

STUDENTS' PRACTICES OF ACADEMIC STUDY SKILLS AT UNIVERSITY OF RWANDA, NATIONAL POLICE COLLEGE

by

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Declaration

I certify that this Thesis “**STUDENTS’ PRACTICES OF ACADEMIC STUDY SKILLS AT UNIVERSITY OF RWANDA, NATIONAL POLICE COLLEGE**” is my original work and has never been submitted for any other degree at the University of Rwanda or any other institution.

Delphine Mukingambeho



I hereby approve the final submission of this thesis “**STUDENTS’ PRACTICES OF ACADEMIC STUDY SKILLS AT UNIVERSITY OF RWANDA, NATIONAL POLICE COLLEGE**”.

Main Supervisor: Dr. Nizeyimana Gabriel (PhD)



Dedication

To my family

My sisters and brothers

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Abstract

The present study interrogates students' study skills in higher education in Rwanda. It aims at exploring University of Rwanda (UR) undergraduates' practices of academic study skills at National Police College (NPC). Explicitly, the study seeks to: 1) find out the extent to which students self-report their conversancy with study skills; 2) identify variations among undergraduate students' study skills based on their demographics; 3) determine dimensions within the study skills questionnaire; 4) demonstrate how students rate themselves in different subscales of study skills; and 5) examine factors shaping students' study skills. The study adopted the pragmatic paradigm with mixed- method approach and follows an explanatory sequential design based on a survey questionnaire administered to 398 students and focus group interviews among 60 students of Professional Police Studies (PPS), Law and Computer Science with the option of Information Security (CSIS). The study was grounded in the Social Cognitive Theory and Learning Approaches. Students were purposively chosen as respondents in this study. Then, a census for small populations was used to choose respondents for quantitative data collection while homogenous sampling technique was applied to choose respondents for focus group interviews. Quantitative data were analyzed by means of SPSS 25 and AMOS 25. The analysis involved descriptive statistics, inferential techniques such as the independent samples t-test and the one-way ANOVA, Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) techniques. Qualitative data were thematically analyzed. Five major findings emerge from this study. Firstly, results show that students are moderately conversant with the investigated study skills; they are somehow good in time management but have difficulties in test preparation skills (paper 1). Next, students' study skills vary in relation to their demographics except gender which was found to influence test preparation and test-taking skills only (paper 2). Thirdly, the study skills scales are multidimensional with three factors for time management, note taking and writing skills and two factors for reading, test preparation and test taking skills. Fourthly, students are somehow good in time use and time punctuality, notes taking readiness, form- reading strategies, writing proficiency, information gathering abilities; and technical abilities in preparing and taking tests. However, they experience difficulties in time-planning, notes wording and polishing, content-reading strategies, referencing skills, psychological abilities in preparing tests and standardized attitudes before submitting scripts (paper 3). Fifth, three categories of factors

(institutional, student and teacher related factors) interplay to shape students' study skills (manuscript 4). Thus, students should be supported to improve their study skills by taking into consideration their demographics, and identified hindering factors for quality learning. The study recommends, among others, the elaboration of a study skills handbook to be use as a common guide to all UR students, the provision of guidance and counselling services on the use of good study skills at NPC and a mass study skills improvement campaign in all colleges of UR to raise awareness of study skills relevance and development at higher education level.

Key words: Higher education, Psychometrics, Rwanda, Study skills, Undergraduates.

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Abbreviations and acronyms

AMOS	: Analysis of Moment Structures
ANOVA	: Analysis of variance
CFA	: Confirmatory Factor Analysis
CS	: Computer Science
CSIS	: Computer Science with the option of Information security
DIGP	: Deputy Inspector General of Police
Dr.	: Doctor
EFA	: Exploratory Factor Analysis
HEC	: Higher Education Council
MINECOFIN	: Ministry of Finance
MINEDUC	: Ministry of Education
Mr.	: Mister
NPC	: National Police College
PPS	: Professional Police College
RNP	: Rwanda National Police
SPSS	: Statistical Package for the Social Sciences
UR	: University of Rwanda
UR-CASS	: University of Rwanda- College of Arts and Social Sciences
UR-CST	: University of Rwanda- College of Science and Technology

Chapter I: General introduction

1.1 Background of the study

The importance of teaching and learning process can't be denied. This process can only become successful on two conditions: (i) when teachers have a thorough understanding of their subjects and can effectively transmit it to students, and (ii) when students have a clear understanding of their abilities, and are able to use effective study skills, and (Bajwa, et al., 2011). Study skills are defined as strategies and techniques used in learning that allow students to efficiently use their time, resources and academic potential. They include a variety of directly and indirectly observable behaviours that students might engage in before, during, and after learning to retain and apply information acquired in the classroom and beyond (Shackebaei, et al., 2015).

Study skills are critical for university students' academic and future success. Indeed, in both academic and non-academic milieus, the quality of study skills influences success or failure. (Yahaya & Yalwa, 2016). Given the independent nature of postsecondary education, study skills are especially important for academic achievement (Shetty & Srinivasan, 2014). They are a vital set of transferrable life skills that students will use in new situations after completing their studies (Magut, 2015).

However, a number of studies (Maphosa et al., 2014; Pepe, 2012; Thamavithya, 2011) reveal that one of the root causes of students' low performance is their lack of good study skills. Similarly, the vast majority of lecturers acknowledge that how students choose to study is often the fundamental reason of their poor performance. In fact, there are incidents of students' failures and malpractices despite lecturers' efforts to clarify the teaching material and provide students with the required support,. All these issues reflect that students have problems along with their learning process. Moreover, extensive research on study skills has been conducted elsewhere especially in some developed and developing countries (Ayodebe & Adebisi, 2013; Khurshid, et al., 2012; Maphosa, et al., 2014; Mashayekhi, et al., 2014; Oluwatimilehin & Owoyehe, 2012; Shetty & Srinivasan, 2014; Thamavithya, 2011). But, in Rwanda, there is a scarcity of such research. Hence, the current study serves to fill this vacuum by exploring how students study in the context of Rwanda.

Furthermore, when investigating students' study skills, the existing literature has tended to focus on the relationship between academic achievement and study skills among university students (Ayodebe & Adebisi, 2013; Khurshid, et al., 2012; Maphosa, et al., 2014). However, there has been minimal focus on students' strengths and weaknesses in different aspects of study skills (Mashayekhi, et al., 2014; Oluwatimilehin & Owoyehe, 2012); let alone the variability of students' study skills in terms of demographic factors (age, marital status and gender, working experience, year and field of study). Correspondingly, earlier studies included both variables, namely the level and variability of students' study skills, into one study. As a result, a separate detailed investigation of each of these variables would yield more information. Keeping this in mind, the researcher felt compelled to exclusively investigate UR students' study skills in connection to their demographics. The study looks at how study skills interact with students' demographics. Furthermore, different research have come to different conclusions in an attempt to explore the relationship between students' study skills and their demographic characteristics. While some research support this relationship (Bulent, et al., 2015; Khan, 2016; Koki & Abdullahi, 2014; Ossai, 2012; Naqvi, et al., 2018; Powell, 2011; Tambawal, 2011), others disagree (Ayodele & Adebisi, 2013; Bavi, et al., 2014; Ezeala & Siyanga, 2015; Sekar & Rajendran, 2015). As a result, more research is required to better deepen, expand, and clarify this contentious relationship.

Likewise, while several studies examined the quality of students' study skills in higher education (Ayodele & Adebisi, 2013; Didarloo & Khalkhali, 2014; Ezeala & Siyanga, 2015; Kumar, 2015; Mashayekhi, et al., 2014; Mukingambeho, et al., 2019; Nourian, et al., 2010; Pepe, 2012; Sekar & Rajendran, 2015; Shackebai, et al., 2015; Shahidi, et al., 2014; Somuah, et al., 2014), most of them did not deepen their analysis to identify factor-structures and determine how students self-report in different facets of study skills scales. The present study fills in this knowledge gap by conducting a psychometric analysis of the study skills questionnaire administered to undergraduates under this study. Inherently, it's worth noting that the bulk of those research revealed that students register moderate to poor study skills (Didarloo & Khalkhali, 2014; Ezeala & Siyanga, 2015; Fereidouni & Cheraghian, 2009; Kumar, 2015; Mashayekhi, et al., 2014; ; Mukingambeho, et al., 2019, Nourian, et al., 2010; Pepe, 2012; Sekar & Rajendran, 2015; Shackebai, et al., 2015; Shahidi, et al., 2014; Somuah, et al., 2014). Nonetheless, none of these studies explored the factors underscoring levels of student study skills. In other words, there is a general paucity of such research even in Rwanda. Therefore, the present research is an effort to

contribute to quality learning in higher education and knowledge production to the existing literature about the dimensionality of study skills questionnaire and how students self-report themselves in different facets of study skills scales as well as factors shaping their study skills.

As conducted on UR undergraduate students studying at NPC in Musanze district, Northern Province, this study focused on six set of study skills given their prevalence and recurrence in the process of teaching and learning. They comprise time management, reading, note-taking, writing, test preparation and test taking skills. It concerned three programs of study namely PPS, Law, and CSIS. The study was carried out at NPC because the concerned respondents undertake their studies and live in that college. Besides, in contrast to other UR constituencies, the whole student body of NPC is made up of police personnel. Consequently, the researcher felt the need to carry out a separate study because mixing students' police officers with other civilian students in one study would not give an accurate image of their study skills because of their particular status and living conditions. Other studies can come in to complement the current study by exploring the academic study skills of other UR Colleges and compare them with the findings of the current study.

It is important to mention that NPC is not one of the UR colleges but a training institution of Rwanda National Police (RNP) located in Musanze district, Northern Province (RNP, 2015). NPC offers both professional and academic programs such as Master of Peace Studies and Conflict Transformation and undergraduate programs. These academic programs are undertaken in partnership with UR, which provides the teaching staff and awards degrees while RNP pays academic expenses and provides the study environment i.e. NPC (NPC, 2016). Four undergraduate programs offered at NPC include PPS, Law and languages which belong to UR-CASS; CSIS which is part of UR-CST and Forensic Science which is still under RNP management but taught by UR lecturers. The current study focuses on the three programs (PPS, Law, and CSIS) because languages program was not started yet when this study begun in 2016. Unlikely, Forensic Science was still in the hands of NPC but in the process of being a program of UR.

This study fits well with the researcher PhD area of specialization in Education, Curriculum and Instruction in a number of ways. First, the research topic "Students' practices of academic study skills at University of Rwanda, College of Education" falls well in education domain as it explores aspects of students learning "study skills". Secondary, with reference to the meanings of the terms curriculum and instruction and their relationship, the study looked at how students study (learning

which goes together with teaching/ Instruction) what is taught (curriculum). Although, the definition of instruction and curriculum is subjective and both terms may take on different meanings based on the purpose or interpretation whether political, social, or educational, Flake (2017) explains that curriculum is the content of what is being taught and instruction is the implementation of teaching according academic curriculum. Moreover, Flake (2017) clarifies that there is an intimate relationship between curriculum and instruction which is described as a parent and child relationship. Curriculum takes the role of a parent who is independent and may function without instruction; whereas, academic instruction is inherently dependent upon curriculum—much like a child is dependent upon a parent. Curriculum provides direction for instruction since instruction is the method of delivering academic curriculum. Instruction may exist without curriculum but would serve no direct purpose. Curriculum and instruction must be compatible and maintain a close relationship in order to maximize student learning. The design of curriculum influences student learning. Curriculum is a vessel that helps learners gain knowledge, develop skills and broaden understanding and has outcomes that may be measured. In line with this, the study demonstrated that much efforts are to be made and effective strategies are to be designed by UR and NPC to improve the way students learn the curriculum.

The present thesis is based on paper publications. Paper one relates to the research objective 1, paper 2 is linked to research objective 2, paper 3 with research objective 3 and 4 while paper 4 correlates with the research objective 5. Papers 1 and 2 were published, paper 3 was accepted for publication in International Journal of Creative Education and paper 4 is ready for submission to a potential journal. In sum, the thesis generated the following publications:

- Mukingambeho, D., Nzahabwanayo, S., Nizeyimana, G., & Nzabwirwa, W. (2019). Levels of study skills among undergraduate students in Rwanda. The case for the National Police College. *Interchange*, 50 (2), 221-247. <https://doi.org/10.1007/s10780-019-09361-5>.
- Mukingambeho, D., Nzahabwanayo, S., Nizeyimana, G., & Nzabwirwa, W. (2021). Variability of study skills in higher education: the case of Rwandan undergraduate students at the National Police College. *South African Journal of Higher Education*, 35 (4), 138-161. <https://dx.doi.org/10.20853/35-4-4240>.

- Mukingambeho, D., Nzahabwanayo, S., Nizeyimana, G., & Nzabwirwa, W. (2022). A psychometric analysis of the study skills questionnaire for University of Rwanda undergraduate students at National Police College. *Creative Education*, 13 (3), 862-885. <https://doi.org/10.4236/ce.2022.133057>.
- Mukingambeho, D., Nzahabwanayo, S., Nizeyimana, G., & Nzabwirwa, W. (2022 forthcoming). *Factors shaping the study skills of University of Rwanda undergraduate students at the National Police College*.

1.2 Statement of the problem

Education is a crucial investment in Rwanda's future development (MINEDUC, 2018). In this regards, the Ministry of Education (MINEDUC) has been tasked with facilitating the development of human capital for Rwanda's socio-economic growth and development (MINEDUC, 2013). In the same vein, the Higher Education Council (HEC) must ensure that higher learning institutions develop people who are capable of effectively contributing to Rwanda's economy (MINEDUC, 2013). The success of these missions is dependent on the performance of university students, which performance plays a critical role in producing high-quality graduates who will serve as outstanding leaders and manpower for the country (Alos, et al., 2015).

However, UR undergraduates' academic performance at NPC has a lot of room for improvement taking the case of PPS department – one of NPC academic programs. For the academic years (2013-2014 & 2014-2015), all PPS students' overall pass rate was only 66% (PPS Database, 2015). This rate of success suggests that the great majority of students failed a significant number of modules. In this regard, a number of studies (Rwehumbiza, 2013; Shetty & Srinivasan, 2014) contend that students' failure to succeed is most frequently a direct result of poor study skills. Equally, some studies conducted in Rwanda admit that students do not perform well in some study skills. With reference to the writing skills, Twagilimana and Naidoo (2020) reported that students at UR present poor learning outcomes in academic writing as indicated by the analyzed scripts and teachers' repeated complaints. Other studies (Rosendal, 2009 as cited by Twagilimana, 2017) show that students have writing challenges at Rwanda's higher learning institutions. Lecturers also confirmed that students present difficulties in academic writing at UR. Their work

is too often marked by excessive plagiarism and a lack of regard for academic writing traditions, low level of English general communication capabilities as well as a lack of writing experience for new students entering Rwanda's higher education institutions (Twagilimana & Naidoo, 2020; Twagilimana, 2017). Similarly, a survey of graduates from higher education institutions and their employers' satisfaction with their competencies (HEC, 2015) found issues in levels of practical skills, written and oral communication in terms of general knowledge and language English and/or French proficiency (MINEDUC, 2018). Furthermore, in Rwanda, there is a noteworthy complaint regarding university graduates' competences, which are believed to be lacking in soft skills such as communication, critical thinking, the ability to solve new challenges, innovation, and working in multi-disciplinary teams (Gahiji, 2015; MINECOFIN, 2013). Yet, soft skills are part of cognitive and social study skills that students are supposed to develop while still at school.

Basing on the above described situation, higher learning institutions are implausible to produce citizens capable of becoming contributing members of Rwandan society if the poor academic performance of students is not addressed promptly (MINEDUC, 2013). This implies consideration about factors connected to academic success and study skills are one of them. Indeed, students' achievement is a manifestation of their study skills, which are formed and strengthened through education (Siahi & Maiyo, 2015). Consequently, students must establish effective study skills in order to academically succeed (Dwarika-Bhagat, et al, 2017) and students' study skills, significantly, culminate in determining an individual's destiny, and the development of solid study skills assists not only in academics but also in job actualization (Siahi & Maiyo, 2015). Hence, the study of variables having relationships with academic achievement is of paramount importance.

Therefore, referring to the aforementioned situation of UR students' poor performance, low levels in some study skills and the gaps found in the existing literature about undergraduate students' study skills and shortage of such research in Rwanda, the researcher deemed it necessary to critically explore UR undergraduate students' practices of academic study skills with emphasis on one specific category of police officers' students who were found to have unsatisfactory average performance. Indeed, students with well-developed study skills will succeed academically and become more confident, competent, productive, and intelligent in both personal and professional life (Magut, 2015).

