1-9_13 is 0,532 and the degree in correlation between statements 8_1-8_9 and statements 10_1-10_12 is 0,369. The degree in correlation between statements 9_1-9_11 and statements 10_1-10_12 is 0,602. Table 4.3 thus shows that all the data is significant at the 0,01 level (2-tailed). There is a significant correlation between statements 6_1-6_6, 7_1-7_11, 8_1-8_9, 9_1-9_13 and 10_1-10_12. This means there is a significant correlation between the respondents' use of information literacy competencies and their attitudes towards information literacy.

4.3.4.2 Correlation between the respondents' use of the information literacy competency to locate information sources and their attitudes towards the competency to locate information sources

The mechanism to assess the degree in correlation between the respondents' use of the competency to locate information sources and their attitudes towards the competency to locate information sources was Pearson's product momentum correlation coefficient. A two-tailed test was used to test for statistical significance. The results of the correlation are depicted in Table 4.4 below.

Table 4.4 Correlation between the respondents' use of the competency to locate information sources and their attitudes towards the competency to locate information sources

		Q7_1-Q7_11	Q10_2-Q10_6-Q10_10
Q7_1-Q7_11	Pearson Correlation	1	0,382
	Sig. (2-tailed)		<0,001
	N	85	82
Q10_2-Q10_6-Q10_10	Pearson Correlation	0,382	1
	Sig. (2-tailed)	<0,001	

	N	82	89
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Statements 7_1-7_11 represent the respondents' use of the information literacy competency to locate information sources. As indicated in Table 4.1, statements 10_2, 10_6 and 10_10 represent the respondents' attitudes towards the information literacy competency to locate information sources. Table 4.4 illustrates that the degree in correlation between statements 7_1-7_11 and statements 10_2, 10_6 and 10_10 is 0,382. The data is significant at the 0,01 level (2-tailed). This means that, statistically, there is a significant correlation between the respondents' use of the information literacy competency to locate information sources and their attitudes towards the competency to locate information sources.

4.3.4.3 Correlation between the respondents' information literacy competency to evaluate information sources and their attitudes towards the competency to evaluate information sources.

Pearson's product momentum correlation coefficient was used to examine the degree in correlation between the respondents' use of the information literacy competency to evaluate information sources and their attitudes towards the competency to evaluate information sources. A two-tailed test was used to test for statistical significance. Table 4.5 below focuses on the correlation mentioned above.

Table 4.5 Correlation between the respondents' use of the competency to evaluate information sources and their attitudes towards the competency to evaluate information sources

		Q8_1_Q8_9	Q10_3_Q10_7_Q10_11
Q8_1_Q8_9	Pearson Correlation	1	0,394
	Sig. (2-tailed)		<0,001
	N	85	81
Q10_3_Q10_7_Q10_11	Pearson Correlation	0,394	1
	Sig. (2-tailed)	<0,001	
	N	81	87

The use of the information literacy competency to evaluate information sources is represented by statements 8_1-8_9. As indicated in Table 4.1, statements 10_3, 10_7 and 10_11 represent the respondents' attitudes towards the information literacy competency to evaluate information sources. Table 4.5 shows that the degree in correlation between statements 8_1-8_9 and statements 10_3, 10_7 and 10_11 is 0,394. The data is significant at the 0,01 level (2-tailed). This means that, statistically, there is a significant correlation between the respondents' use of the

information literacy competency to evaluate information sources and their attitudes towards the competency to evaluate information sources.

4.3.4.4 Correlation between the respondents' use of the information literacy competency to use information in an ethical and legal manner and their attitudes towards the competency to use information ethically and legally

Pearson's product momentum correlation coefficient was used to examine the degree in correlation between the respondents' use of the information literacy competency to evaluate information sources and their attitudes towards the competency to evaluate information sources. A two-tailed test was used to test for statistical significance. Table 4.6 below focuses on the correlation between the use of the attitudes towards the information literacy competency mentioned above.

Table 4.6 Correlation between the respondents' use of the information literacy competency to use information in an ethical and legal manner and their attitudes towards the competency to use information in an ethical and legal manner.

		Q9_1_Q9_13	Q10_4_Q10_8_Q10_12
Q9_1_Q9_13	Pearson Correlation	1	0,502**
	Sig. (2-tailed)		<0,001
	N	82	79
Q10_4_Q10_8_Q10_12	Pearson Correlation	0,502**	1
	Sig. (2-tailed)	<0,001	
	N	79	88

The use of the information literacy competency to use information in an ethical and legal manner is represented by statements 9_1-9_13. Table 4.1 shows that statements 10_4, 10_8 and 10_12 represent the respondents' attitudes towards the information literacy competency to use information in an ethical and legal manner. Table 4.5 depicts that the degree in correlation between statements 9_1-9_13 and statements 10_4, 10_8 and 10_12 is 0,502. The data is significant at the 0,01 level (2-tailed). This means that, statistically, there is a significant correlation between the respondents' use of the information literacy competency to use information in an ethical and legal manner and their attitudes towards the competency to use information in an ethical and legal manner.

4.3.5 Difference between the demographic groupings and the respondents' use of information literacy competencies and their attitudes towards information literacy

Questions 3, 4 and 5 of the survey that the respondents completed, focused on the demographic groupings of the students who are part of the target population of the study. Question 3 focused on the students' current level of study, Question 4 focused on the students' age listed per category and Question 5 focused on the type of information literacy training that the students received.

Analysis of variance (ANOVA) was used to test if there is a difference between the demographic groupings of the respondents and their use of information literacy competencies and their attitudes towards information literacy. Bevans (2020) mentions that analysis of variance is a statistical test that is used to analyse the differences between groups of variables. According to Mackenzie (2018) there are two main types of analysis of variance that are commonly used, namely: one-way ANOVA and two-way ANOVA. Mackenzie (2018) mentions that a one-way ANOVA is a type of statistical test that compares the variance in the sample group means while considering only one independent variable – a two-way ANOVA tests the effect of two factors on a dependent variable.

4.3.5.1 Difference between the respondents' study levels and their use of information literacy competencies

A one-way analysis of variance was used to test whether there is a significant difference between the mean scores of the respondents' current study levels and their use of information literacy competencies. The respondents' use of information literacy competencies is represented by statements 6_1-6_6, 7_1-7_11, 8_1-8_9 and 9_1-9_13. The study levels range between first year, second year, third year and fourth year as reflected in Figure 4.2. Table 4.7 below shows the analysis of variance between the mentioned variables.

Table 4.7 Analysis of variance of the respondents' study level and statements 6_1-9_13.

	Sum of Squares	Degrees of Freedom	Mean Square	F-statistic	P-value
Between Groups	897,7	3	299,2	1,2	0,314
Within Groups	16369,7	66	248,0		
Total	17267,4	69			

Table 4.7 shows that the F-statistic, which is a ratio of between-group variation to within-group variation is 1,2. The probability (p) value is 0,314. The p value is not less than 0,05 and therefore the difference is not statistically significant. It can therefore be concluded that there is no

significant difference between the respondents' current study levels and their use of information literacy competencies.

4.3.5.2 Difference between the respondents' study levels and their attitudes towards information literacy

The one-way analysis of variance was used to determine whether there is a significant difference between the mean scores of the respondents' current study levels and their attitudes towards information literacy. The study levels range from level one to level four as seen in Figure 4.2. The respondents' attitudes towards information literacy are represented by statements 10_1-10_12. Table 4.8 below illustrates the analysis of variance between the variables listed above.

Table 4.8 Analysis of variance between the respondents' study levels and statements 10_1-10_12

ANOVA					
	Sum of Squares	Degrees of Freedom	Mean Square	F-statistic	P-value
Between Groups	270,9	3	90,3	3,8	0,028
Within Groups	2284,1	81	28,2		
Total	2555,0	84			
Descriptives					
Current study level	Number of respondents		Mean	Standard Deviation	
Frist year	23		41,7	5,2	
Second year	16		39,8	5,8	
Third year	29		42,9	5,2	
Fourth year	17		38,2	5,3	
Compensation score results using Tukey-Kramer method					
Pairs I,J		Mean Difference (I-J)	95% Confidence Interval		P-value
			Lower limit	Upper Limit	
First year vs Second year		1,9	-2,6	6,4	0,690
Frist year vs Third year		-1,2	-5,1	2,7	0,847
First year vs Fourth year		3,5	-1,0	7,9	0,180
Second year vs Third year		-3,1	-7,5	1,2	0,244
Second year vs Fourth year		1,6	-3,3	6,4	0,830
Third year vs Fourth year		4,7	0,4	8,9	0,025
Levene test					
		Levene Statistic	Degree of Freedom 1	Degree of Freedom 2	P-value

Based on Mean	0,1	3	81	0,952
Based on Median	0,3	3	81	0,992
Based on Median and with adjusted Degree of Freedom	0,3	3	76,8	0,992
Based on Trimmed mean	0,1	3	81	0,957

Table 4.8 illustrates that the F-statistic is 3,8. The probability value is 0,028. Because the probability value is less than 0,05, the difference is statistically significant. It can therefore be concluded that there is a significant difference between the respondents' study levels and their attitudes towards information literacy.

Unfortunately, the one-way analysis of variance does not show which groups differed from each other. By performing the Tukey-Kramer post hoc test this information can be found in the Multiple Comparisons Table. Lee and Lee (2018) mention that multiple comparisons tests are performed when certain experimental conditions have a statistically significant mean difference or there is a specific aspect between the mean groups. Lee and Lee (2018) report that there are several methods for performing multiple comparisons tests such as the Tukey method, the Newman-Keuls method, the Bonferroni method, the Dunnett method and the Scheffe test. The Tukey-Kramer method is used in this instance, because it is the most commonly used post hoc test that compares the mean between each pairwise combination of groups (Bobbit, 2020). Frost (no date) mentions that the Tukey-Kramer method is specifically used when the sample sizes are unequal and the estimated standard deviation for the different pairwise comparisons has to be calculated.

Table 4.8 shows that the mean score of the respondents on a third-year level is 42,9 (standard deviation = 5,2). This is significantly higher than the mean score of the respondents on a fourth-year level, which is 38,2 (standard deviation = 5,3). Table 4.8 also indicates that the Tukey-Kramer method reveals that the p-value of the pairing for the third- versus fourth-year respondents is 0,025. Because the p-value is less than 0,05, it means that the pairing for the third- versus fourth-year respondents is significantly different from the other pairings.

Zhou, Zhu and Wong (2023) emphasise that variance homogeneity is frequently a key assumption for testing equality of means across groups. Zhou, Zhu and Wong (2023) also report that multiple statistical methods exist to compare variances, such as the F-test, the Ansari-Bradley test, the Moses Ranked-liked test, the Jackknife test, the Levene test, Barlett's test and others. Schenkelberg (no date) emphasises that the Levene test is used when data is not normally distributed. This test is very stable against violations for the normal distribution. It is for this reason that the Levene test for variance homogeneity was used to determine whether the variance in scores was equal for each of the four independent groups. Table 4.8 illustrates that significance values for the Levene test were greater than 0.05, indicating that the homogeneity of variance assumptions was not violated.

It can therefore be concluded that the significant difference between the respondents' study levels and the respondents' attitudes towards information literacy is attributed to the responses of respondents who are in their third year of study when compared to respondents who are in their fourth year of study.