1.3 Objectives of the study

This study aims at exploring UR undergraduate students' practices of academic study skills at NPC. Specifically, the study sought to:

- To find out the extent to which students self-report their conversancy with study skills;
- To identify variations among students' study skills based on their demographics;
- To determine dimensions within the study skills questionnaire;
- To demonstrate how students rate themselves in different subscales of study skills;
- To examine factors shaping students' study skills.

1.4 Research questions

To attain the above objectives, the study was directed by the following research questions:

- To what extent are students conversant with study skills?
- How do students' study skills vary with their demographics?
- How is the dimensionality of the study skills scales under investigation?
- How do students rate themselves in the identified study skills dimensions?
- What are the factors shaping students' study skills?

1.5 Significance of the research

The interest to carry out this research was enthused by the observed unsatisfactory students' performance and challenges in study skills, which are presented as one of the most crucial aspects determining students' achievement in academic and personal life. Equally, the motivation to engage in this study came from the gaps observed in previously conducted studies on students' study skills at university. So, the findings of this study would assist higher education stakeholders in a number of ways. The study provides a better and comprehensive grasp about UR undergraduates' study skills at NPC and variables shaping their study skills. In other words, all concerned UR stakeholders are provided with substantial information and insight about levels of students' study skills, variability of their study skills in relation to their demographic features, students' strengths and weaknesses in various aspects of study skills and factors shaping their study

skills. Thus, they would take adequate strategies for optimizing academic outputs and for better attainment of their education visions, missions and goals. A thorough understanding of students' study skills would allow UR management to devise relevant educational interventions to address shortcomings in the identified aspects of students' study skills by taking into account their demographics and hindering factors when promoting high-quality learning. As Ayodebe and Adebisi (2013) argue, improvements in students' study skills will result in improved academic success and national development as qualitative manpower will be produced.

Since this study focuses on students who are simultaneously police officers, the findings would help the RNP and NPC to see whether they are meeting their main objective of becoming a professional law-enforcement institution appreciated at home and beyond, and take necessary measures to address the identified challenges for a better academic training of its personnel.

The study would give a clear picture to lecturers on how students study and difficulties encountered in the course of their studies. Thus, they would improve their teaching methods and strategies and support students to develop good study skills by taking into consideration their demographics and identified challenges. Additionally, students would be aware of their study strengths and weaknesses in different aspects of study skills and take appropriate measures to improve or keep the momentum. Furthermore, the study provides a psychometric tool i.e. a valid and reliable study skills questionnaire that could be used by other researchers to measure study skills of higher education students in Rwanda and beyond. Finally, other researchers could refer to the findings of this study for further related studies.

1.6 Historical context of study skills

Research on study skills has not a very long history (Fazal, et al., 2012). Even though their history is not hot, it is not also forgotten (Richardan, et al., 2010). College teachers in the domains of psychology and education used research, theory, and experience with their own students to write manuals in the 1950s and 1960s (Richardan, et al., 2010). The first study skill courses were introduced in universities in the middle of the 1950s. These remedial classes emphasized reading, writing, and note-taking skill abilities (Marvin, 1979 cited by Fazal, et al., 2012). In his book, *Helping your teen-age student*, published with 1979, Marvin Cohn guided parents on how to assist teenagers and young adults in their studies (Marvin, 1979). In 1980s, teachers and researchers

believed that these skills could be taught even at the preschool level (Fazal, et al., 2012). In the same vein, Dr. Gary Gruber had written 22 books on standardized tests when his *Essential guide to test taking for kids* was first published in 1986. The guide, in two volumes, contains strategies for taking tests and schoolwork, one for upper elementary and the other for middle school (Fazal, et al., 2012).

In high school and at the university level, study skills are increasingly taught and researched. From works on specific techniques, such as Tony Buzan's books on mind-mapping from 1972 to 2013, to general guides to successful study, such as those by Stella Cottrell from 1999 to 2021 and understanding examination techniques and effective study strategies (Rwehumbiza, 2013), there are a variety of books, websites, and research studies (Cottrell, 2021). Since the 1970s, several research topics on students' study skills were conducted where some of them clarified that students must learn how to study in a different environment, specifically the electronic environment so as to be competitive in the current world (Richardson, et al. 2010). In the past two decades, research topics focused on levels of students' study skills, relationships between study skills and students' performance, variability of study skills with students' demographic features, factors influencing study skills with little attention to psychometric analysis of study skills instruments. As a result, the current study is consistent with past research on students' study skills in a university setting.

1.7 Theoretical perspectives

The current study is based on Bandura's Social Cognitive Theory (SCT) (1989) and approaches to learning which are concerned with the cognitive theory. The researchers preferred these theoretical perspectives because they fit with this study and were used by other researchers in similar studies (Siahi & Maiyo, 2015; Dwarika-Bhagat, et al., 2017). Bandura's theory emphasizes individual traits such as personal efforts, peer support, and other forms of influences for learning to take place and be successful (Bandura, 1989). The core premise is that social and psychological factors effect individuals through indirect or direct processes such as self-regulatory and self-reflective processes (Bandura, 1986). In this way, Bandura (2001) highlights the importance of human agency, self-regulation, and self-efficacy in learning. Learners' human agency refers to their deliberate decision to invest in learning and change their behavior (Bandura, 2001). Self-regulation is defined as self-

generated ideas, feelings, and actions that are planned and cyclically altered to achieve personal objectives (Boekaerts, 2005) while self-efficacy refers to a person's confidence in his or her ability to successfully regulate activities or occurrences in their lives. It is founded on the belief that the individual has the necessary cognitive capacity, motivation, and resources to finish the task (Wood & Bandura, 1989). Self-efficacy is related to one's efforts, tenacity, and activity choice and affects students' motivation and learning (Pajares, 1996, 2006; Schunk, 1995, 2003).

In relation to this study, students' study skills are products of interaction between students' personal and social influences. Levels and variability of students' study skills certainly are determined by their personal efforts, peer support and other sources of influence. Besides, their learning efforts, demographics, sociocultural environment, and other sources of stimulation, all influence their time management, note-taking, reading, writing, exam preparation, and test-taking skills. Put another way, the investigated study skills are certainly influenced by individual and social contexts. These influences may have an impact on students' learning approaches, resulting in qualitative discrepancies in how they approach learning (Prosser & Trigwell, 1999). Similarly, students' learning approaches may be influenced by their demographics. Thus, to develop effective study skills, students must make purposeful decisions to invest in learning, adjust their behaviors, and organize their actions. To engage in self-regulatory actions, they must be self-efficacious students. As a result, this research verifies or refutes these theoretical perspectives while investigating how students approach their studies and the elements that influence their learning approaches.

1.8 Research methodology

1.8.1 Research design

This study adopted a pragmatic paradigm which proposes the use of the most appropriate methodological approach for the research problem under investigation (Creswell & Clark, 2011; Kaushik & Walsh, 2019). The paradigm suggests a mixed- method approach and advocates the use of both qualitative and quantitative research methods (Revez & Borges, 2018). Consequently, this paradigm was chosen as a philosophical foundation for this study because our research questions can best be answered through a mix of both research methods. In this context, the study follows an explanatory sequential design (Creswell, 2012). With this design, quantitative data were first collected and analyzed, followed by qualitative data collection and analysis to explain quantitative data. This explanatory sequential design was also used by Mutimani (2016) in a similar study.

Both quantitative methods (a questionnaire) and qualitative methods (focus group interviews) were used to obtain a full and deeper insights of students' experiences (Baruthram, 2017; Chokwe, 2013) about their academic study skills. Their combination provides a deeper comprehension of one's study problem (Creswell, 2011) and were used by other researchers in similar studies (Chokwe, 2013; Mutimani, 2016; Naqvi, et al., 2018).

1.8.2 Study area

The study was conducted at NPC located in Musanze district, Northern Province. It is a training institution of RNP having academic programs run by UR including Masters' and undergraduate programs. The current study deals with the last programs where the problem of poor performance was observed. NPC was purposively chosen as the research site because targeted population study in the premises of the college.

1.8.3 Study population

Participants were 398 undergraduate students of PPS, Law and CSIS programs of all years of study, from year one to year four, in the 2016-2017 academic year. Students were purposively chosen because they were the best to report their own experiences about their academic study skills under investigation. This is supported by Hakim (2014) who affirmed that students' opinions are currently considered as indispensable to appraise quality education at universities. Therefore, when reporting about how they engage with study skills and existent influences on their way, their views can be considered while improving quality learning and ultimately quality education.

Males and females were both represented in the study; however males (87.9%) outweighed females (12.1%) in quantitative data collection and in qualitative data collection (16.6%). The low number of females was not astonishing because MINEDUC (2018) highlighted that higher education in Rwanda continues to be dominated by males especially in public higher learning institutions. Likewise, Tusiime, et al. (2017) confirmed this under representation of females in Rwandan public universities (31.1% of female against 68.9% of males). The authors explained that one of the reasons is to be located in admission criteria to public universities in Rwanda, which refers to students' good performance and males perform better than female students at the upper secondary level.

1.8.3 Sampling techniques and sample size

Using a census for small populations, the whole population of 398 students was used for quantitative data collection since the number was found not too large to be sampled. For qualitative data collection, homogeneous sampling was used and 5 students per class for focus group interviews were selected because all students were considered to be knowledgeable about the research topic and have similar traits for each class. This made a total of 60 students for 12 classes. The choice of 5 group members known as a mini-group made up of 4 to 7 members (Cortini, et al., 2019; Nyumba, et al, 2018) was motivated by the fact that through discussion, multiple viewpoints are captured. Besides, different previous studies mentioned it as the ideal group's numerosity (Cortini, et al., 2019; Nyumba, et al, 2018). Besides, as applied in this study a series of as many as five focus groups could be used to engage up to 60 people in a few hours.

Furthermore, the researcher found the group of 5 members manageable, as equally confirmed by Cortini, et al. (2019). Focus group interview was chosen as a technique of collecting qualitative data because 1) of its increasing application in education (Nyumba, et al., 2018); 2) it generates multiple views and can therefore help to provide in depth and detailed students' own experiences about factors shaping their study skills; 3) it helps to clarify and extend quantitative findings (Nyumba, et al., 2018); and 4) similar studies on factors influencing students' study skills used the technique (Nyumba, et al, 2018).

1.8.4 Research instruments

Quantitative data were collected through a self-reported and closed-ended questionnaire adapted from Bajwa, et al. (2011) and Sabbah (2016). The tool has two main parts: The first part deals with students' identification in terms of gender, age, marital status, working experience, year of study and program of study. The second part was a five-point Likert-type scale survey (1 = never, 2 = rarely, 3 = sometimes, 4 = often, 5 = always). It included six study skills: time management (13 items), notes-taking (11 items), reading (11items), writing (14 items), test preparation (9 items), and test-taking study skills (12 items). Qualitative data were collected using interview guide of six open questions.

1.8.5 Piloting of the study

Prior to larger data collection, a total of 95 Forensic Science students participated in the pilot study for quantitative data and 5 Forensic Science students for qualitative data collection. Although NPC students, participants to the piloting phase were not yet UR students but they are taught by UR lecturers like the three programs involved in the study. The research instruments were refined basing on answers from the piloting phase.

1.8.6 Data collection

Quantitative and qualitative data from both the questionnaire and focus group interviews were face to face collected in students' respective classrooms at NPC in 2017 and 2018 during a period of two weeks for both types of data.

1.8.7 Reliability and validity of the research instruments

The questionnaire was found to have a high reliability of 85.7% since the overall reliability coefficient (Cronbach's Alpha) was 0.857 for all the 6 study skills scales in both pilot phase and real data collection phase. Content validity was also assured because the questionnaire and interview guide were set referring to the research objectives and were approved by supervisors before data collection. Besides, different groups of students with different demographics were objects of the study.

1.8.8 Data analysis

Quantitative data were analyzed by means of SPSS 25 and AMOS 25. The analysis involved descriptive statistics which helped to find out levels of students' study skills scales and subscales. Inferential techniques such as the independent samples t-test and the one-way ANOVA were used to establish the variability of students' study skills with regard to their demographics between respectively two and more groups. Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) techniques were applied to establish patterns of structures in each study skills set. The EFA is a data reduction technique that helps classify a list of items into factors or clusters. Items in the same cluster (called 'factor') are usually related and can be named referring to their common features (Field, 2009). In this study, Principal Component Analysis (PCA) was used to conduct the EFA in order to establish patterns of structures in each study skills set. On the other hand, the CFA is a technique meant to establish whether the structure provided by EFA fits the data. It shows the extent to which the established model fits the data; it measures good fit or poor fit (Brown, 2015; Byrne, 2013). While conducting EFA on the study skills, three assumptions were verified: the determinant, Kaiser-Meyer-Olkin (KMO), and Bartlett Test of Sphericity. The 'determinant' is a measure of the absence or presence of multicollinearity (high levels of correlation between items). The KMO is an indicator of the sampling adequacy while the Bartlett Test of Sphericity gauges the strength of the bivariate relationship between items under investigation (Field, 2009, Plichta & Kelvin, 2013).

The extraction of factors was performed to identify a number of dimensions that fit each study skills scale. To determine the number of factors to be extracted, eigenvalue, scree plot, and the percentage of variance explained were considered. The eigenvalue refers to the total amount of variance brought about by a factor in measuring the construct. In this study, the eigenvalues of 1

or greater (Plichta & Kelvin, 2013) was taken as a standard. The scree plot is a graphical representation of all possible factors within a construct. The number of factors to be retained is decided by identifying the sharp break which marks the upward move. The percentage of variance explained refers to the cumulative weight of a number of factors in explaining the construct. The general thumb's rule is that the retained factors should at least account for a total variance of 40% (Plichta & Kelvin, 2013). While extracting factors, varimax rotation was used to reveal dimensions underlying each study skills scale. Subscales created were named considering the nature of their items.

In order to determine levels of students' study skills in identified subscales, descriptive statistics were used through measures of central tendency and dispersion including maximum, minimum, mean and standard deviation. Subscales were created using the SPSS 'Transform-Compute variable' function by summing up scores for all items making up each factor. The minimum score was calculated by multiplying the number of items by one, because the research items were scored on a five-point Likert scale. Equally, the maximum score was obtained by multiplying the number of items by five. Maximum scores served as a baseline to interpret results from descriptive analysis. Descriptive statistics were calculated drawing on newly computed subscales and results.

Data from focus group interviews were audio-recorded, transcribed and analyzed thematically through data coding and categorization. The technique helps to examine factors influencing students' study skills. After analysis of both quantitative and qualitative data, all results were presented in a narrative way and in form of tables and figures; then, they were discussed and a conclusion was drawn.

1.8. 9 Ethical considerations

The RNP Inspector General, through the NPC Commandant as well as UR- CE research directorate granted permissions to conduct the study. Moreover, the oral informed consent was gotten from respondents in both quantitative and qualitative data collection methods, after providing sufficient information about the purpose, requirements, procedures, risks and benefits of participating in the research.

1.9 Structure of the work

There are six chapters in this thesis. The first chapter gives a broad overview of the research. It presents the study's background, states the research problem, defines research objectives and questions, describes the significance of the study, displays the historical context of study skills, clarifies the theoretical perspectives related to the study, explains the research methodology and presents the structure of the work. The second chapter is a published peer reviewed paper about levels of students' study skills. The third chapter is a published peer reviewed paper on variability of students' study skills in relation to their demographic characteristics. The fourth chapter relates to the published paper on psychometrics of the study skills' questionnaire. The fifth chapter is a manuscript on factors shaping students' study skills. The thesis ends with a general conclusion.

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Chapter II: Levels of students' study skills

This chapter corresponds to the original manuscript of article 1 published by Springer in Interchange journal in 2019. The paper aims at finding out the extent to which students self-report their conversancy with the investigated study skills namely time management, note taking, reading, writing, test preparation, and test taking skills. It is available online: <https://doi.org/10.1007/s10780-019-09361-5>.

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Levels of Study Skills Among Undergraduate Students in Rwanda: The Case for the National Police College

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Abstract

The present study contributes to the existing literature on higher education in post-conflict contexts. It seeks to investigate the extent to which the University of Rwanda (UR) undergraduate students at National Police College (NPC) are conversant with major components of study skills mainly time management, note taking, reading, writing, test preparation, and test taking skills. The present study follows a cross-sectional design and was conducted among 398 students. Results show that overall students are moderately conversant with concerned study skills. It is also found that in all programs of study (Professional Police Studies—PPS, Law, and Computer Science with the option of Information Security) students fare better in time management but have difficulties in test preparation skills. The study recommends that educational policy makers and university managers should develop adequate strategies for improving students' skills at all levels. We argue that continued monitoring and reinforcement of students' study skills is critical to the success of higher education in Rwanda.