4.3.5.3 Difference between the respondents' age categories and their use of information literacy competencies

The one-way analysis of variance was used to determine whether there is a significant difference between the mean scores of the respondents' age categories and their use of information literacy competencies. The age categories are as listed in Figure 4.3. The respondents' use of information literacy competencies is represented by statements 6_1-9_13. Table 4.9 illustrates the analysis of variance between the variables mentioned above.

Table 4.9 Analysis of variance between the respondents' age categories and statements 6_1-9_13

	Sum of Squares	Degrees of Freedom	Mean Square	F-statistic	P-value
Between Groups	930,3	6	155,0	0,6	0,731
Within Groups	16337,2	63	259,3		
Total	17267,4	69			

Table 4.9 shows that the F-statistic is 0,598 and the resulting p-value is 0,731. The p-value is not less than 0,05 and thus the difference is not statistically significant. It can therefore be concluded that there is no significant difference between the respondents' age categories and the respondents' use of information literacy competencies.

4.3.5.4 Difference between the respondents' age categories and their attitudes towards information literacy

The one-way analysis of variance was used to assess if there is a significant difference between the respondents' age categories and their attitudes towards information literacy. The respondents' age categories are as reflected in Figure 4.3, while their attitudes are represented by statements 10_1-10_12. Table 4.10 below shows the analysis of variance between the respondents' age categories and their attitudes towards information literacy.

Table 4.10 Analysis of variance between the respondents' age categories and statements 10_1-10_12

	Sum of Squares	Degrees of Freedom	Mean Square	F-statistic	P-value
Between Groups	92,6	3	30,9	1,0	0,390
Within Groups	2462,4	81	30,4		
Total	2555,0	84			

Table 4.10 indicates that the F-statistic is 1,015 and the probability value is 0,390. A p-value of less than 0,05 is required for a difference to be statistically significant. In this instance the p-value is not less than 0,05. It can therefore be concluded that there is no significant difference between the respondents' age categories and their attitudes towards information literacy.

4.3.5.5 Difference between the respondents' information literacy training received and their use of information literacy competencies.

The one-way analysis of variance was used to test if there is a significant difference between the respondents' information literacy training received and the respondents' use of information literacy competencies. The types of information literacy training the respondents received are reflected in Question 5. The results of Question 5 are illustrated in Figure 4.4. The respondents' use of the information literacy competencies are reflected in statements 6_1-9_13. The table below illustrates the analysis of variance between the types of training the respondents received and their use of the information literacy competencies.

Table 4.11 Analysis of variance of the respondents' information literacy training received and statements 6_1-9_13

	Sum of Squares	Degrees of Freedom	Mean Square	F-statistic	P-value
Between Groups	1083,1	4	270,8	1,0	0,370
Within Groups	16184,3	65	249,0		
Total	17267,4	69			

Table 4.11 shows that the F-statistic is 1,087 and the probability value is 0,370. Because the p-value is not less than 0,05 it means the difference is not statistically significant. It can therefore be concluded that there is no significant difference between the information literacy training that the respondents received and their use of the information literacy competencies.

4.3.5.6 Difference between the respondents' information literacy training received and their attitudes towards information literacy

The one-way analysis of variance was used to test if there is a significant difference between the types of information literacy training that the respondents received and the respondents' attitudes towards information literacy. The types of information literacy training that the students received are reflected in Question 5 and the results are included in Figure 4.4. The respondents' attitudes towards information literacy are reflected in their responses to statements 10_1-10_12. Table 4.12 below shows the analysis of variance between the types of training that the respondents received and their attitudes towards information literacy.

Table 4.12 Analysis of variance between the respondents' information literacy training received and statements 10_1-10_12

	Sum of Squares	Degrees of Freedom	Mean Square	F-statistic	P-value
Between Groups	81,9	4	20,5	0,7	0,620
Within Groups	2473,1	80	30,9		
Total	2550,0	84			

Table 4.12 illustrates that the F-statistic is 0,662 and the probability value is 0,620. Because the p-value is not less than 0,05 the difference is not statistically significant. It can therefore be concluded that there is no significant difference between the types of information literacy training that the respondents received and their attitudes towards information literacy.

4.4 Chapter conclusion

This chapter focused on the detailed findings of the research study about the use of information literacy competencies and attitudes towards information literacy by students who are enrolled in a selected healthcare related programme at a University of Technology in South Africa. The data obtained from the respondents who completed an online questionnaire survey was analysed using different methods and tools in line with the identified research questions. Questions 2-5 focused on the demographical data of the respondents. This data was analysed with the use of descriptive statistics to gain an understanding of the responses of the respondents and how the specific responses of the respondents relate to the whole. The biographical information of the respondents was useful in answering research Question 4 that focuses on the differences in the use of information literacy competencies and attitudes towards information literacy.

Statements 6_1-6_6, 7_1-7_11, 8_1-8_9 and 9_1-9_13 of the online questionnaire survey focused on students' use of information literacy competencies. Respondents' responses to these statements were analysed using descriptive statistics. Overall, the number of respondents who indicated that they either strongly agree or agree with all the statements is higher than the number of respondents that indicated that they either disagree or strongly disagree with the statements. However, there are variations in the degree to which respondents agreed to the individual statements. Overall, it can be concluded that the respondents hold the view that they are able to use the information literacy competencies. The respondents have the perception that they are specifically able to: 1) locate information sources, 2) evaluate located information sources to determine their appropriateness for use and 3) use information in an ethical and legal manner. The analysis of the respondents' responses to statements 6_1-9_13 was useful in answering the first research question that focuses on the students' perceived use of information literacy competencies.

Statements 10_1-10_6 of the online questionnaire survey focused on the students' attitudes towards information literacy. Respondents' responses to these statements were analysed using descriptive statistics. Overall, the number of respondents who indicated that they strongly agree or agree to the statements is higher than the number of respondents who indicated that they disagree or strongly disagree. Overall, it can be concluded that the respondents have a positive attitude towards information literacy. The respondents specifically have a positive attitude towards the information literacy competencies to: 1) locate information sources, 2) evaluate located information sources to determine their appropriateness for use and 3) use information in an ethical and legal manner. However, there is a variation in the degree to which the respondents agreed to the individual statements. The analysis of the respondents' responses to statements 10_1-10_12 contributes to answering the second research question that focuses on the students' attitudes towards information literacy.

Correlational analysis was applied to statements 6-10 of the online questionnaire survey to establish if there is a correlation between the respondents' use of information literacy competencies and their attitudes towards information literacy. It was established that there is a significant correlation between the respondents' use of information literacy competencies and their attitudes towards information literacy. It was also established that there is a significant correlation between the respondents' perceived abilities to locate information sources, to evaluate information sources and to use information in an ethical and legal manner. Furthermore, it was established that: 1) there is a significant correlation between the respondents' cognitive-, affective- and behavioural components of their attitudes and 2) there is a significant correlation between the respondents' attitudes towards the information literacy competencies to locate information sources, evaluate information source and use information sources in an ethical and legal manner. The

correlational analysis of statements 6-10 contributed to answering the third research question that focuses on the correlation between the students' perceived use of information literacy competencies and their attitudes towards information literacy.

Analysis of variance was applied to statements 3-10 of the online questionnaire survey to establish if there are any significant differences between the respondents' perceived use of information literacy competencies and their attitudes towards information literacy, based on different demographic groupings. The analysis of variance revealed that there are no significant differences between: 1) the respondents' levels of study and their use of information literacy competencies, 2) the respondents' age (listed per category) and their use of information literacy competencies, 3) the respondents' age (listed per category) and their attitudes towards information literacy, 4) the types of information literacy training that the respondents received and their use of information literacy competencies and 5) the types of information literacy training that the respondents received and their attitudes towards information literacy. The analysis of variance also revealed that the difference between the attitudes of respondents who are currently on the third- and fourth levels of study is statistically significant. The analysis of variance of statements 3-10 contributed to answering the fourth and final research question that focuses on the differences between the respondents' use of information literacy competencies and their attitudes towards information literacy based on the different demographic groupings.

5 Discussion and recommendations

5.1 Introduction

This chapter focuses on a discussion of the results obtained in the previous chapter and the four identified research questions. This chapter also focuses on recommendations for implementation.

5.2 Discussion of results

5.2.1 Participation rate

233 students, who are enrolled in the selected healthcare related programme at a University of Technology in South Africa, constituted the target population of this research study. A census survey method was adopted, which means that the identification of a sample size was not required. However, to ensure that the results of the study is representative of the entire target population, a confidence level of 95% is needed. Responses from 221 participants would have ensured that the results of the study are representative of the target population. 92 respondents ultimately completed the online questionnaire survey. This constitutes a response rate of 39%, which is below 95%. Due to the timeline for the completion of the study, a longer data collection period could not be accommodated.

Research of Wu, Zhao and Fils-Aime (2022) indicates that the average online survey response rate is 44,1%. The actual response rate of this study is 5,1% lower than the average response rate of Wu, Zhao and Fils-Aime. Wu, Zhao and Fils-Aime mention that: "...pre-contacting the potential respondents yielded higher response rates" (2022). The research study was introduced to the target population during class visits before the online questionnaire survey became active as well as during the timeframe when the online questionnaire survey was active. There was an increase in the response rates shortly after the research study was introduced during class visits.

Based on the actual number of responses received, the results of the research study are therefore not representative of the entire target population. The findings of the study are therefore not applicable to all students who are enrolled in the selected healthcare related programme. However, the results of the study are still representative of the respondents who completed the online questionnaire survey and the findings of the study are applicable to the respondents who participated in the study.

5.2.2 Use of information literacy competencies

In this research study students' use of information literacy competencies was determined by the completion of an online questionnaire survey wherein respondents indicated their level of agreement with statements about their perceived abilities and proficiency to locate information sources, evaluate located information sources and use information in an ethical and legal manner. The learning outcomes of the information literacy module that the students in the selected healthcare related programme are required to complete, formed the basis of the statements included in the online questionnaire survey.

Adekunle and Madukoma (2022) mention multiple assessment instruments to measure information literacy, such as the Standardized Assessment of Information Literacy Skills of Kent State University, the Information Literacy Test of the Center of Assessment & Research Studies of James Madison University, the Educational Testing Service iSkills Assessment of California State University, the Information Skills Survey of the Council of Australian University Librarians and the INFOLITRANS Test of the University of Granada. These assessment instruments evaluate information literacy skills against established frameworks and standards of organisations such as the Association of College and Research Libraries and the Australian and New Zealand Institute for Information Literacy (ANZIL). The value of such assessment instruments cannot be disputed. However, the use of the aforementioned assessment instruments to assess students' use of information literacy competencies is not useful in this research study, because these assessment instruments are not aligned with the learning outcomes of the information literacy module that the students who enrolled for a specific healthcare related programme at a University of Technology in South Africa are expected to complete. Because the learning outcomes of the information literacy module that the students are required to complete formed the basis of this study, a comparison of the results of the use of information literacy competencies with the results of other research studies is not relevant.