Keywords Study skills · Higher education · Rwanda · National Police College

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Introduction

The quality of study skills (good or poor) contributes significantly to success or failure in both academic and non-academic settings (Gurung 2005; Yahaya and Yalwa 2016). In other words, study skills are important not just for academic learning, but also for everyday life (Kerta 2007). They constitute an important set of transferable life skills that students will take beyond their education into new contexts or workplace. Moreover, a number of studies (e.g. Alika and Edosa 2012; Alibakhshi and Zare 2010; Maphosa et al. 2014; Nuthana and Yenagi 2009; Pepe 2012; Thamavithya 2011) reveal that poor study skills are among deep-seated causes of students' poor performance. Capable students at all grade levels may experience difficulties in school not because they lack ability, but because they lack good study skills (Shetty and Srinivasan 2014; Yahaya and Yalwa 2016). In other words, students might have not developed the skills and behaviors necessary to support comprehension of college-level content (Tennen and Hagar 2015).

In post-genocide Rwanda, there is a noticeable complaint and dissatisfaction about the quality of university graduates at the labor market (Gahiji 2015; Ministry of Finance and Economic Planning [MINECOFIN] 2013). According to Gahiji (2015), the vast majority of graduates from Rwanda higher learning institutions possess technical knowledge, but are ill-equipped for employment primarily because they are found wanting in terms of skills such as communication, critical thinking, capacity to deal with new problems, innovation, and functioning in multi-disciplinary teams. In addition, the Rwanda labor force is characterized by low skills and productivity (MINECOFIN 2013).

More importantly, there is evidence that students' academic performance in Rwandan higher learning institutions leaves a lot to be desired (Gahiji 2015; MINECOFIN 2013). The performance of students enrolled in various academic programs of the UR at NPC is no exception to this national situation. The grades of students within the PPS department (one of NPC academic programs) is a good case in point. For instance, over the academic years 2013–2014 and 2014–2015, the overall pass rate of all PPS students (from level one to level five) was 66% only (PPS Department Database 2016). This success rate suggests that the vast majority of students might have failed a good number of subjects. If students' poor academic performance is not addressed in a timely manner, higher learning institutions are unlikely to produce citizens capable of playing effectively their roles in the socio-economic development of Rwanda (Ministry of Education [MINEDUC] 2013).

With reference to study skills and the way students go about learning, which determine (among other factors) their academic performance, Herrmann et al. (2017) found a significant negative association between the surface approach and academic achievement. Many students with academic difficulties are not aware of “tricks of the trade” that are used by academically competent students when they study (Gettinger and Seibert 2002). Moreover, several lecturers often have stories to tell about students' poor performance in spite of teachers' innumerable efforts to clarify the teaching material. The same stories are noteworthy in higher

learning institutions in Rwanda. In fact, as lecturers in higher education at the UR particularly at NPC, we have been experiencing cases of students' failures and malpractices despite numerous efforts to teach the subject as clearly as possible and providing students with the support they needed most. This situation tends to suggest that students might have problems in how they study.

In this context, we felt that there is a need to investigate critically the levels of study skills of the UR students as one of the components of quality learning. Hence the present study seeks to answer the following question: To what extent are the UR undergraduate students at NPC conversant with major components of study skills mainly time management, note taking, reading, writing, test preparation and test taking skills?

It is hoped that the present research would provide better and deeper understanding about the diversity of UR students' study skills, which is critical to ensure quality education. In other words, a precise understanding of students' study skills will enable university managers to design appropriate educational interventions to address weaknesses in the identified areas. The present study follows a cross-sectional design. It is a quantitative study conducted among 398 students of Professional Police Studies (PPS), Law, and Computer Science with the option of Information Security programs. The article shows that students are moderately conversant with study skills under investigation. It is also found that in all programs students fare better in time management but have difficulties in test preparation skills.

The present article is divided into five sections. Firstly, general considerations on higher education in post-genocide Rwanda are provided. Secondly, each component of study skills is examined closely. Thirdly, the theoretical framework grounding the present study is briefly highlighted. The methodology informing the study is described in the fourth section. The fifth section is devoted to the presentation and discussion of key findings.

Literature Review

Higher Education in Post-genocide Rwanda

In Rwanda, higher education is one of the four main levels of the education system: pre-primary, primary, secondary, and higher education (MINEDUC 2013). After the 1994 genocide perpetrated against the Tutsi which destroyed the country's existing education system (EP-Nuffic 2015), education was among the government's public service priorities to be immediately re-established (Mbabazi 2013). The key motive is that in Rwanda the achievement of social and economic development objectives (as outlined in Vision 2020 and the Economic Development and Poverty Reduction Strategic Paper—EDPRS I and II) is seen to depend to a large degree on the growth of its valuable resource, i.e. its people who must be provided with opportunities to develop knowledge, skills, and attitudes to compete in the labor market (MINEDUC 2013). Importantly, higher education is considered as a primary tool for the Rwandan development since it drives the successful implementation of all development policies. It plays a key role in human capital development and provides research as

well as innovation prospects to support the social and economic transformation of Rwanda (MINEDUC 2008). Higher education is viewed as the source for citizens to develop the higher-level competencies needed to rehabilitate the threatening situation that exists in all sectors of the economy and eventually take the country to its aspired state (MINEDUC 2010).

Thus, since 1994, reforms and developments aimed at re-establishing the higher education system have been undertaken (Mbabazi 2013) and a lot has been achieved in building the quantity and quality of higher education in Rwanda so as to produce fit-for-purpose and internationally credible graduates (MINEDUC 2008). Rwanda's system of higher education has expanded and diversified rapidly in terms of access especially during the post-genocide period (Mbabazi 2013).

In Rwanda, higher education is provided by both public and private institutions (rapidly increasing), all of which under the jurisdiction of the Ministry of Education (EP-Nuffic 2015). The only higher learning public institution is the University of Rwanda (UR) established in 2013 as a result of the merger of existing public universities (EP-Nuffic 2015). Its creation aimed at making the UR a catalyst to drive forward quality reforms by improving quality assurance, consolidating the skills and expertise of academic staff, creating centres of excellence for teaching and research, and improving utilization of resources and facilities (MINEDUC 2013). Large reforms have also been introduced within the teaching and learning system including the adoption of the Bologna modular system and legalization of English as the language of instruction, which have strengthened the higher education in several aspects (Mbabazi 2013).

However, despite significant progress towards ensuring quantity and quality in higher education in Rwanda, it becomes critical to ensure the life relevance of higher education for current and future national, regional and global labor markets (MINEDUC 2013). In fact, current graduates do not seem to possess skills required to meet the country's needs. Noticeable skills gaps exist between the present graduates' competences and those needed to achieve the aspirations of Vision 2020. Many graduates lack competence and lifelong learning skills needed to be successful in the workforce and meet the employers' expectations (MINEDUC 2010; Mbabazi 2013). The private sector growth and competitiveness is constrained by low levels of productivity and skills (MINEDUC 2013). Some studies have pointed to significant challenges in the employability of higher education graduates in Rwanda (International Youth Foundation 2011). National and international evidence suggests that employers, both in the public and private sector, value very highly a common set of 'generic business' or 'catalytic' skills. These include good skills in communication (written and oral), problem-solving, teamwork, creative and critical thinking, and an understanding of how businesses work (MINEDUC 2013).

Based on these challenges, it is evident that higher learning institutions are called upon to significantly influence the achievement of the country's ambitious goals of transforming into a knowledge-based economy (Mbabazi 2013; MINEDUC 2013). Presumably, students are in a better position to help understand some aspects regarding their learning competencies and skills which do not feature the demands of the labor market. Indeed, within the teaching and learning process, there is a need to listen to students' perceptions in relation to how they study. Such an approach holds an

immense potential to positively impact students' academic and non-academic performance. Unfortunately, little research has been conducted on the perception of students' ways of studying in higher education in Rwanda. This article aims to fill this gap. It explores undergraduate students' study skills, which are part and parcel of the contributing factors to both academic and non-academic performance.

Towards an Understanding of Students' Study Skills

A skill is a learned activity, i.e. something you can develop through practice and reflection. To be 'skilled' is to be able to perform a learned activity well and at will (Cottrell 2013). Learning, like many other activities, involves a complex set of skills known as 'study skills' that require practice in order to become a good student (The Pennsylvania State University 2014).

Study skills or strategies should be understood as any cognitive, emotional or behavioral activity that facilitates storage, recalling and use of the learned materials (Alibakhshi and Zare 2010; Pepe 2012). Study skills encompass a wide range of covert and overt behaviors that students can perform before, during and after learning in order to retain and apply information presented in the classroom or at home (Kerta 2007; Shackebaei et al. 2015; Yahaya and Yalwa 2016). Smythe (2012a, b) considers study skills to be a collection of strategies and activities that can enable students to be more efficient in their learning. They include competencies associated with acquiring, recording, organizing, synthesizing, remembering, and using information (Gettinger and Seibert 2002; Kerta 2007).

Study Skills and Academic Performance

Study skills play an important role in influencing academic performance of university students (Mashayekhi et al. 2014; Rahim and Meon 2013; Shetty and Srinivasan 2014). Studies reveal that study skills have a significant relationship with the academic achievement of students (e.g. Alibakhshi and Zare 2010; Hassanbeigi et al. 2011; Mashayekhi et al. 2014; Rahim and Meon 2013; Pepe 2012). Higher achievers demonstrate good study skills compared to lower achievers (Fazal et al. 2012; Shetty and Srinivasan 2014). Students with good study habits achieve better grades and are more successful in their classes (Tennen and Hagar 2015). Research also shows that there is a correlation between poor study skills and increased rates of academic failures (Wolfe 2009). This is supported by Alibakhshi and Zare (2010) as well as Pepe (2012) who argue that unfamiliarity with efficient study skills plays a major role in students' academic failure. A student who has poor study habits may be deficient in any or all of the major components of study habits. Any deficiency will hamper a student's ability to master content or to demonstrate mastery of the content in class, resulting in a poor or failing grade (Tennen and Hagar 2015).

Moreover, a number of studies (e.g. Alike and Edosa 2012; Alibakhshi and Zare 2010; Maphosa et al. 2014; Nuthana and Yenagi 2009; Thamavithya 2011; Pepe 2012) reveal that poor study skills are among deep-seated causes of students' poor

performance. Capable students at all grade levels may experience difficulties in school, not because they lack ability, but because they lack good study skills (Shetty and Srinivasan 2014; Yahaya and Yalwa 2016).

Study Skills in Higher Education

One of the most important necessities in higher education systems is the development and reinforcement of students' study skills (Didarloo and Khalkhali 2014). The latter are especially critical to academic success in higher education given the independent nature of postsecondary education (Shetty and Srinivasan 2014). In fact, students' success in higher education is dependent on their ability to study effectively and efficiently (Magut 2012), because at this stage of learning, success lies largely in students' own hands and this responsibility increases with each level of study (Cottrell 2013).

However, as Cottrell (2013) indicates, this shift in emphasis can come as a surprise to many students and can catch many out. Additionally, the experience of being a student in higher education can be challenging because being in control of one's own learning is not an easy task (Cottrell 2013). It requires a range of personal skills and attributes to manage independent learning, to use time well, to interpret sensibly what is going on when studying seems difficult or motivation wanes, and to adapt strategies when current ones do not seem to deliver (Cottrell 2008).

In order to perform well in higher education, students need to develop a range of effective study skills and strategies including note taking, time management, critical thinking, library and research skills, structuring and writing essays, preparing presentations, revising for exams, etc. (Shetty and Srinivasan 2014). The possession of enhanced study skills will help a student become a more confident, effective, productive and intelligent person in both personal and professional lives (Magut 2012).

Over the past decades, extensive research has been conducted on undergraduate students' study skills, habits and strategies mainly in developed countries (e.g. Khurshid, Tanveer and Qasmi 2012; Mashayekhi et al. 2014; Oluwatimilehin and Owoyele 2012; Shetty and Srinivasan 2014; Thamavithya 2011). The vast majority of developing countries especially African nations (including Rwanda) are almost left at the margin, with the exception of very few studies conducted in Nigeria, Zambia, Zimbabwe and South Africa (e.g. Ayodele and Adebisi 2013; Maphosa et al. 2014). Hence, it is essential to investigate the status of study skills of undergraduate students in different cultures and contexts.

Basic Categories of Students' Study Skills

Some researchers approach study skills more broadly while others are more specific. In this regard, on the one hand, Gettinger and Seibert (2002), Gurung (2005), and Smythe (2012a, b) divide study skills into four main categories: repetition (or rehearsal-based), procedural (or organization-based), cognitive-based, and meta-cognitive study skills. On the other hand, Beierlein and Wade (2002) point out that basic study skills include time management, note taking,

reading, test taking, writing, research and critical thinking skills. Furthermore, Smythe (2012a, b) develops seven basic areas of study skills categorized in four sections: (i) reading and writing; (ii) listening and note-taking; (iii) memory and time management; and (iv) examinations. Additionally, Tennen and Hagar (2015) indicate that the major components of study habits are reading, listening, note taking, test taking and time management.

Drawing on typologies outlined above, the present article focuses on the following six study skills given their prevalence and recurrence: time management, reading, note-taking, writing, test preparation and test taking skills. This choice suggests that conducting an investigation of all study skills is beyond the scope of the present study. We, the researchers had to be selective, understandably. Other studies may investigate other study skills.

Time Management Skills

Time management as a study skill in higher education has attracted the attention of a good number of scholars (e.g. Allan 2010; Beierlein and Wade 2002; Nasrullah and Khan 2015; Shahabudin et al. 2010). Allan (2010) argues that time management involves not only organizing time into manageable sections that will allow students to complete all the tasks required by the university, it is also about having ample time for rest and relaxation, sports and other social activities. Furthermore, Allan (2010) clearly states that good time management is about being able to identify what you need to do and then set priorities.

Time is one of the most precious and most limited assets (Beierlein and Wade 2002) particularly in higher education. Effective time management is an essential component of the independent study expected in higher education (Shahabudin et al. 2010). Time management is therefore very crucial and may affect individual's overall performance and achievements (Nasrullah and Khan 2015). A number of studies show that time management is strongly related to academic performance where successful students are good time managers (Aduke 2015; Kaushar 2013; Miqdadi et al. 2014; Nasrullah and Khan 2015; Pehlivan 2013).

Research also shows that misuse of time is probably the most common form of sabotage that students use to undermine their attempts to study (University of Newcastle upon Tyne 2004). More often, students fail to utilize their time judiciously as expected (Aduke 2015) due to lack of clear purpose, distractions, interruption, lack of consistent organization, planning and definition of priorities (Miqdadi et al. 2014).

In order to become effective time managers, students have to identify short-term and long-term goals. They have to (i) get organized by keeping a to-do list (daily, weekly) for the semester; (ii) prioritize tasks by identifying the urgent ones, important tasks, the 'must do', 'need to do', and the 'nice to do'; (iii) organize study space and time with the right equipment and stationery; and (iv) set up as well as organize simple filing systems where to keep up-to-date about university emails, notice board, etc. (Allan 2010).

Reading Skills

Reading can be defined as the process of looking at and understanding the meaning of a piece of writing by interpreting the characters or symbols of which it is composed (Cobb 2007). Various studies show that there is a positive and strong relationship between reading habits and academic performance (Lukhele 2013; Owusu-Acheaw 2014).

However, research studies on postsecondary education reading and learning warn that most university students today adopt a surface approach to reading and learning as a result of employing non-university strategies to read academic texts (Hermida 2009). In fact, academic reading skills are different from leisure reading skills. Academic reading involves identifying new ideas, understanding different perspectives and developing your understanding about a particular topic (Allan 2010). This is the reason why in the reading process students have to use some techniques to help assimilate, understand ideas and retain the information more easily (O'Donoghue 2006).

There are different approaches that help students read effectively and stay focused on their studies (Allan 2010). Firstly, students have to read with a purpose. From the onset, the reading activity has to be directed towards a clear purpose: for instance, to explore and understand the subject in greater depth, to obtain specific information or to complete an assignment (Allan 2010). While reading, students have to be active by thinking about why they are reading and what they want to gain from the information source. Additionally, students have to choose the right time to read mainly at times when they are most ready to do it. They must work in the right and quiet environment and reduce distractions; they have to be selective in order to read in depth (Allan 2010).