With reference to the first research question, namely: **“What is the perceived use of information literacy competencies by students who enrolled in a specific healthcare related programme?”**, the following can be stated:

- Overall, respondents:
 - are able to describe the competencies of an information literate person,
 - understand the value of information literacy in an academic context,
 - are able to recognise the different types of information sources,
 - can differentiate between primary and secondary sources of information,
 - are able to select the correct type of information source based on a specific information need,

- are able to select a relevant search approach based on a specific information need,
- are able to analyse the topic of an assignment,
- are able to create a search string using Boolean operators, truncation and parentheses,
- have the ability to access the databases to which the University of Technology subscribes,
- can identify relevant databases based on a specific information need,
- are familiar with basic terminologies used by databases,
- are able to navigate the interfaces of databases that are relevant to their field of study,
- have the ability to use the different search options of databases that are relevant to their field of study,
- can refine search results of databases to enhance the relevancy thereof,
- are able to locate information sources using search engines such as Google,
- are able to use different search options of a search engine such as Google,
- understand the format of search results of a search engine such as Google,
- are able to explain why it is important to evaluate information sources that have been located,
- are familiar with the criteria that are commonly used to evaluate information sources,
- can establish the currency, authority, accuracy, purpose, objectivity and writing style of an information source,
- are able to apply the evaluation criteria that are commonly used to evaluate an information source in practice to determine the credibility of an information source,
- can identify the copyright status of an information source,
- are familiar with the fair use principle of information that is protected by copyright,
- know what is meant by the term plagiarism,
- are familiar with different types of plagiarism,
- can explain why it is important to cite and reference information,
- can access information about the citation and referencing styles used in the university,
- are familiar with the basic characteristics of the main categories of referencing styles used in the university,
- know what is meant by the term common knowledge,
- can explain the main types of common knowledge,
- can cite and reference information sources that are included in an assignment using the referencing style that is prescribed by their department,
- know the difference between a reference list and a bibliography,
- have the ability to compile a reference list and a bibliography and
- are able to apply proper citation and referencing techniques to correct plagiarism mistakes in an assignment.

- The comprehensive list of abilities and knowledge listed above constitutes the foundational building blocks of an information literate person at a University of Technology in South Africa. Based on the comprehensive list of abilities and knowledge it can therefore be concluded that the respondents are able to use the information literacy competencies 1) to locate information sources, 2) to evaluate located information sources to determine their credibility for use and 3) to use information in an ethical and legal manner. It can also be concluded that the respondents do not only exhibit the theoretical knowledge to locate, evaluate and use information – they are also able to apply the theoretical knowledge to locate, evaluate and use information in practice. This is an important observation, because competence not only involves a cognitive ability – competence is also rooted in praxis.
- The variance in the respondents' responses to statements 6-9 is indicative that the respondents are not homogenous in their use of information literacy competencies.
- The variance in the overall responses to statements 7, 8 and 9 indicates that the respondents' use of the three information literacy competencies also varies. Overall, the respondents' ability and knowledge to use information in an ethical and legal manner is higher than the abilities and knowledge to locate and evaluate information sources. The respondents' ability and knowledge to evaluate information sources is the lowest of the three.

5.2.3 Attitudes towards information literacy

The respondents' attitudes towards information literacy were determined by the completion of 12 statements. The statements were formulated and structured in a two-folded manner. Firstly, the statements were formulated to include the cognitive-, affective- and behavioural components of attitudes towards information literacy. Secondly, the statements were formulated to assess students' attitudes towards the competencies to locate, evaluate and use information in an ethical and legal manner.

With reference to the second research question, namely: **“What are the attitudes towards information literacy of students who are enrolled in a specific healthcare related programme?”**, the following can be stated:

- Overall, respondents:
 - believe that the information literacy competencies contribute positively to their success as students,
 - think that it is easy to locate information sources for an assignment,
 - believe that it is important to evaluate information sources that have been located in order to establish their credibility for use in an assignment,

- think it is important to use information in an ethical and legal manner,
 - feel that the information literacy competencies are relevant to their development as students,
 - feel confident to find information sources for an assignment,
 - feel confident to evaluate information sources to determine their appropriateness for use in an assignment,
 - feel confident that they are using information in an ethical and legal manner when they are completing an assignment,
 - constantly use the information literacy competencies when they complete an assignment,
 - always apply the competency to find information when they complete an assignment,
 - always apply the competency to evaluate information sources before they decide to include them in an assignment and
 - always ensure that they use information in an ethical and legal manner when they complete an assignment.
- Based on the responses to the statements related to the attitudes, it can be concluded that the respondents exhibit a positive attitude towards information literacy in general and to each of the three information literacy competencies in particular.
 - The respondents' responses to the statements indicate that their attitudes towards information literacy are informed by what they believe (cognitive component), how they feel (affective component) and how they behave (behavioural component). This finding corresponds with the research of Swain (2013); Pekrun, Elliot and Maier (2009) and Schunk and Zimmerman (2007).
 - Based on the variance in the respondents' responses to statements 10_1-10_12 it is clear that the respondents are not identical in their attitudes towards information literacy.
 - The variance in the overall responses to statements 10_1-10_12 indicates that the respondents' attitudes towards the three information literacy competencies also vary. Overall, the respondents' attitudes towards the information literacy competency to use of information in an ethical and legal manner are higher than their attitudes towards the competencies to locate and evaluate information sources. The respondent's attitudes towards their ability to evaluate information sources to determine their appropriateness for use in an assignment is the lowest of the three information literacy competencies.
 - The variance in responses to statements 10_1-10_12 also indicates that the cognitive-, affective- and behavioural components of the respondents' attitudes towards information literacy vary. The cognitive component of the respondents' attitudes towards information literacy is higher than the affective- and behavioural components. The behavioural component of the respondents' attitudes towards information literacy was the lowest of the three components.
 - When the respondents' responses to statements 10_1-10_12 are compared to each other, statements 10_9 and 10_11 were lower than the other responses. This means that the respondents are less likely to: 1) constantly apply the information literacy competencies when

they complete an assignment and 2) always apply the competency to evaluate information sources before they decide to include them in an assignment. Both of these statements relate to the behavioural component of the respondents' attitudes towards information literacy. Statement 10_11 relates to the information literacy competency to evaluate information sources.