Note-Taking Skills

Note-taking is a skill that is used by individuals almost every day and in different situations (Boyle et al. 2015). Particularly, it is one of the most important study skills for students (Sharifi et al. 2013). Notes are taken in an attempt to collect information from one source (spoken or written) and reproduce it in one's own words (Smythe 2012a, b). Making good notes is about identifying and selecting relevant information (University of Newcastle Upon Tyne 2004). At the university, students make notes from a variety of sources including lectures, seminars, tutorials, when working in groups, when planning and writing essays, on field trips and placements, when revising for exams, when reading books and/or journals, when watching television or a video, and when researching on the Internet (Allan 2010; University of Newcastle Upon Tyne 2004). Note-taking serves two distinct functions for students: external storage and cognitive encoding (Boye 2012). Notes serve as a place to keep knowledge and information for later review (external storage), and also serve a vital function in helping to write the information on the brain (Encoding of information) (Boch and Piolat 2005; Boye 2012). In this regard, students actually begin to learn

and memorize during note-taking particularly when engaged in deep comprehension (Boye 2012).

The body of research on note-taking reveals that in general taking notes in class and reviewing them later has a positive impact on students' learning. Research also shows that students recall more lecture material if they record it in their own notes (Nazari and Mahmoodi 2015). It has also been shown that students who take their own notes ultimately perform better on tests of recall and synthesis than those who do not take notes (Boye 2012). The academic literature also reveals that students' academic performance is significantly correlated with note taking (Muraina, Nyorere, Emanu and Muraina 2014).

Unfortunately, in higher education most frequently students' notes are often inaccurate or incomplete, especially when recording diagrams, figures, equations, and other crucial materials (Boye 2012). Furthermore, most students make limited use of techniques such as abbreviations, diagrams, and symbols that can increase their note-taking efficiency and improve their ability to record more information (Badger, White, Sutherland, and Haggis 2001; Sutherland, Badger and White 2002).

Boye (2012) describes how effective notes-taking should be organized before, during and after lectures. Before class, effective note-taking requires the student to be organized, by having everything needed to take notes. During lectures, students have to pay attention to cues from the instructor and prioritize information. They must also keep the notes brief by using abbreviations, acronyms, by shortening words to be written frequently, by writing key words and shortened phrases, and by using meaningful symbols when possible. Students have also to keep their notes organized. This can be done by using bullet points, indentations, numbering, outlines, or other graphic organizers (such as charts, matrices, lists, etc.), and by dating notes as well as adding page numbers. After class, students are required to review notes regularly; compare their own notes with classmates' for supplement and clarification purposes; identify concepts that are still confusing or unclear, and ask their teacher for assistance whenever need.

Writing Skills

Effective academic writing is crucial to every university student since much of the assessment that goes on at university is based, not only on what information students present, but also on how that information is presented in writing (Gonye et al. 2012). At university, students usually have to complete a variety of writing tasks during their studies, ranging from short essays to lengthy dissertations. This writing may be done either under exam pressure or as coursework (Bailey 2006).

In all programs of study and across all levels of study, students' capabilities as a writer are very important because writing is a process which helps to learn more deeply. When students are engaged in writing for their assessment tasks, they are engaged in a process of learning (University of Technology Sydney—UTS Business School 2014).

However, research demonstrates that students have various academic writing challenges. Students have serious problems in spelling, using appropriate forms of

adjectives, punctuation marks, use of tenses, recognizing passive voice and using relative pronouns and prepositions (Komba et al. 2012; Gonye et al. 2012). Students are also weak in word division skills, paragraphing, and the use of articles where none are necessary or the use of wrong articles altogether. In their writing, students face different challenges. These include, for instance, lack of clarity, uncertain or ambiguous expressions obscuring meaning, poor citation, and referencing (Gonye et al. 2012). Furthermore, a good number of students do not plan their essays, do not write several drafts, do not edit their essays, do not refer to the dictionary or other resources that have been consulted, and do not discuss their essays with other students, all of which lead to poor and ineffective writing (Gonye et al. 2012).

Test Preparation and Test Taking Skills

In delineating study skills, most reviewed studies incorporate test preparation skills into test-taking skills. The present study does not subscribe to such a perspective. Test-taking skills are cognitive skills that allow students to undertake any testing situation in an appropriate manner and to know what to do before, during, and after the test (Dodeen 2009). These skills help students translate their knowledge from classroom learning to answering and responding to questions. They are transferable skills (Sefcik et al. 2013), because once acquired, students may be able to use them across a variety of subjects and within different settings and conditions.

Test-taking skills are the most common evaluating method of academic performance of students in most of educational systems and academic institutions worldwide (Dodeen 2009). They impact upon their academic achievement (Dodeen et al. 2014). Some students do poorly in test because of the lack of test-taking strategies or the use of poor ones (Dodeen 2015).

Different studies indicate some effective test-taking strategies (e.g. Dodeen 2015; Maryland Community College 2003; Mohammadi and Abidin 2014). These include starting early to prepare for test, predicting test questions, getting ready for the test, respecting test rules and regulations, reading test instructions carefully, managing time effectively, and surveying all questions before responding. Effective test-taking also includes knowing the scoring policy, reading each question carefully, underlying key words and terms, working independently, knowing how to deal with different types of questions, attempting to answer every question, checking over the test before leaving examination room, and reviewing test questions immediately after leaving the room. These strategies help students increase their scores on tests through the effective use of their knowledge, time, and efforts. At the same time, these skills reduce test anxiety, improve students' attitudes toward tests and toward learning in general; in short, they improve student motivation (Dodeen 2009).

Although most reviewed studies incorporate test preparation skills into test-taking, in the present study we decided to investigate test preparation separately for clarity purposes. Thus, test preparation skills will focus on skills needed before taking the test while test-taking skills will focus on skills required during the actual test or exam.

Levels of Students Study Skills in Higher Education

A number of studies investigated study skills of undergraduate students and found that, on the one hand, students do not have good study skills (e.g. Kumar 2015; Shahidi et al. 2014; Pepe 2012; Somuah et al. 2014; Fereidouni and Cheraghian 2009; Shackebaei et al. 2015). Additionally, some studies (e.g. Shackebaei et al. 2015) found that preparation for examination had the minimum score. On the other hand, other studies revealed that undergraduate students have moderate study skills (e.g. Ezeala and Siyanga 2015; Didarloo and Khalkhali 2014; Nourian et al. 2010; Mashayekhi, et al. 2014; Dinçer and Akdeniz 2008; Sekar and Rajendran 2015). Didarloo and Khalkhali (2014) also found that students were better in time management, concentration and memory than in the other areas. Nourian et al. (2010) found that the mean score for time management was higher than that of other study skills. Therefore, the present article will speak to the existing literature on students' study skills.

Theoretical Framework

The present article on study skills among undergraduate students in Rwanda is based on both the Social Cognitive Theory propounded by Albert Bandura (1989), and the approaches to learning. Bandura's theory values personal efforts, peer support and further source of knowledge as critical for learning to happen and succeed (Bandura 1989). The argument is that psychosocial functioning is a result of vicarious, self-reflective and self-regulatory processes (Bandura 1986). Indeed in the present study, time management, note taking, reading, writing, test preparation, and test taking skills are definitely influenced by personal effort, social interactions, and other sources of knowledge. These in turn may influence the approach to learning, which leads to qualitative differences in how students approach or go about learning (Prosser and Trigwell 1999). Scholars such as Marton and Säljö (1997), Prosser and Trigwell (1999), Biggs (2012), and Herrmann et al. (2017) highlight that deep, surface and strategic (or achieving) approaches to learning are determined by students' intention for learning. Deep learning is for students whose intention is to understand; surface learners' intention is to memorise for assessment; while strategic/achieving students' intention is to score high. As research in this area developed further, the emphasis shifted from achievement motivation towards students' self-reported ability to manage and organise their learning (Entwistle and McCune 2004), and consequently the achieving approach was replaced by organised effort (Parpala and Lindblom-Ylänne 2012).

Methods

Research Design

The present article follows a cross-sectional design. This is the most popular form of survey design used in education. It is used by researchers to collect data, at one point in time, from a sample or the entire population of people about current attitudes and practices, opinions, behaviors, beliefs or characteristics (Cresswell 2012). In this study, quantitative data reflecting students' current practices of academic study skills were collected and analyzed. The idea was to investigate the extent to which UR undergraduate students at NPC are conversant with the major components of study skills mainly time management, note taking, reading, writing, test preparation and test taking. The cross-sectional survey design was used by a number of researchers in similar studies (e.g. Didarloo and Khalkhali 2014; Ezeala and Siyanga 2015; Nourian et al. 2010; Shahidi et al. 2014; Yahaya and Yalwa 2016).

Participants

The entire study population i.e. three hundred ninety-eight (398) undergraduate students of PPS, Law, and Computer Science with the option of Information Security of the UR at NPC participated in the present study because researchers found the population not too big to be sampled. The study engaged with students of the academic year 2016–2017 from year one to year four. Students were chosen as respondents chiefly because their opinion is nowadays considered as a necessary factor to evaluate quality education at universities (Hakim 2014). Both females and males were represented in the study although males (87.9%) outnumber females (12.1%). The low number of females might be explained by the long history of women discrimination in different political and socio-economic activities including education, not only in Rwanda but also elsewhere. In terms of age, young students (46.0% for the age group 18–24, and 43.2% for the age group of 25–34) are more represented than adult ones, i.e. between 35 and 45 years (10.8%). This implies that the great number of participants are in the normal range of studying at higher education (18–34 with 89.2%) and can provide information which is relevant to the present study. In relation to marital status, many respondents are single (78.4%) compared to married ones (21.6%). Concerning work experience, the great number of participants (79.6%) are lacking under this feature because half of them have not been formally employed at all (50.0%) while 29.6% have less than 5 years of work experience. With regard to the year of study, year 1, 2, 3 and 4 are represented with 26.9%, 24.6%, 26.1% and 22.4%, respectively. Furthermore, students who joined the UR at NPC being civilian are many (52.5%) compared to those who joined NPC being police officers (47.5%). This finding implies that majority of the participants are fresh students from high school and are familiar with study skills. Finally, with regard to programs of study, Law and Computer Science with the option of Information Security students have

Table 1 Scores for study skills scales

Study skills scale	Number of items	Maximum achievable score	Minimum achievable score
Time management	13	65	13
Notes taking	11	55	11
Reading skills	11	55	11
Writing skills	14	70	14
Test preparation skills	9	45	9
Test-taking skills	12	60	12
Study skills total	70	350	70

a high number of participants (34.7% and 33.9%, respectively) compared to PPS (31.4%).

Measures

Quantitative data were collected using a close-ended survey questionnaire which was developed and piloted by the researchers. Questionnaire items were adapted from different study skills inventories reviewed from various journal articles and colleges' websites including mainly those developed by Bajwa, Gujjar, Shaheen and Ramzan (2011); Sabbah (2016) and University of Houston-Clear Lake (2019).

The questionnaire aimed at investigating the level of students' study skills. It was a five-point Likert scale survey (never = 1, rarely = 2, sometimes = 3, often = 4, always = 5). It comprised six scales reflecting the major components of study skills: time management skills (13 items), notes taking skills (11 items), reading skills (11 items), writing skills (14 items), test preparation skills (9 items) and test-taking skills (12 items). Table 1 provides the minimum and maximum achievable scores for each scale as well as for the comprehensive scale named 'study skills total'.

The questionnaire was piloted to 95 undergraduate students of Forensic Science program in NPC. These students do not yet belong to UR because the program started later compared to other academic programs (PPS, Law and Computer Science with option of Information Security). Processes to include this new program in UR are still ongoing. The questionnaire (which is placed in the "Appendix 1") was refined based on answers obtained during the piloting phase.

Procedure

Permission to conduct the study was sought and obtained from the Inspector General of the Rwanda National Police through the Commandant of NPC. Similarly, informed consent was given by students involved in the study. The students were made aware of the purpose, requirements, as well as risks and benefits of participating in the research. Data collection took place at NPC in Musanze district during the second semester of the 2017 academic year from 1st to 12th May 2017.

Table 2 Reliability of scales

Scale	Cronbach alpha
Time management skills	0.776
Notes taking skills	0.789
Reading skills	0.785
Writing skills	0.868
Test preparation skills	0.724
Test taking skills	0.764

Table 3 Baseline for calculating poor, moderate and good students

Study skills scale	Maximum achievable score	50% of maximum score	75% of maximum score
Time management	65	33	49
Reading skills	55	28	41
Notes taking	55	28	41
Writing skills	70	35	52
Test preparation skills	45	23	34
Test taking skills	60	30	45
Study skills total	350	175	263

The researchers met students in their respective classrooms, distributed questionnaires and collected them after the session.

Data were analyzed using SPSS, version 25. The instrument used to collect data (i.e. the questionnaire) was found reliable because the reliability coefficient (Cronbach's Alpha) is found greater than 0.72 for all scales as evidenced in Table 2.

Findings

In the first instance, with regard to each set of study skills, we sought to establish the number of students with poor study skills (whose score is < 50% of the maximum achievable score), students with moderate study skills (whose score is between 50% and 75% of the maximum achievable score), and students with good study skills (whose score is > 75% of the maximum achievable score). This classification follows the logic of other studies conducted in the area of study skills such as Didarloo and Khalkhali (2014); Dinçer and Akdeniz (2008); Ezeala and Siyanga (2015); Fereidouni and Cheraghian (2009); Mashayekhi et al. (2014); Sekar and Rajendran (2015); and Pepe (2012). Given the number of items in each set of study skills, Table 3 provides the basis for calculating poor, moderate and good students.

Table 4 Classification of students according to their levels of study skills (N = 398)

Study skills scale	Poor frequency (%)	Moderate frequency (%)	Good frequency (%)
Time management	3 (0.8)	174 (43.7)	221 (55.5)
Reading	20 (5)	206 (51.8)	172 (43.2)
Note-taking	31 (7.8)	227 (57.0)	140 (35.2)
Writing	18 (4.5)	228 (57.3)	152 (38.2)
Test-preparation	5 (1.3)	241 (60.6)	152 (38.2)
Test-taking	2 (0.5)	151 (37.9)	245 (61.6)
Study skills total	5 (1.3)	205 (51.5)	188 (47.2)

Table 5 Levels of students' study skills

Study skills scales	N	Mean	SD	Min.	Max.
Time management skills	398	49.91	6.890	29	65
Writing skills	398	49.52	8.668	24	70
Test taking skills	398	47.14	6.101	19	60
Reading skills	398	39.83	6.379	20	53
Notes taking skills	398	38.54	6.988	19	55
Test preparation skills	398	33.11	4.962	20	45
Study skills total	398	258.05	30.950	161.0	337

Drawing on characteristics provided in Table 3, we calculated the number of students in each category. Table 4 provides the classification of students in the three categories, i.e. poor, moderate and good.

As Table 4 shows, overall, 188 students (47.2%) have good study skills; 205 students (51.5%) self-report to have moderate study skills; and only 5 students (1.3%) report to have poor study skills. We suspect that the low number of students with poor study skills in test preparation and test-taking might be due to 'social desirability effect' chiefly because we used a 'self-rating' battery. Students might have over-rated their skills in these two areas.

In the second instance, descriptive statistics were run to produce the mean, standard deviation, minimum and maximum values for each set of study skills. These statistics helped to determine the extent to which the UR undergraduate students at NPC are conversant with major components of study skills as presented in Table 5.

As Table 5 shows, UR students at NPC have moderate study skills because (except for test-taking skills) their obtained means are located in the region between 50% and 75% of their respective achievable maximum values: Time management skills (M=49.91, SD=6.89) with scores ranging between 29 to 65; writing skills (M=49.52, SD=8.668), with scores ranging between 24 and 70; notes taking skills (M=38.54, SD=6.988) with scores ranging from 19 and 55; and test preparation skills (M=33.11, SD=4.962) with scores ranging from 20 to 45. Surprisingly enough, although students demonstrate moderate test preparation skills, they 'self-report' slightly high levels of test taking skills (M=47.14; SD=6.101) with scores

ranging from 19 and 60. We again suspect that this inconsistency stems from social desirability effect where students wish to be perceived as 'good' in taking their tests.

The moderate scoring of students in study skills under investigation is confirmed by results of the scale 'study skills total' whose mean is 258.05 (SD=30.950) with scores ranging between 161 and 337. As can be seen from Table 3, clearly this overall score is located in the moderate zone which ranges from 175 and 263.

These data suggest that for nearly all investigated study skills, UR students at NPC seem not to have outstanding study skills because their means are far below their corresponding achievable maximum values. Neither do they have poor study skills because their means are far above their corresponding achievable minimum values. Therefore, overall, findings reveal that they have 'moderate' study skills.

However, Table 5 indicates that time management skills have the highest mean (M=49.91). They are followed by writing skills (M=49.52), test-taking skills (M=47.14), reading skills (M=39.83), notes taking skills (M=38.54), and test preparation skills (M=33.11). These findings imply that students are respectively better in time management, writing and test taking skills. The means of these three scales are pretty close; they are located between 47 and 49. It is worth noting that major areas of weaknesses in the study skills of students include notes taking, reading and test preparation skills where their means are between 33 and 39.

In short, findings show that students fare much better in time management (M=49.91) while the situation is rather worrying in test preparation skills (M=33.11). The reason for having a high mean score for time management skills might be explained by the fact that, in practice, all students live in the premises of NPC where they are governed by NPC regulations; they follow a well-defined official schedule. However, the institution might not be involved in developing or improving other study skills mainly test preparation skills. If students are ill-equipped to get prepared for their tests, in all likelihood this will lead to poor performance.

Discussion

The findings of this study indicate that for all investigated study skills (time management, notes taking, reading, writing, test preparation and test taking skills) the University of Rwanda students enrolled in PPS, Law and Computer Science with the option of Information Security programs within NPC (located in Musanze district in the Northern Province) do not have outstanding study skills. They have moderate study skills because their means are far from their corresponding maximum values. This finding is consistent with other studies (Didarloo and Khalkhali 2014; Dincer and Akdeniz 2008; Ezeala and Siyanga 2015; Fereidouni and Cheraghian 2009; Mashayekhi et al. 2014; Sekar and Rajendran 2015; Pepe 2012) which found that undergraduate students have moderate study skills. However, the findings are not in line with Somuah et al. (2014) who found that most of the study habits exhibited by the students are poor. Findings of the present study also contradict Shackebaei et al. (2015) where it was found that only a small proportion (10.9%) of students had good study skills.

Since the present study has found that students under investigation have moderate study skills, the implication is that modules or courses on effective study skills have to be designed and offered to all students preferably at the early stage, i.e. in year one. Furthermore, students have to be exposed to various learning activities and situations susceptible to improve their study skills. These learning activities may include receiving frequent course works/assignments requiring the absolute application of key study skills, and getting regular feedback from teachers and peers. Additionally, students have to be encouraged to discuss openly their study skills related problems with their teachers and peers, and possibly suggest workable solutions. Equally, they have to help each other in adopting good study skills and abandoning poor ones.

Even though students do not have high levels of study skills, results show that they are somehow good in time management because the mean for this scale ($M=49.91$) outranks the mean of other study skills. This finding corroborates with the findings of Nourian et al. (2010) as well as Didarloo and Khalkhali (2014) which show that students are better in time management than in other areas. On the other hand, results indicate that students possess poor test preparation skills as its mean is the lowest ($M=33.11$). This finding confirms that of Shackebaei et al. (2015) where preparation for examination is found to have the minimum score.

The fact that NPC students do not fare better in test preparation raises serious concerns and hence needs to be addressed with great care. When students are not well prepared for the exam, it is highly likely that they will experience increased stress and test anxiety. In some cases, they may engage in malpractices such as cheating. They may also fail or get low grades. This observation is supported by Bayram (2013) who found that inadequate preparation has negative effect on test performance, and that students who use good test preparation skills perform much better. The implication for this finding is that while helping students to develop and improve their study skills, particular emphasis must be placed on low ranking skills, i.e. test preparation skills, notes taking skills, and reading skills. In this regard, students have to be taught about effective notes taking, reading and test preparation; it is also desirable that students be encouraged to have regular readings about these study skills as suggested by a number of studies (e.g. Allan 2010; Boye 2012; Dodeen 2015; Mohammadi and Abidin 2014). In short, students need to be constantly reminded of the importance of those skills in their academic and non-academic life. Drawing on the theoretical framework on which the present study is based, findings suggest further research on the level of students' personal effort, social interactions, and other sources of knowledge while recommending a shift from surface and strategic approaches to learning towards deep learning.

Conclusion

Findings of the present study indicate that the study skills of PPS, Law, and Computer Science with the option of Information Security programs students at the University of Rwanda are moderate. Students are found to be respectively better in time management, writing and test taking skills. The identified major

areas of weaknesses in the study skills of the students include notes taking, reading and test preparation skills. This trend can endanger students' academic performance. Therefore, study skills manuals or courses for university students should be designed and implemented. It is also critical to organize continuous trainings for improving undergraduate students' study skills at all levels of study. Teachers should know that their primary responsibility is to develop, promote, improve and reinforce effective study skills with more emphasis on weak areas. Importantly, students should be aware that even though developing and improving study skills is a gradual and long-term process, it is also an individual endeavor. Drawing from findings of the present study, it is evident that improving and increasing students' awareness about study skills can be helpful. Therefore, policy makers and managers of universities should consider enhancing students' study skills.

The study attempts to provide relevant and accurate insights about levels of students on six major components of study skills. However, like other surveys, this study has limitations. Firstly, the study does not provide causes of weaknesses and strengths in study skills. Therefore, future studies are needed to explore factors shaping students' study skills. Similarly, other studies investigating undergraduate or postgraduate students' study skills in other Colleges of the University of Rwanda or even in Rwandan private higher learning institutions may be carried out to better provide an accurate image of how our students study. Secondly, the study setting was localized and only a limited number of participants were involved. It was conducted on university students who are at the same time police officers. Having a particular status and living in a particular environment different from other civilian students of the UR might have had a bearing on the results of the present study. This means that results cannot be generalized beyond the study sample except for populations with similar features. Thirdly, in the present study, data were collected using a self-report questionnaire; hence responses might have been biased due to social desirability reasons. Participants may have underestimated or overestimated their study skills behaviors.

Despite these limitations, findings of this study contribute significantly to the existing literature on the topic in higher education particularly in post-genocide Rwanda where undergraduate students are found to possess moderate study skills. Therefore, the identified areas of weaknesses can form the basis for designing intervention programs in study skills in Rwanda and countries with similar features.

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Compliance with Ethical Standard

Conflict of interest All authors declare that they have no conflict of interest.

Informed Consent Informed consent was obtained from all individual participants included in the study.

Appendix 1

Questionnaire for Students

This closed-ended questionnaire has two main parts: The first part deals with students' identification. Put a tick (✓) in a box corresponding to your gender, age, marital status, working experience before joining the UR at NPC, current year of study and program of study as well as your status before joining the UR at NPC. The second part is a five-point Likert scale survey (never = 1, rarely = 2, sometimes = 3, often = 4, always = 5) comprising six (6) scales related to the major components of study skills: time management skills (13 items), notes taking skills (11 items), reading skills (10 items), writing skills (14 items), test preparation skills (9 items) and test taking skills (12 items). The items are scored (measured) from 1 to 5. Assigning a 1 to a specific item indicates that you don't do the corresponding action, while a score of 5 indicates that you all the time do the action. Therefore, you are requested to indicate the extent to which you do or don't do each action by ticking (✓) in a box reflecting your opinion.

Identification

1. Indicate your:

- a. Gender: female ☐ male ☐
- b. Age: 18-24 ☐ 25-34 ☐ 35-45 ☐
- c. Marital status: Single ☐ Married ☐ Separated ☐
Divorced ☐ Widow/widower ☐
- d. Working experience before joining UR:
Zero ☐ < 5 ☐ 6- 10 ☐ 11- 15 ☐ over 15 ☐
- e. Current year of study:
Year 1 ☐ year 2 ☐ year 3 ☐ year 4 ☐
- f. Current Program of Study:
PPS ☐ Law ☐ Computer Science ☐
2. Before joining the program in which I study, I was
A police officer ☐ A civilian ☐

Questions on Study Skills

3. Time management skills	Never 1	Rarely 2	Sometimes 3	Often 4	Always 5
I make a daily plan of academic and personal activities					
I avoid activities which tend to interfere with my planned schedule					
I daily set goals for the amount of work I want to complete					
I regularly attend classes					
I arrive at classes and other meetings on time					
I study when I have rested, prepared, and have planned for it					
I have all study materials near me when I study					

I regularly review my class notes, even when a test is not imminent					
I start course works as soon as they are assigned					
I finish and submit course works on time					
I get enough time to do academic activities					
I get enough time to do personal activities					
I am satisfied with the way I use my time					
4. Note taking skills	Never 1	Rarely 2	Sometimes 3	Often 4	Always 5
I go to class prepared with anything I'll need to take notes					
I take notes during class lectures					
I take notes as I read my notes					
I take notes on supplementary reading materials					
When taking notes, I am able to identify and write down important points					
I am able to follow the lecture and classroom discussion while I am taking notes					
When taking notes, I put concepts in my own words					
I use abbreviations and symbols when taking notes					
After each class, I review and edit my notes systematically					
After taking notes, I check them against other students' notes to make sure I didn't miss any important details					
I have binder or folder where I organize my notes or any handout received during class					
5. Reading skills	Never 1	Rarely 2	Sometimes 3	Often 4	Always 5
Before I start reading in depth, I look over reading material quickly (or I briefly go through the chapters, headings and subheadings, pictures, charts, tables, maps, and graphs that I plan on reading)					
While reading, I formulate important questions and try to answer them					
When reading, I pay particular attention to underlined, bold and italicized words and phrases					
While reading, I can distinguish between important and unimportant points					
When reading, I make sure to read everything, including tables, graphs and illustrations					
When reading, I mark or underline parts I think are important					
When reading, I try to get the meaning of new words as I see them for the first time					
When reading, I try to connect things I have just read to things I already know					
I review reading material several times during a semester					

I summarize the reading material in my own words and take brief notes					
I am satisfied with my reading ability.					
6. Writing skills	Never 1	Rarely 2	Sometimes 3	Often 4	Never 5
I have a clear idea of what the lecturer requires for writing an assignment.					
I am comfortable using library resources for research (or When I am assigned a research paper, I know how to use library sources)					
I am comfortable using electronic resources for research (or When I am assigned a research paper, I know how to use electronic sources)					
I allow sufficient time to collect information, organize material, and write the assignment					
I write effective sentences and paragraphs, using correct grammar, punctuation, and spelling					
When writing an essay, I use a well-defined structure (introduction, body, and conclusion)					
When writing an essay, I provide in-text citations in the body of the work (sources of ideas and information)					
When writing an essay, I provide a reference list at the end of the work or footnotes					
When writing an essay, I make sure that all referenced materials at the end of the work or footnotes are cited in the text and vice versa.					
I review my writing for grammatical errors (Or I revise my writing to make it clear, correct, and consistent)					
I have someone else read my written work and consider their suggestions for improved writing					
I am able to express my thoughts well in writing.					
I am comfortable with my command of English grammar, punctuation, and spelling					
I am confident with my ability to write					
7. Test preparation skills	Never 1	Rarely 2	Sometimes 3	Often 4	Always 5
I study for examinations (quizzes, tests) several days before I take them					
When preparing for the exam, I strive to understand the learning material					
I understand the structure of different types of tests and I am able to prepare for each type.					
I try to find out what the exam will cover and how the exam is to be graded.					
I anticipate what possible questions may be asked on my tests and make sure I know the answers					
I can easily identify what I have learned and not learned before a test.					

I don't study hard the night before the exam					
I get a good night's rest prior to a scheduled exam					
I feel confident that I am prepared for the exam					
8. Test taking skills	Never	Rarely	Sometimes	Often	Always
	1	2	3	4	5
I survey the test before beginning					
I read the exam directions closely					
When answering, I start from simple to difficult questions					
I take care of marks allocated to each questions and answer accordingly					
I follow exam directions carefully when taking an exam					
I take time to understand exam questions before starting to answer					
I am calmly able to recall what I know during an exam					
I provide grammatically correct answers with good punctuation and spelling					
When taking an exam, I don't look toward other students' papers					
I review my answers and check my work to spot mistakes or questions overlooked.					
I am satisfied with the way I answer questions					
I complete the exam on time					

Adapted from Bajwa et al. (2011), University of Houston-Clear Lake (2019) and Sabbah (2016)

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Chapter III: Variability of students' study skills in relation to their demographics

This chapter relates to the original manuscript of article 2 published in South African Journal of Higher Education in 2021. It aims at identifying differences among undergraduates' study skills on the basis on their demographic features such as gender, age, marital status, working experience, level of study, and program of study. It is accessible online: <https://dx.doi.org/10.20853/35-4-4240>.

VARIABILITY OF STUDY SKILLS IN HIGHER EDUCATION: THE CASE OF RWANDAN UNDERGRADUATE STUDENTS AT THE NATIONAL POLICE COLLEGE

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ABSTRACT

This study extends knowledge production about students' study skills in higher education. It is intended to unpack variations among undergraduate students' study skills based on demographic characteristics. The article uses a comparative cross-sectional design drawing on a survey questionnaire distributed among 398 students of three programs of study at the University of Rwanda (UR), National Police College (NPC). These are Professional Police Studies (PPS), Law and Computer Science (CS) with the option of Information Security. Results indicate that students' features primarily gender, age, marital status, year of study, program of study and working experience are relevant categories to study skills. These features were found to have an effect on all study skills investigated except gender which influence test preparation and test-taking only. We argue that strategies for improving study skills at all levels of higher education should take cognizance of students' demographic features.

Keywords: study skills, variability, demographic features, higher education, Rwanda

INTRODUCTION

In higher education, students are expected to demonstrate a high level of success. However, students sometimes fall short of meeting this expectation (Green and Celkan 2011). Several studies (e.g., Ganyaupfu 2013; Nuthana and Yenagi 2009; Sabbah 2016) have identified

internal and external factors contributing significantly to the undergraduates' academic achievement. Internal factors are commonly related to students whereas external factors are correlated with students' external environment and are beyond students' control. Internal factors include personal conditions and characteristics as well as study skills. On the other hand, external factors are concerned with home, school, and teacher conditions (Alshammari et al. 2018). The present article deals with internal factors with a focus on study skills.

According to some scholars (e.g., Ganyaupfu 2013; Mashayekhi et al. 2014; Naqvi et al. 2018; Rahim and Meon 2013), study skills constitute one of the student-related factors affecting academic achievement. In the same vein, personal conditions and characteristics such as gender, age, marital status, level of education, employment status, students' intellectual ability, physical and mental health, and level of motivation have also been highlighted by several studies as student-related factors shaping their achievement at university (e.g., Alhajraf and Alasfour 2014; Christopher and Redempta 2016; Ganyaupfu 2013; Green and Celkan 2011; Rahim and Meon 2013). This study examines the interplay between study skills and personal characteristics.

The literature on undergraduate students' study skills is replete with studies focusing on the quality of students' study skills (e.g., Didarloo and Khalkhali 2014; Ezeala and Siyanga 2015; Kumar 2015; Naqvi et al. 2018; Shackebaei et al. 2015; Shahidi et al. 2014). Moreover, an extensive literature has been interested in establishing the relationship between undergraduates' study skills and demographic characteristics such as age, gender, departments, area of specialization, and levels of study (e.g. Bavi, Asilzadeh and Haghighi 2014; Didarloo and Khalkhali 2014; Ezeala and Siyanga 2015; Koki and Abdullahi 2014; Naqvi et al. 2018; Ogoemeka 2013; Yahaya and Yalwa 2016; Ossai 2012). It is noticeable that, in understanding the relationship between students' study skills and their demographic features, studies have come to different conclusions: while some studies confirm this relationship (e.g., Bulent, Hakan, and Aydin 2015; Khan 2016; Koki and Abdullahi 2014; Ossai 2012; Naqvi et al. 2018; Powell 2011; Tambawal 2011), others reject it (e.g., Ayodele and Adebisi 2013; Bavi et al. 2014; Dinçer and Akdeniz 2008; Ezeala and Siyanga 2015; Mushoriwa 2009; Sekar and Rajendran 2015). Hence, further research is needed to enrich, expand and, clarify this contested relationship.

Furthermore, while the vast majority of these academic works have been conducted in developing and developed countries, there is a dearth of such research in Rwanda. Also, research shows that previous studies combined in one study both variables, i.e., level and variability of students' study skills. We are of the view that a separate detailed study of each of these variables would provide deeper insights. With this in mind, we felt the requisite for

exclusively exploring the variability of study skills concerning demographic characteristics among undergraduates of the UR studying at the NPC in Musanze district, Northern Province. This college was chosen as a case to study chiefly because its entire student body comprises police officers contrary to other UR constituencies.