5.2.4 Correlation between the use of information literacy competencies and attitudes towards information literacy

The correlation between the respondents' use of information literacy competencies and their attitudes towards information literacy was examined through correlational analysis. Pearson's product momentum correlation coefficient was used. A two-tailed test was used to test for statistical significance. Statements 6_1-9_13, which focus on the use of information literacy competencies, were correlated with statements 10_1-10_12, which focus on the attitudes towards information literacy.

With reference to the third research question, namely: **"Is there a correlation between the attitudes towards information literacy and the perceived use of information literacy competencies by students who are enrolled in a selected healthcare related programme?"**, the following can be stated:

- The analysis of data revealed that there is indeed a correlation between the respondents' attitudes towards information literacy and their use of information literacy competencies. This correlation is statistically significant.
- The study also revealed that there is indeed a correlation between the respondents':
 - use of the information literacy competency to locate information sources and their attitudes towards the competency to locate information sources,
 - use of the information literacy competency to evaluate information sources and their attitudes towards the information literacy competency to evaluate information sources and
 - use of the information literacy competency to use information in an ethical and legal manner and their attitudes towards the information literacy competency to use information in an ethical and legal manner.

In all three instances the correlation is statistically significant.

The finding of this study, that there is a statistically significant correlation between the respondents' use of the information literacy competencies and their attitudes towards information literacy, corresponds with the research studies of Diseiya (2018); Adekunle Olla et al. (2019), Osman (2017) and others. The study of Diseiya (2018) suggests that the increase of students' self-

efficacy and attitudes towards information literacy may increase their information literacy skills. The study of Adekunle, Olla et al. (2019) revealed that students' attitudes towards- and perceptions of information literacy significantly influence their information literacy skills. Research of Osman (2017) established that students' attitudes was one of multiple factors that had an impact on their acquisition of information literacy skills.

This study only focused on the question: Is there a correlation between the students' attitudes towards information literacy and their use of information literacy competencies. The study revealed that there is indeed a statistically significant correlation. This study does not explore the relationship between the students' attitudes and use of information literacy competencies in greater detail and thus it is not possible to describe how the respondents' attitudes towards information literacy influence their use of information literacy competencies and vice versa. It can, however, be reasoned that, given the statistically significant correlation between the respondents' attitudes towards information literacy and their use of information literacy skills, a change in their attitudes will also have a corresponding change in their use of information literacy competencies and vice versa.

5.2.5 Differences between the respondents' use of information literacy competencies and their attitudes towards information literacy

Differences between the respondents' attitudes towards information literacy and their use of information literacy competencies, based on the different demographic groupings of students, were explored through analysis of variance. Data from Questions 3-5 as well as data from statements 6-9 and statement 10 was used in the analysis of variance.

With reference to the research question: **"Are there any significant differences between the attitudes towards information literacy and the use of information literacy competencies by students in a selected healthcare related programme based on the different demographic groupings of students?"**, the following can be stated:

- An analysis of variance revealed that there is no significant difference between the respondents' use of information literacy competencies and their current study levels.
- An analysis of variance revealed that there is a significant difference between the attitudes of the respondents and their current levels of study. The Tukey-Kramer method revealed that the difference in attitudes is, specifically, attributed to the respondents who are currently in their third- and fourth years of study. The application of Levene's test confirmed that the homogeneity of variance assumptions was not violated.

Unfortunately, the reasons for the difference in the attitudes towards information literacy of the respondents who are in their third- and fourth years of study are not answered in this study, due to a lack of relevant data that can be used to draw valid conclusions.

- There is no significant difference between the respondents' use of information literacy competencies and their age categories.
- There is no significant difference between the respondents' attitudes towards information literacy and their age categories.
- There is no significant difference between the respondents' use of information literacy competencies and the types of information literacy training that they have received.
- There is no significant difference between the respondents' attitudes towards information literacy and the types of information literacy training that they have received.

At the time when the respondents completed the online questionnaire survey, students in their first year of study had already attended all lectures of the information literacy module. Approximately 50% of the learning outcomes of the module is achieved by attendance of lectures during which subject content is shared and class exercises are completed. The other 50% of the learning outcomes is achieved by the completion of self-study learning activities and corresponding quizzes on the learning management system of the institution. At the time when the respondents completed the online questionnaire survey, students in their first year of study still had to complete a final assessment in the form of an online test. Although the respondents who are in their first year of study had not successfully completed and passed the information literacy module yet, their attendance of lectures had an impact on their responses related to their attitudes towards information literacy.

The number respondents who have not yet registered for the information literacy module ($n=1$) is too low to make an analysis of variance statistically significant. It should also be noted that information literacy at the University of Technology is a generic module and therefore there is no difference in the learning outcomes of other information literacy modules that have the same credit allocation. The respondents who have completed another information literacy module offered by the same University of Technology ($n=8$) have achieved the same learning outcomes as the respondents who have completed the information literacy module that is part of the specific healthcare related programme. The similarity of the information literacy modules offered by the University of Technology also had an impact on the respondents' responses regarding their attitudes towards information literacy and their use of information literacy competencies.

This study is cross-sectional and focuses on the use of information literacy competencies and the attitudes towards information literacy at a single point in time. It is not part of the objective of this study to determine if and how respondents' use of information literacy competencies and attitudes

towards information literacy change over time based on their levels of study. The results of the analysis of variance between the respondents' study levels and their attitudes towards information literacy and use of information literacy competencies do not allow for additional conclusions to be drawn based on the differentiation of the study levels of the respondents.

5.3 Recommendations

Based on the elements that form part of this research study - the literature review, the research methodology, the analysis of the results and the discussion thereof - the following recommendations can be made:

5.3.1 Track students' use of information literacy competencies and attitudes towards information literacy throughout their academic career.