The present study aims at comparing UR-NPC undergraduate students' study skills based on demographic features including gender, age, marital status, working experience, year of study, and program of study. The study seeks to investigate how the study skills of UR undergraduate students at NPC vary with their demographic features, namely gender, age, marital status, work experience, year of study, and program of study. The study focuses on the following study skills: time management, reading, note-taking, writing, test preparation and test-taking skills. The choice of these study skills is based on their recurrence in the teaching and learning process.

The findings of this study are expected to contribute to a better and deeper understanding of variables likely to affect quality learning and teaching. They could also provide education policy officials and decision-makers with baseline information to consider while fostering quality education.

LITERATURE REVIEW

Study skills

Study skills, which are regarded as one of the utmost influences of students' performance at university (Ganyaupfu 2013; Rahim and Meon 2013), have been defined in various ways (Bulent et al. 2015). They are depicted as any cognitive, behavioral, or cognitive activity, enabling the retention, retrieval, and use of the learnt materials (Alibakhshi and Zare 2010; Pepe 2012). Study skills include abilities related to acquiring, organizing, recording, synthesizing, recalling, and using information (Gettinger and Seibert 2002; Kerka 2007). They comprise a variety of observable and non-observable actions that students are expected to accomplish before, during, and after learning to reminisce and use, in or out of class, the learnt material (Kerka 2007; Shackebaei et al. 2015; Yahaya and Yalwa, 2016). Moreover, study skills are considered as a set of strategies and activities allowing students to be well-organized and competent in learning (Smythe 2012). Drawing on these various definitions, the present study considers study skills as strategies applied by students to perform well at school and beyond.

Higher education and study skills in Rwanda

The government of Rwanda has emphasized the necessity to equip graduates with the

knowledge and skills needed to help the country realize its ambition of becoming a country with a knowledge-based economy (Tabaro 2017). One of the expected outcomes of the Second Economic Development and Poverty Reduction Strategy (EDPRS II) is to produce graduates who are ready for the labour market and equipped with essential skills termed “catalytic skills” (MINEDUC 2010). However, beyond these national aspirations, it is very important to ensure that higher education imparts skills relevant to current and future job markets at the national, regional, and global levels (MINEDUC 2013). Unfortunately, perhaps paradoxically, there is a public outcry that present-day graduates in Rwanda do not have the necessary skills to assist the country realize its goals. Several studies have found that graduates are not competent and do not possess enduring learning skills to help them perform well in their workplaces and meet the prospects of their employers (e.g., MINEDUC 2010; Mbabazi 2013).

Besides, research has indicated substantial challenges in the employability of graduates from Rwandan institutions of higher learning (MINEDUC 2010; Mbabazi 2013, International Youth Foundation 2011). This is worrying chiefly because the most basic element for securing a decent job, irrespective of sector or position, continues to be employability skills (International Youth Foundation 2011). The reluctance of private and public industries to employ graduates from Rwandan higher learning institutions is not surprising because shreds of evidences at the national and international levels show that employers attach great significance to “generic business” or “catalytic” skills (MINEDUC 2013).

Given these challenges, higher educational institutions in Rwanda are invited to greatly contribute to the attainment of Rwanda’s aspirations by improving students’ study skills. In the present study, space was created to record a student-based understanding of their learning skills. The assumption is that this approach is likely to shed light on some of the reasons underscoring the fact that present-day graduates lack essential skills for the job market. It is essential to hear from students on how they self-report their study skills because this greatly impacts their academic performance. Regrettably, limited research has been carried out in Rwandan higher education on how students perceive their ways of studying. This study aims to address this knowledge gap. More precisely, it deals with variations of study skills among undergraduate students based on their demographic characteristics.

Study skills and students’ demographic features

It has been shown that good study skills – in conjunction with other factors – constitute a variable responsible for superior academic performance (Ossai 2012). In this regard, students’ demographic features such as age, gender, marital status, and year of study have been found to interact with study skills to direct academic success (Asikhia 2010). Findings on the level of

study skills as a function of students' demographic features have been varying and sometimes contradictory as it is shown in what follows. The present study arguably sheds light on this controversy.

Study skills and gender

Various studies have shown that gender is an essential element in influencing study skills at the undergraduate level (Naqvi et al. 2018). Research found out that study skills varied with gender (e.g., Bulent et al. 2015; Khan 2016; Koki and Abdullahi 2014; Ossai 2012) where female students reported more effective study skills than males (Bulent et al. 2015; Khurshid, Tanveer, and Qasmi 2012; Ogoemeka 2013; Ossai 2012). On the other hand, other studies (e.g., Koki and Abdullahi 2014) revealed that male students had good study skills than females. Interestingly, some studies did not get any difference among the two sex groups in terms of their study skills (Ayodele and Adebisi 2013; Dinçer and Akdeniz 2008; Ezeala and Siyanga 2015; Mushoriwa 2009; Sekar and Rajendran 2015). These contradictory findings suggest that investigating gender as a relevant category to students' study skills in different contexts calls for further consideration. In this study, we answer the following question: to what extent and in what ways does gender influence students' study skills in higher learning institutions in Rwanda? How different is the support required for male and female students?

Study skills and age

Some studies (e.g., Ossai 2012; Powell 2011) show age-based differences in undergraduate students' study skills while others indicate no differences (e.g., Ezeala and Siyanga 2015). For Ossai (2012), study skills improve with age since adult students testify good study skills. Besides, Powell (2011) also indicated that students with 23 years of age and above reported using a deeper level of study skills more frequently than young students. The latter mainly embraced a surface level of study skills associated with academic failure. In this study, we explore ways in which students' age influences study skills in Rwandan higher learning institutions.

Study skills and marital status

Several studies conducted on variations in study skills among students show that there is little evidence on differences brought about by marital status. For example, Ezeala and Siyanga (2015) demonstrated that marital status does not affect undergraduate pharmacy students' study skills. On the other hand, the results of Tambawal (2011) revealed a significant difference where female married students registered effective study skills than the unmarried ones. These contradictory findings suggest that there is a pressing need to explore the role of marital status

instudents' study skills. The current study seeks to find out if single and married students self-report the same levels of study skills and the extent to which students' marital status affect their levels of study skills.

Study skills and year of study

Comparative studies on students' study skills in terms of year of study offer contradicting findings as well. For instance, Didarloo and Khalkhali (2014) found that discontinuous undergraduates (i.e., university students with a college teaching experience of two years and pursuing further education) had better scores than the continuous undergraduates (who had not yet accomplished their first degree). Moreover, according to Naqvi et al. (2018), students' study skills improve as they pass from one semester to another and years of study. With this in mind, particular attention has been placed on fresh students' study skills (Papa et al., 2016) to support them earlier in terms of developing their study skills to enhance their performance (Naqvi et al. 2018). On the other hand, Ezeala and Siyanga (2015) found no variations in students' study skills by year of study. The presence of a linkage between students' study skills in some studies and the absence of it in others suggests that this area calls for further investigation, which is partly the object of the present study. In other words, to what degree do students in Rwanda improve their skills in studying as they progress in their upper levels of studies? We aim to establish whether the year of study is a relevant category for study skills among Rwandan students in higher education.

Study skills and programs of study

Studies on the correlation between study skills and programs of study offer varying results. For instance, Sekar and Rajendran (2015) found no differences in the way science and art students study at an Indian university. Similarly, Bavi et al. (2014) indicated that there was no important difference in the study skills of nursing, midwifery, and surgical technologist students in the Faculty of Medical Sciences at Ahvaz Jundishapur University in Iran. However, Koki and Abdullahi (2014) found that undergraduate students' study skills varied with four faculties investigated: Arts/Education, Social and Management Sciences, Sciences, and Law. But, the study did not specify the degree of variability among those faculties. In the same vein, Bulent et al. (2015) findings established that undergraduates' study skills vary in terms of departments: Primary School Teaching, Computer Instructional Technologies, Pre-School Teaching, and Science Teaching at the College of Education, Yildiz Technical University at Istanbul in Turkey. The difference was witnessed in favor of the Primary School Teaching and Computer Instructional Technologies departments. Moreover, Pepe (2012) found that the two departments

had different study skills (Physical Education and Sports Teaching Department, and Classroom Teaching department) at Mehmet Akif Ersoy University, Burdur in Turkey. Physical Education and Sports Teaching students had more negative learning skills than those of the Classroom Teaching Department. According to Pepe (2012), this may be motivated by the fact that Physical Education and Sports Teaching students are often given aptitude tests like sports skills, and their program of study mostly comprises applied subjects related to sports while the curriculum of the Department of Classroom Teaching consists of theoretical subjects. If this is the situation elsewhere, how is the situation about Rwandan university students? In what ways do they register different levels of study skills in terms of their program of study?

Study skills and working experience

It is apparent from the studies we reviewed that students' study skills differ in their work-related demographics. Ezeala and Siyanga (2015) found that mature students with working experience (parallel participants) had better study skills than young students from high school (regular students) mainly in time management and writing skills. The study attributed this discrepancy to the fact that most of the parallel participants had more experience and were mature compared to regular students who had little or no clinical experience. In our study, we sought to investigate whether work experience is a relevant category to study the skills of Rwandan university students.

THEORETICAL REVIEW

The present study is grounded in the Social Cognitive Theory proposed by Bandura (1989). It is also located in the approaches to learning (Prosser and Trigwell 1999). For learning to take place and be successful, the theory of Bandura emphasizes individual aspects such as personal efforts, peer support as well as other sources of influences (Bandura 1989). The main idea is that individuals are influenced by psychological and social factors resulting from indirect or direct processes including self-regulatory and self-reflective processes (Bandura 1986). In this regard, study skills such as time management, note-taking, reading, writing, test preparation, and test-taking skills are certainly influenced by individual features, mostly individual efforts, societal environment, and other sources of stimuli.

In return, these individual features can impact students' approaches to learning, resulting in qualitative differences in how students learn (Prosser and Trigwell 1999). The way students approach their learning has been extensively studied by scholars such as Biggs (2012); Herrmann, McCune, and Bager-Elsborg (2017); Marton and Säljö (1996); Prosser and Trigwell (1999). These scholars pointed out three approaches to learning namely surface, deep, and

strategic/achieving, all of which are determined by the intention that the student has for learning. The student who intends to understand the subject will adopt a deep approach to learning; the student intending to satisfy the requirements for assessment or to reproduce the material presented will opt for surface learning. A student whose intention is to achieve high grades will embrace a strategic/achieving approach, which is driven either by the achievement motivation or the sense of responsibility. However, with continuous research in approaches to learning, it was found that, in a strategic approach, the determination to do well is not driven by an element of competition. On the contrary, the determination to do well is a typical feature of organized effort which is measured in terms of efficient organization of time management, studying, concentration, and effort (Entwistle and McCune 2004). Besides, Entwistle (2009) demonstrated that organized effort can also be used in a deep or surface approach to learning. Combined with a surface approach, the organized effort has served students well before entering university and may well still lead to satisfactory levels of performance early in a degree course. But later on, it will become increasingly ineffective as tasks and assessment criteria change. For example, when assessment requires an understanding of the material, only a deep approach combined with organized effort will be successful. Therefore, for Entwistle (2009), to address the imbalance in the reasons of failure advanced by some students accusing their universities or colleges of being responsible for their failure with poor teaching and inadequate supervision, some higher learning institutions have been introducing students to the idea of “responsible learning right” from the beginning of the course with a moral imperative to put sufficient time and effort into their independent learning. Students are then reminded that study organization, time management, effort, and sustained concentration are their responsibility (Entwistle 2009). Of course, lecturers have the duty and responsibility to help students learn. But in the end, it is the students who have to do the learning (Entwistle 2009). Hence, in this study, we consider the extent to which NPC students’ demographics impact their approach to learning.

METHODS

Research design

This study follows a comparative quantitative cross-sectional design. It seeks to compare students’ study skills on the basis of demographic features mainly gender, age, marital status, working experience, year of study, and program of study.

Participants

The total study population was 398 undergraduate students of PPS, Law, and Computer Science

with the option of Information Security of the UR at NPC. This population was not sampled because it was found not large. The concerned students were those of the 2016–2017 academic year from all years of study, that is, Year One up to Year Four. Students were mostly taken as respondents since their views are currently seen as important in assessing the quality of education offered in higher education (Hakim 2014).

As Table 1 shows, both male and female students were involved in this research even if males (87.9%) outweighed females (12.1%). The limited number of females might have roots in long-lasting history of women discrimination in various social, economic, and political domains in the Rwandan society. It is an indication that, in Rwanda, female students are fewer in higher education than their male counterparts. As Tusiime et al. (2017) argue, there is an underrepresentation of females in Rwandan public universities (31.1% of female against 68.9% of males) mainly because male students generally perform better than females at the upper secondary level which is the main factor determining admission to public universities.

Concerning age, the study engaged predominantly with young students (18–35 years) who represented 89.2 per cent. A limited number of students were aged above 36 (10.8% only), which suggests that in Rwanda, university students are predominantly young. In terms of marital status – the majority of participants were single (78.4%) in comparison to married students (21.6%). This finding reveals that university students in Rwanda are predominantly single. With regard to work experience, results show that half of the respondents (50%) did not have any work experience while 29.6 per cent registered less than 5 years of work experience. As for respondents' years of study, all four years of study are represented and their size is relatively the same. Lastly, for the program of study, the PPS has a lower number of students (31.4%) than Law (34.7%) and Computer Science students (33.9%). This unequal number may be due to institutional needs, students' preferences and background studies.

Table 1: Respondents' demographic features

Variable	Category	Frequency	Percentage (%)
Gender	Female	48	12.1
	Male	350	87.9
Age	18–24	183	46.0
	25–34	172	43.2
	35–45	43	10.8
Marital status	Single	312	78.4
	Married	86	21.6
Working experience before joining the UR (years)	Zero	199	50.0
	< 5	118	29.6
	6–10	49	12.3
	11–15	18	4.5

Variable	Category	Frequency	Percentage (%)
Year of study	Over 15	10	2.5
	Missing	4	1.0
	Year 1	107	26.9
	Year 2	98	24.6
	Year 3	104	26.1
Previous status before joining the UR	Year 4	89	22.4
	A police officer	189	47.5
	A civilian	209	52.5
Program of study	PPS	125	31.4
	Law	138	34.7
	Computer Science with the option of Information Security	135	33.9

Source: Primary data 2018

Measures

A self-reported questionnaire was administered to gather quantitative data. Questionnaire items were adapted from Bajwa et al. (2011); Columbia Basin College (2011); and Sabbah (2016). The questionnaire was a five-point Likert-type scale survey (1 = never, 2 = rarely, 3 = sometimes, 4 = often, 5 = always). It encompassed six scales linked to the key components of study skills under inquiry: time management skills (13 items), notes-taking skills (11 items), reading skills (10 items), writing skills (14 items), test preparation skills (9 items), and test-taking skills (12 items). The questionnaire was piloted to 95 undergraduate students of the Forensic Science program. These were NPC students but UR students yet as the program begun a little later than the previous programs and process of including them in UR programs is still ongoing. The questionnaire was polished drawing on the responses from the piloting stage.

Procedure

Authorization to carry out research at NPC was acquired from the Inspector General of the RNP through the NPC Commandant. Targeted students agreed to take part in the study after being informed about the purpose, requirements, and advantages of partaking in the study. Data were collected at NPC/Musanze District in the 2nd semester of the 2017 academic year, in two weeks from May 1st to 12th, 2017. The data collection process took place in students' respective classrooms where questionnaires were distributed, completed and collected the same day. Data entry and analysis were done using SPSS software version 25. The questionnaire was set referring to the research objective and was validated by all authors of this article before and after being piloted. The instrument was trustworthy with Cronbach's Alpha higher than .72 for all investigated scales as shown in Table 2.

Table 2: Reliability of scales

Scale	Cronbach Alpha
Time management skills	.77
Notes taking skills	.78
Reading skills	.78
Writing skills	.86
Test preparation skills	.72
Test taking skills	.76

FINDINGS

The present study is intended to establish whether students' study skills vary with their demographic characteristics namely gender, marital status, work experience, year of study and program of study. Drawing on descriptive statistics generated about study skills scales, inferential techniques including the independent samples t-test and the one-way ANOVA were employed to establish the variability of students' study skills.

Table 3:. Descriptive statistics about study skills scales

Study skills scales	N	Mean	SD	Min.	Max.
Time management skills	398	49.91	6.89	29	65
Writing skills	398	49.52	8.66	24	70
Test taking skills	398	47.14	6.10	19	60
Reading skills	398	39.83	6.37	20	53
Notes taking skills	398	38.54	6.98	19	55
Test preparation skills	398	33.11	4.96	20	45
Study skills Total	398	258.05	30.95	161.0	337

Study skills and gender

Results indicate that study skills varied in relation to gender where males ($M = 259.00$; $SD = 30.65$) did better than females ($M = 251.12$, $SD = 32.51$). In particular, a statistically significant difference was found between female and male students in their test preparation skills [$t(396) = -2.026$; $p < .05$] and test-taking skills [$t(396) = -2.874$; $p < .05$]. Concerning test preparation skills, male students reported slightly higher levels of study skills ($M = 33.29$; $SD = 4.903$) compared to their female counterparts ($M = 31.75$; $SD = 5.229$). Cohen's D score [1] shows that the difference is medium (.30). With regard to test-taking skills, male students also reported relatively higher levels of study skills ($M = 47.47$; $SD = 5.825$) in comparison to females ($M = 44.79$; $SD = 7.483$). Considering Cohen's D score, this difference is medium (.40). Conversely, there was no statistically significant difference between females and males ($p > .05$) and other study skills (i.e. time management, notes taking, reading, and writing skills). Overall, results

indicated a moderate difference between males and females in two types of study skills only, that is, test preparation and test-taking skills where males did better than females. This finding infers that male students are likely to achieve higher grades than their female counterparts. These findings suggest that while strengthening UR students' study skills at NPC, gender should be considered as a relevant category. In other words, an emphasis should be placed on female students particularly in two categories of skills, i.e. test preparation and test-taking abilities.

Study skills and age

Results indicate that, except for test preparation skills ($F(2, 395) = 2.374; p > .05$), there is a statistically significant difference between the three groups of age (i.e., 18–24; 25–34; and 35–45) in relation to the rest of study skills under investigation: time management ($F(2, 395) = 4.244; p < .05$); notes taking ($F(2, 395) = 6.541; p < .05$); reading ($F(2, 395) = 4.405; p < .05$); writing ($F(2, 395) = 16.063; p < .05$); and test taking skills ($F(2, 395) = 4.667; p < .05$).

As Figure 1 shows, young students (18–24 years) had lower levels of study skills ($M = 250.50$; $SD = 32.05$) than adult ones ($M = 264.40$; $SD = 28.17$ for the 25–34 age group, and $M = 264.79$, $SD = 30.131$ for the 35–45 age group). This situation may be attributed to the fact that the group of young students comprises mainly those in Year One. It can be assumed that these newcomers are still struggling to get acquainted with the academic jargon. This finding implies that young students mainly enrolled in Year One, deserve special attention to make improvements in how they study, and, by extension, in their academic achievement.

Study skills and marital status

The findings indicate that single and married students differed in their study skills, where married students did better ($M = 266.02$; $SD = 27.06$) than single ones ($M = 255.85$, $SD = 31.62$). A statistically significant difference was particularly observed in time management, notes taking, reading and writing skills. However, there is no statistically significant difference in their test preparation [$t(396) = -.685; p > .05$], and test-taking skills [$t(396) = -.732; p > .05$].

In terms of time management skills, married students showed a slightly higher level of study skills ($M = 51.65$; $SD = 5.790$) than single students ($M = 49.43$; $SD = 7.097$). However, the difference carries a moderate weight because Cohen's D score is medium (.34). In relation to notes taking skills, married students also had relatively higher levels of study skills ($M = 40.28$; $SD = 6.177$) than single students ($M = 38.06$; $SD = 7.130$). Considering Cohen's D score, the difference is medium (.33). Similarly for reading skills, married students had slightly higher levels of study skills ($M = 41.24$; $SD = 5.26$) than single ones ($M = 39.45$; $SD = 6.61$). However,

the difference is medium (.30) considering Cohen's D score. Furthermore, with regard to writing skills, married students also had higher levels of study skills ($M = 51.85$; $SD = 8.15$) than single students ($M = 48.88$; $SD = 8.71$). The difference is medium referring to Cohen's D score whose value is .35.

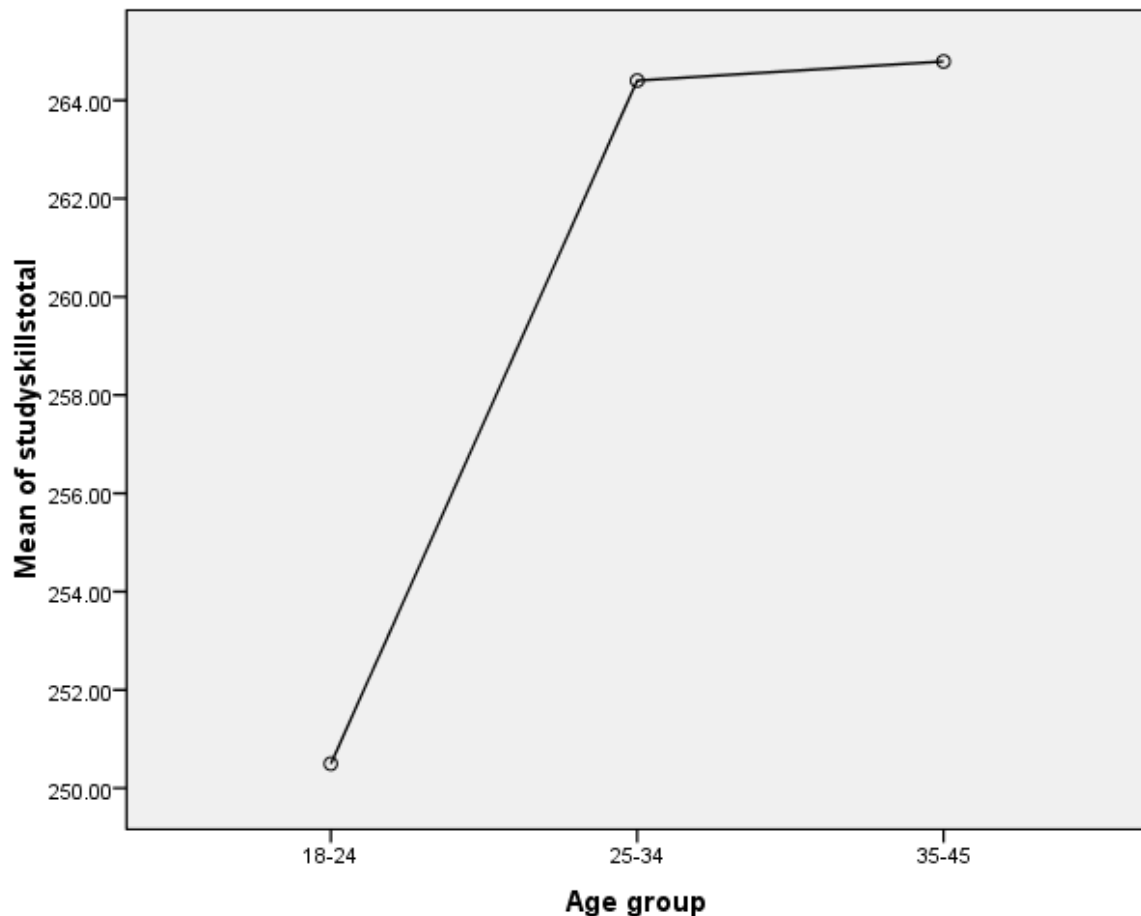


Figure 1: Means plot for total study skills according to age

Overall, it is seen that, according to students' marital status, there is a moderate difference in many students' study skills investigated (four out of six) i.e. time management, notes taking, reading, and writing skills. In other words, married students tend to possess slightly higher level of study skills than single ones. This finding implies that while improving students' study skills, single students must be given special support.

Study skills and working experience

The results indicate that, with the exception of test preparation skills ($F(4, 389) = .644$; $p > .05$), there is a statistically significant difference in study skills amongst the five categories of students in term of their work experience before joining the UR, that is, zero work experience, between 1–5, 6–10, 11–15, and over 15 years. Variances are observed in relation to time management ($F(4, 389) = 4.616$; $p < .05$), notes taking ($F(4, 389) = 4.822$; $p < .05$), reading ($F(4,$

389) = 2.937; $p < .05$), writing ($F(4, 389) = 5.424$; $p < .05$) and test-taking skills ($F(4, 389) = 1.619$; $p < .05$). Findings show that students who had over 15 years of working experience before joining UR had better time management skills ($M = 55.28$, $SD = 4.614$), note-taking skills ($M = 41.80$, $SD = 3.910$), and writing skills ($M = 54.40$, $SD = 8.695$) than the remaining categories.

However, students having between 11 and 15 years of experience registered better study skills than others in terms of reading skills ($M = 43.33$; $SD = 5.445$) and test-taking skills ($M = 49.00$; $SD = 6.417$). This difference could be attributed to the fact that these are mature students who were used to such transferable skills at the workplace. In addition, students, who did not have working experience before joining UR presented a lower level of study skills compared to others in time management skills ($M = 48.71$, $SD = 7.005$), note-taking skills ($M = 37.18$, $SD = 7.243$), reading skills ($M = 39.16$, $SD = 6.715$), writing skills ($M = 49.61$, $SD = 8.560$) and test-taking skills ($M = 46.54$, $SD = 5.672$).

In short, it was found that study skills vary according to the work experience of students before joining the UR in five out of six study skills investigated. Students who had more than 10 years of working experience had better study skills ($M = 275.01$; $SD = 26.650$) than those having no experience or having less than 10 years of working experience ($M = 258.22$; $SD = 29.240$). In other words, students who did not have work experience before coming to study at UR – NPC had a lower level of study skills than others. Thus, the results suggest that the work experience is a relevant category to student study skills. In the light of these results, it would be reasonable to suggest that, when strengthening students' study skills, particular attention should be directed to the identification and support of students with no previous work experience.

Study skills and year of study

The results show a statistically significant difference among the four years of study in all study skills investigated: time management ($F(3, 394) = 4.212$; $p < .05$), note-taking ($F(3, 394) = 13.577$; $p < .05$), reading ($F(3, 394) = 14.289$; $p < .05$), writing ($F(3, 394) = 43.661$; $p < .05$), test preparation skills ($F(3, 394) = 17.413$; $p < .05$) and test-taking skills ($F(3, 394) = 11.592$; $p < .05$).

As Figure 2 shows, students in Year Four have good study skills in all domains under consideration ($M = 277.89$; $SD = 24.01$). They are followed by year three ($M = 260.12$; $SD = 28.50$), then comes Year Two ($M = 253.69$; $SD = 28.50$). Year One students ($M = 243.52$; $SD = 31.79$) come last. This means that, as students advance in the year of study, their study skills improve because they get accommodated to academic life. In short, findings indicate unambiguously that study skills vary depending on the year of study because the difference was found in all study skills. This finding suggests that, while enhancing students' study skills, the emphasis has to be placed on first year students.

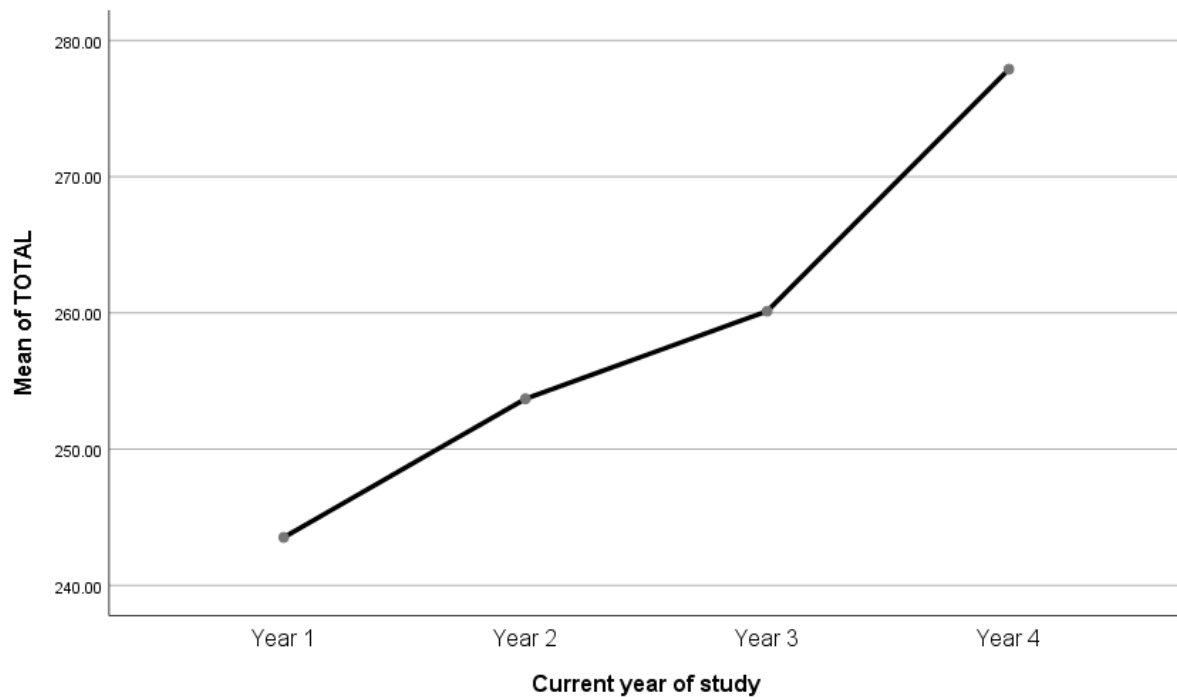


Figure 2: . Mean plot of total study skills according to level of study

Study skills and programs of study

The findings indicate differences in study skills in the three programs of study namely PPS, Law, and Computer Science with the option of Information Security. Concerning time management ($F(2, 395) = 7.404; p < .05$), note-taking ($F(2, 395) = 3.733; p < .05$), writing ($F(2, 395) = 13.681; p < .05$), test preparation ($F(2, 395) = 6.605; p < .05$) and test-taking skills ($F(4, 389) = 1.619; p < .05$), Law students fared better than their counterparts. However, there is no statistically significant difference in reading skills among the three programs ($F(2, 395) = 2.215; p > .05$).

For time management, there was a difference between Law and PPS, and between Law and Computer Science students. Undergraduate students from Law self-reported more skills in managing their time ($M = 51.53; SD = 6.12$) than PPS ($M = 49.78; SD = 6.37$) and Computer Science students ($M = 48.38; SD = 7.716$). Concerning note-taking skills, the difference was observed between Law and Computer Science, where Law students register higher skills in their habits of taking notes ($M = 38.22; SD = 6.78$) than CS students ($M = 37.55; SD = 7.99$).

There were also differences in writing skills between Law and PPS, Law and CS, and between PPS and CS. Law students had more writing skills ($M = 52.47; SD = 8.142$) than PPS ($M = 48.49; SD = 9.120$) and CS ($M = 47.44; SD = 7.96$). The difference was also observed in test preparation skills between (i) Law and PPS, and (ii) between Law and CS students. Law students reported high levels of test preparation skills ($M = 34.31; SD = 5.257$) than CS ($M =$

32.64; SD= 4.69) and PPS students ($M = 32.27$; $SD = 4.68$). For test taking skills, there were differences between (i) PPS and Law students; (ii) PPS and CS students; and (iii) Law and CS. In all cases, Law students self-reported higher levels of test taking skills ($M = 48.75$; $SD = 5.75$) than CS ($M = 46.69$; $SD = 5.76$) and PPS students ($M = 45.86$; $SD = 6.46$).

From these results, it is evident that study skills varied according to programs of study. Differences were found between all three programs of study and about five out of six areas. The overall findings indicate that Law students were better in study skills ($M = 267.24$; $SD = 27.58$) than PPS ($M = 253.46$; $SD = 30.56$) and CS students ($M = 252.89$; $SD = 32.59$) in all areas. Results also indicate that CS students self-reported low levels in study skills ($M = 252.89$; $SD = 32.59$) compared to PPS students ($M = 253.46$, $SD = 30.56$). This means that while improving students' study skills, special attention must be directed towards CS students.

DISCUSSION

The current study found that students' study skills vary depending on their age, marital status, work experience before higher education, year of study, and program. These findings are consistent with those observed in some earlier studies but also disagree with a few others. The findings in this study inform the theory and practice of learning in higher education.