Information literacy is a lifelong endeavour. In the current information age, information literacy skills of individuals should develop and grow throughout life. The fundamental building blocks of information literacy competencies are laid during primary- and secondary education and continue during tertiary education. Furthermore, information literacy competencies continue to develop in a post-education career context. The purpose of the information literacy module that constitutes the focus of this research study is to equip first-year students with essential knowledge, skills and competencies to achieve academic success. As a cross-sectional study, the results of this study represent a snapshot of the respondents' use of information literacy competencies and their attitudes towards information literacy at a specific moment in time. There is a need to track students' use of information literacy competencies and their attitudes towards information literacy throughout their academic career. It is therefore recommended that a mechanism, similar to the online questionnaire survey used in this research study, be implemented to track changes to students' use of information literacy competencies as well as their attitudes towards information literacy. It is further recommended that students' use of information literacy competencies and their attitudes towards information literacy be tracked during the following three intervals: 1) upon registration prior to the commencement of the information literacy module, 2) after the successful completion of the information literacy module at the end of their first year of study and 3) upon completion of their initial qualification. This approach to assess students' use of information literacy competencies as well as their attitudes towards information literacy during the mentioned intervals will have the following benefits:

- A baseline is established of students' use of information literacy competencies and their attitudes towards information literacy. This baseline will assist in the optimisation of teaching and learning processes and -practices of information literacy at this University of Technology in South Africa.
- The impact of the information literacy module as a catalyst for the growth and development of students' information literacy competencies and attitudes towards information literacy can be quantified. Subsequently, a return on investment associated with the offering of the information literacy module can also be quantified.
- If the results of a baseline and subsequent assessments are made available to students, students will be able to reflect on and learn from their own experiences how their information literacy competencies have developed throughout their academic career and how their attitudes towards information literacy had an impact on their information literacy competencies and vice versa.

5.3.2 Implement an independent tool to assess students' use of information literacy competencies

This research study focuses on the students' perceived use of information literacy competencies and their attitudes towards information literacy. By completing the online questionnaire survey, respondents shared their honest opinions of their use of information literacy competencies using a Likert scale. In this study the respondents' use of the information literacy competencies are opinion-based. There is a need to use an independent objective tool to assess students' use of information literacy competencies that is not based on subjectivity or bias. Currently, the assessment strategy in the information literacy module is to establish the extent to which the learning outcomes of the information literacy module has been achieved.

It is recommended that an independent assessment tool be implemented to assess the extent to which students are information literate using a standardised set of indicators that are based on the current global frameworks of information literacy, such as the information literacy standards of the Association of College and Research Libraries, the seven information literacy pillars of the Society for College, National and University Libraries and the information literacy standards of the Australian and New Zealand Information Literacy Framework. The implementation of an independent assessment tool will enable students to determine their information literacy proficiency according to international standards. The adoption of an independent assessment tool should not replace the current assessment practices, but should be used in conjunction with the existing

assessment practices. This will enable students to monitor their information literacy development as a lifelong journey that extends beyond their academic careers at the University of Technology.

5.3.3 Revise pedagogical methodologies, -processes and -practices that underpin the information literacy module

This research study has clearly indicated that there is a significant correlation between the respondents' use of information literacy competencies and their attitudes towards information literacy. This finding is in line with research of Diseiya (2018); Adekunle Olla et al. (2019), Osman (2017) and others. Based on the significant correlation between the respondents' use of information literacy competencies and their attitudes towards information literacy, there is a need to revise the pedagogical methodologies, -processes and -practices that underpin the information literacy module. The following recommendations are thus made:

- Incorporate activities in the teaching and learning strategy of the module that will enhance the students' attitudes towards information literacy. Due to the significant correlation between the respondents' attitudes towards information literacy and their use of information literacy competencies, the use of information literacy skills can be increased by enhancing the respondents' attitudes towards information literacy. The research findings clearly illustrate in Figure 4.16 that the behavioural component of the respondents' attitudes towards information literacy scored lower (i.e. 89,4%) when compared to the cognitive (i.e. 97,5%) and affective (i.e. 95,3%) components. The behavioural component of the respondents' attitudes towards information literacy can be enhanced by increasing opportunities to practice the use of information literacy competencies in a simulated- and a real-life environment. The research findings also illustrated that the respondents' attitudes towards the information literacy competency to locate information sources (i.e. 91,1%) are lower than their attitudes towards the competencies to evaluate located information sources (i.e. 92,9%) and use information in an ethical and legal manner (i.e. 97,4%). By increasing the respondents' attitudes towards the competency to locate information sources, their use of the information literacy competencies will also be increased. The respondents' behaviour towards the competency to locate information sources can be enhanced by increasing opportunities to practice this competency in a simulated- and a real-life environment.
- Incorporate activities in the teaching and learning strategy of the module that will enhance students' use of the information literacy competencies. Due to the significant correlation between the respondents' use of information literacy competencies and their attitudes towards information literacy, the respondents' attitudes towards information literacy can be enhanced by increasing their use of the information literacy competencies. Research findings clearly

illustrate that the respondents' overall scores related to the information literacy competency to evaluate located information sources (i.e. 81,3%) were lower than their overall scores related to the information literacy competencies to locate information sources (87,1%) and use information in an ethical and legal manner (i.e. 91,2%), as reflected in Figure 4.12. It is recommended that the students' ability to evaluate located information sources be enhanced by:

- updating the content related to the evaluation criteria and
- increasing opportunities to practice the application of the evaluation criteria.

With reference to the respondents' ability to locate information sources, Figure 4.8 clearly illustrates that their ability to create a search string using functions such as Boolean operators, truncation and parentheses was more underdeveloped than the other learning outcomes that are related to the same information literacy competency. It is recommended that the module content be updated and the opportunities to apply Boolean operators, truncation and parentheses in practice, be increased. This will enhance the respondents' proficiency to locate information sources, which, in turn, will also lead to an increase in the respondents' attitudes towards information literacy.

With reference to the respondents' ability to use information sources in an ethical and legal manner, Figure 4.12 indicates that the respondents rated their ability to identify the copyright status of an information source (i.e. 83,3%) and their familiarity with the fair use principle (i.e. 81,1%) lower than the other scores that are part of the same competency. The students' use of the information literacy competency to use information in an ethical and legal manner can be enhanced by updating the module content related to copyright and fair use.

- Students' use of information literacy competencies and attitudes towards information literacy can also be enhanced by the incorporation of self-reflection practices. Research of Chang (2019) and others emphasise the role of reflection in learning. It is recommended that self-reflection be adopted as a fundamental element of the teaching and learning strategy of the information literacy module. By incorporating the use of a personal journal in the module and by including the completion of the journal as a compulsory assessment activity, students will be able to improve their use of information literacy competencies and enhance their attitudes towards information literacy through self-reflection and self-learning.

5.3.4 Future research

Based on the research findings and limitations of this study, the following suggestions are made for future research:

- Explore the cause-and-effect relationship between students' use of information literacy competencies and attitudes towards information literacy in more detail.
- Compare the use of information literacy competencies and attitudes towards information literacy by students in the selected healthcare related programme with students in other programmes offered by the same University of Technology in South Africa.
- Compare the use of information literacy competencies and attitudes towards information literacy by students in the selected healthcare related programme with students who are enrolled in a similar healthcare related programme at other universities in South Africa.
- Explore the significant difference between the third- and fourth-year respondents' attitudes towards information literacy.
- Evaluate the use of information literacy competencies by students in the selected healthcare related programme by using an independent assessment tool, so that the level of complexity at which students apply their knowledge and abilities is determined.
- Explore the progression and development in the use of information literacy competencies and attitudes towards information literacy by students in the selected healthcare related programme at the University of Technology in South Africa.

5.4 Chapter conclusion

This chapter focused on a discussion of the results of this research study as well as on recommendations. The results of the study were discussed in the context of the research questions. In this chapter the respondents' use of information literacy competencies and their attitudes towards information literacy were discussed. The correlation between the respondents' use of information literacy competencies and their attitudes towards information literacy is statistically significant, while the differences between the respondents' use of information literacy competencies and their attitudes towards information literacy, based on different demographic groupings, is statistically insignificant except for one instance.

Recommendations include: 1) the need to track students' use of information literacy competencies and their attitudes towards information literacy throughout their academic career, 2) the implementation of an independent tool to assess students' use of information literacy competencies and 3) the need to revise the pedagogical methodologies, -processes and -practices

that underpin the information literacy module. Recommendations were also made for future research.

6 Conclusion

This study focused on the use of information literacy competencies and attitudes towards information literacy by students who are enrolled in a selected healthcare related programme at a University of Technology in South Africa. Chapter 1 provided a background and rationale for the study by exploring different concepts. The research objectives were also stated. Chapter 2 focused on a brief literature review of the core concepts that underpin this study. The development of information literacy, attitudes towards information literacy, the role of connectivism in information literacy as well as the historical development of information literacy at the University of Technology in South Africa were explored. Chapter 3 explained the research methodology. Chapter 4 included an analysis of the data as well as a description of the results. The purpose of Chapter 5 was to discuss the results in the context of the research objectives and focus on recommendations that emanated from the study.

Because insufficient responses were received, no conclusions could be made that is representative of all the students who enrolled for a selected healthcare related programme at a University of Technology in South Africa. Nevertheless, it can still be stated that, overall, the respondents indicated that they have a basic proficiency to locate information sources, to evaluate located information sources to establish their credibility for use and to use information in an ethical and legal manner. Overall, the respondents also indicated that they have positive attitudes towards information literacy.

The study indicated that there is a significant correlation between the respondents' use of information literacy competencies and attitudes towards information literacy. The study also revealed that the differences between the respondents' use of information literacy competencies and their attitudes towards information literacy based on their demographic groupings are statistically insignificant. The results of the study will contribute to the continuous improvement of the module content and the offering thereof if the recommendations are implemented in practice.

7 Personal reflection

This chapter provides a short reflection on my journey and experiences in completing the Master's degree in Educational Management and this research study in particular.

After a break in formal education of more than twenty years, I became a student again. I commenced with the contact weeks amidst a time when Covid-related regulations and practices were still enforced. My excitement to be part of online learning outweighed my initial reservations. The collaboration and interaction with fellow students during the contact weeks and in-between the contact weeks were a source of inspiration and motivation for me. I found reassurance in the fact that I was part of group of fellow employees, who were all committed to excel as students.

As I look back at the past three years, I can see several instances where the content covered during the contact weeks has altered my work in significant ways - and it continues to do so.

The need to effectively balance my studies, work and personal life was quite a challenge. I often faced conflicting priorities which occasionally resulted in feelings of being overwhelmed. The data collection phase of my research study was delayed for approximately nine months, due to institutional challenges in obtaining approval to undertake the research study. Unfortunately, this delay has contributed to my challenge to effectively balance my studies, work and life.

During this research study I, again, realised the critical importance of effective time management, self-discipline and commitment. I have also come to the realisation of the value and impact of self-motivation and self-care.

I feel immensely grateful to have been offered this opportunity. I wish to extend my sincere gratitude to all the role players who have supported me in different ways throughout this journey.

Thank goodness I am done - Luojan kiitos olen valmis.

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Appendices

Appendix 1. Information leaflet



CJS Botha - Cover
Letter - Anonymous S

Appendix 2. Online survey questionnaire



Questionnaire on the
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