Firstly, the results reveal that students' study skills moderately differ according to gender only in test preparation and test-taking skills where males do better than females but no difference was observed in time management, note-taking, reading, and writing skills. This result confirms other findings where undergraduates registered gender differences in study skills (e.g., Koki and Abdullahi 2014; Ogoemeka 2013; Ossai 2012). The results are also in line with other studies which did not establish any difference in the study skills of females and males (e.g., Ayodele and Adebisi 2013; Dinçer and Akdeniz 2008; Ezeala and Siyanga 2015; Mushoriwa 2009; Sekar and Rajendran 2015). The reason for this dual agreement might be because those studies did not provide precisions with regards to types of study skills as it is the case for the present study. Additionally, results of this study corroborate those of Koki and Abdullahi (2014), who found that males had better study skills than females. However, findings contradict the findings of Ossai (2012); Bulent et al. (2015); Khurshid et al. (2012), and Ogoemeka (2013) who found that female students reported more effective study skills than their male counterparts.

The fact that the findings of this study confirm some studies but contradict others is an indication that the relevancy of gender to study skills might be context-specific. In this study, the noticeable moderate difference in few study skills between males and females (test preparation and test-taking only) may be attributed to enormous efforts deployed by the

Government of Rwanda in order to promote girls' education at all levels. Thus, there is a need to devise strategies meant to eliminate the remaining gender disparities in test preparation and test-taking skills. More specifically, female students enrolled at UR in NPC deserve special care. Moreover, the moderate variance between males and females in two types of study skills only, that is, test preparation and test-taking skills where males did better than females, entails that male students are likely to achieve higher grades than their female counterparts. The academic results of 2016–2017 of PPS students (PPS Department database 2017) illustrate the implication. In fact, among the 76.6 per cent of PPS students who passed, 8 per cent were females against 68.6 per cent males. But study skills are not the only factors affecting female students' academic achievement. Tusiime et al. (2017) revealed other factors affecting female students in their academic pursuit including early motherhood, loss of parents or guardians, poor performance in A level examinations, family duties, and lack of counseling services related specifically to gender and gender stereotype.

Secondary, findings indicate that study skills vary with age because of a statistically significant age group difference (between 18–24; 25–34 and 35–45 years) in most of the study skills, that is, in five out of six study skills investigated. These results agree with Ossai's (2012) findings that demonstrated the contribution of age difference in students' study skills, but contradict Ezeala and Siyanga's (2015). The latter found no significant differences in students' study skills by age. The finding also contradicts Yahaya and Yalwa (2016) who found that students were not significantly different in most of the study skills by age group.

This confirmation and contradiction can be seen as an indication that the relevancy of age to study skills might be context-specific. The present study indicates that young students have a lower level of study skills than adult ones, which suggests that students' study skills improve as they grow old. The younger students' lower levels of study skills can be due to the fact that the group of young students comprises mainly those in Year One who are still struggling to get acquainted with the academic jargon. This finding implies that young students, that is, those aged 18–24 mainly enrolled in Year One, deserve special attention in order for them to improve the way they study, and, by extension, their academic achievement. The results of PPS academic year 2016–2017 (PPS Department database 2017) justify the need to support these young students. In fact, in Year One, 64.1 per cent passed; in year two 63.1 per cent passed; in year three 68.4 per cent passed, and in year four 70.1 per cent passed. Therefore, it is clear that their performance improves as they progress in their levels of studies. This demonstrates the urgent need to deal with students' study skills in their early years of studies in higher education because first year students take time to adjust to college life. Thus, they need skills that will enable them to study their lessons effectively.

Thirdly, the results show a moderate difference in study skills according to students' marital status in many students' study skills investigated (four out of six), that is, time management, note-taking, reading and writing skills. This finding agrees with Robert, Wooster, and Chen (2009) who indicate that there is a difference between study habits of married and unmarried students. A possible explanation for this situation may be that NPC married students are likely to focus on their studies because their responsibilities as heads of families oblige them to take their academic duties seriously in order to avoid disappointing their spouses and children in case of failure. Nonis, Hudson, and Philhours (2006) support the provided reasons that married students have a clear educational goal of supporting their family and, with that goal, they are determined to perform well and graduate. Most of the time, married students have other responsibilities in comparison to unmarried students and consequently have to be particularly well organized. Likewise, Meehan (2003) pointed out that married students are academically adjusted as a result of spousal backing and positive relationships leading to complete satisfaction in life. Besides, because of their maturity, married students are more determined to complete their schooling. Therefore, in terms of academic support, single students need more attention than their married counterparts. However, the finding contradicts that of Ezeala and Siyanga (2015), who concluded that there is no variance between students' study skills and their marital status. The context may have a big influence on marital status to be relevant for one's study skills.

The results of the current study also indicate that study skills vary according to the work experience of students before joining the UR as the difference was found in five out of six study skills investigated. The possible reason is that students who were employed as police officers before joining the UR were entrusted important responsibilities requiring them to apply some study skills such as managing their time as police officers, writing and reading reports, taking notes on criminal investigations, etc. This finding is similar to that of Ezeala and Siyanga (2015) who found that the parallel programme students had superior study skills than regular students. The same authors explained that the discrepancy was ascribed to the maturity and work experience of the parallel students. Similarly, the findings of Didarloo and Khalkhali (2014) agree with the present finding as they demonstrated that discontinuous undergraduates possessed effective study skills in comparison to continuous ones. The implication is that, firstly, study skills are important transferable skills that students need to possess to perform well, not only in school but also beyond. Secondly, students with no work experience should receive particular support about all study skills.

The findings further indicate unambiguously that study skills vary according to students' year of study because the difference was found in all study skills investigated. These findings

agree with the study of Didarloo and Khalkhali (2014) who indicated that students' study skills vary according to their academic level. However, this finding opposes Ezeala and Siyanga (2015) who did not find any students' study skills variations according to their level of study. Results show that Year Four students have good study skills, followed by Year Three, then Year Two, and lastly, Year One students. This means that, as students advance in the year of study, their study skills improve. Therefore, this finding indicates that while enhancing students' study skills, emphasis should be placed on first year students. These students are still struggling to adapt to academic life. Cook and Leckey (1999) argue that first year students lack self-regulatory skills that a higher learning institution requires because they are used to the planned and controlled milieu of secondary schools. This deficiency in regulatory abilities could end in creating adjustment problems at university. Abott-Chapman, Hughes, and Wyld (1992) clarify that students with inadequate study skills are susceptible to academic adjustment difficulties. Thus, attention has to be paid to study skills development not only in first year of studies but also in high school.

Furthermore, the study shows that study skills differ in terms of programs of study. Differences of study skills were observed in three programs of study, namely PPS, Law, and CS regarding the five out of six areas investigated. Other scholars voiced similar findings. For instance, Koki and Abdullahi (2014) revealed that undergraduates' study skills varied with faculties. Bulent et al. (2015), and Pepe (2012) also found variations in respect of departments. But the finding opposes Sekar and Rajendran's (2015) findings that arts and science students do not diverge in their study skills. This discrepancy among various study findings shows that the program of study is a relevant context-specific category to student study skills.

Lastly, the findings show that Law students possess a high level of study skills while CS students have low levels of study skills. This may be explained by the fact that the CS program has more practical than theoretical courses compared to Law and PPS students. These course do not call for the frequent use of some of the study skills such as note-taking, writing skills, and so on. Pepe (2012) also provides similar reasons that students studying in the Department of Physical Education and Sports Teaching register low level of study skills because they are frequently exposed to aptitude tests such as sports skills, with a program comprising mainly practical subjects compared to the department of Classroom Teaching that comprises of theoretical subjects. This means that among the three programs, CS students need more support in study skills as they reported poor study skills. While improving students' study skills, special attention should be directed towards CS students. This is because, even though some of the study skills may not be frequently used during their studies, they will need all of them once on the job market.

CONCLUSION

The results of this study indicate that the study skills of Law, PPS, and CS students at the University of Rwanda, National Police College vary according to their demographics in most of the study skills investigated. However, gender was found to affect test preparation and test-taking skills only. Therefore, continuous support in fostering undergraduates' study skills at all levels of study should take into consideration their demographic differences. It is desirable to raise awareness about students' differences in study skills. In this regard, policy makers and managers of institutions of higher learning should take into account demographic characteristics while enhancing undergraduate students' study skills.

The study tries to give a pertinent, accurate, and detailed understanding of the variability of undergraduate study skills concerning students' demographics. However, given its survey-based nature, this study has got some limitations. Firstly, the study does not give qualitative reasons for the identified differences. Therefore, a study which would investigate and analyse the factors shaping the variability of study skills is highly recommended. Secondly, the research area was limited and consequently a small number of the population was included. It was carried out among UR students who are also police officers. These have a social status and living conditions that differ from their colleagues. With this in mind, the results in the current study cannot be generalized to all the students of UR because not all of them display the same characteristics. Thirdly, the study used a self-reported questionnaire to collect data. Thus, responses might have been influenced by social desirability motives. Respondents might have overrated or underrated their actions.

Regardless of these concerns, the results of this study add great value to the prevailing literature on undergraduate students' study skills. More importantly, the differences identified would help designing intervention programs for improving study skills in higher learning institutions in Rwanda and beyond. The findings from this study demonstrate that study skills are influenced by students' demographics. Findings also inform us that there are qualitative dissimilarities in how students study and learn. Some students do not adopt a deep approach to learning and their learning efforts are not well organized. In other words, during their studies, some students are lacking in study skills. This may explain the widespread complaints that some graduates from higher learning institutions in Rwanda lack expected employability skills. The study also shows that studying at university is an art, and that students should be supported at all levels. The provision of support should take cognizance of students' demographic features.

NOTE

1. According to Cohen (1992), Cohen's $D = \frac{M_1 - M_2}{SD}$. M_1 = Mean of the 1st group; M_2 = Mean of the second group, and SD = Standard Deviation (when $SD_1 = SD_2$). In case $SD_1 \neq SD_2$, Cohen's $D = \frac{M_1 - M_2}{(SD_1 + SD_2)/2}$. Cohen provided that a small difference is $\leq .20$; medium difference is $\leq .50$ and large difference is $\leq .80$.

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Chapter IV: A psychometric analysis of students' study skills questionnaire

This chapter corresponds to the third manuscript published by Scientific Research Publishing in Creative Education in 2022. It needs to determine dimensions within the study skills questionnaire and demonstrate how students rate themselves in different subscales of study skills. The article is available online: [https://doi.org/ 10.4236/ce.2022.133057](https://doi.org/10.4236/ce.2022.133057).

A Psychometric Analysis of the Study Skills Questionnaire for University of Rwanda Undergraduate Students at National Police College

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Abstract

The current study investigated the structures and dynamics of the study skills questionnaire administered to 398 University of Rwanda (UR) undergraduate students studying in the premises of National Police College (NPC). Principal Component Analysis (PCA) and Confirmatory Factor Analysis (CFA) revealed that the investigated study skills scales (time management, notes taking, reading, writing, test-preparation, and test taking skills) are multidimensional. Time management, note taking and writing scales were found to have three factors while reading, test preparation and test taking have two factors. The study shows that students need more support in terms of time-planning, notes wording and polishing, content-reading strategies, referencing skills, psychological abilities in preparing tests and standardized attitudes before submitting scripts. The study recommends UR to elaborate the study skills handbook as a guide for students. It also recommends the provision of guidance and counselling services on the use of good study skills.

Keywords

Study Skills, Psychometric Analysis, Undergraduates, Higher Education, Rwanda

1. Introduction

Learning involves the use of proper study skills which are not innate abilities,

but are acquired, and fixed by repeated efforts (Oli, Hossain, & Rashid, 2019). A number of studies investigated levels of students' study skills in higher education (e.g. Ayodele & Adebisi, 2013; Somuah, Dankyi, & Dankyi, 2014; Didarloo & Khalkhali, 2014; Dinçer & Akdeniz, 2008; Ezeala & Siyanga, 2015; Fereidouni & Cheraghian, 2009; Kumar, 2015; Mashayekhi, Rafati, Mashayekhi, Rafati, Mohammadisardoo, & Yahaghi, 2014; Mukingambeho, Nzahabwanayo, Nzabwirwa, & Nizeyimana, 2019; Nourian, Mohammada, Mousari, & Nourian, 2010; Pepe, 2012; Sekar & Rajendran, 2015; Shackebaei, Siami, Firouzabadi, Memar, Rezaei, Hesari, & Afarangan, 2015; Shahidi, Dowlatkhah, Avand, & Mohammadi, 2014). However, these did not deepen their analysis to identify factor structures and determine how students are doing in different facets of study skills scales. Thus, the present study intends to fill in this knowledge gap by conducting a psychometric analysis of the study skills questionnaire administered to undergraduate students of UR at NPC. While levels of study skills provided a general overview of the layer of the land, the present study is a step further towards unpacking the possible structure underlying each study skill. At a later stage we demonstrate ways in which students fare vis-à-vis dimensions of each study skill set. Thus, this study targets to answering these two questions: 1) Are study skills scales under investigation (time management, notes taking, reading, writing, test-preparation, and test taking) uni-dimensional or multidimensional? 2) How do undergraduate students of UR at NPC rate themselves in the identified study skills dimensions?

The study concerns UR undergraduate students studying at NPC in Musanze district, Northern Province. Three programs of study namely Professional Police Studies—PPS, Law, and Computer Science with the option of Information Security were involved in the study. NPC was essentially chosen as a case to study because its entire student body comprises police officers contrary to other UR constituencies. Moreover, students were chosen as respondents because their opinion is nowadays considered as a necessary factor to evaluate quality education at universities (Hakim, 2014).

This study provides a psychometric tool to measure study skills of UR undergraduate students and possibly those from other higher learning institutions in Rwanda and beyond. Besides, the study highlights undergraduate students' strengths and weaknesses in their study skills. Hence, heads of higher education institutions in Rwanda, teachers, students, parents or guardians are provided with substantial information and insights to take adequate strategies for optimizing academic outcomes in higher learning institutions especially for undergraduate students.

2. Literature Review

2.1. Dimensions of Study Skills Scales in Higher Education

2.1.1. Dimensions of Time Management Study Skills

Several self-report instruments have been designed to measure different aspects of students' time management in higher education. For instance, Macan, Shahani, Dipboye and Phillips (1990) studied correlations of College students' time

management with academic performance and stress. Results of factor analysis revealed that time management scale consists of 4 independent factors: Factor 1 named setting goals and priorities with 15 items; factor 2 termed mechanics-planning, scheduling with 13 items; factor 3 labeled perceived control of time with 13 items; and factor 4 entitled preference for organization with 5 items. It is clear that [Macan et al. \(1990\)](#) saw time management as multi-dimensional with four dimensions.

[Britton and Tesser \(1991\)](#) also analyzed time management questionnaire while studying the effects of time management practices on College grades at the University of Georgia. Factor analysis of 35 items led to the adoption of 18 items with 3 subscales named short-range planning with 7 items, time attitudes with 6 items and long-term planning with 5 items. The results of [Britton and Tesser \(1991\)](#) illustrated that time management is also multi-dimensional with three factors: short-range planning, time attitudes, and long-term planning. Other recent studies analyzed time management questionnaire structure referring to Britton and Tesser's time management scale and came up with three factors bearing the names given by [Britton and Tesser \(1991\)](#). They include [Dahie, Osman and Mohamed \(2015\)](#), [Gayef, Tapan and Sur \(2017\)](#), [Al Khatib \(2014\)](#), [Mercanlioglu \(2010\)](#), [Nasrullah and Khan \(2015\)](#) and [Pehlivan \(2013\)](#).

[Razali, Rusiman, Gan and Arbin \(2018\)](#) determined the relationship between the time management and academic achievement of Malaysia University students. The factor analysis result of 20 items showed three main factors classified as time planning (8 items), time attitudes (8 items), and time wasting (4 items). Thus, time management was seen as multidimensional with three factors named time planning, time attitudes and time wasting.

Furthermore, [Rao and Azmi \(2018\)](#) made a confirmatory factor analysis of the time management scale originally developed by [Macan et al. \(1990\)](#) while developing and validating time management scale of faculty members of Higher Education Institutions in India. The study ([Rao & Azmi, 2018](#)) showed that time management is multidimensional with three layers: setting goals and priorities with 6 items, preference for organization with 5 items, and mechanics of time management registering 5 items.

2.1.2. Dimensions of Test Taking Study Skills

[Doreen \(2008\)](#) developed a scale of 31 items to assess students' test taking skills and estimated its psychometric indices at the United Arab Emirates University (UAEB). Using factor analysis procedure, the author extracted four factors: 1) before-test strategies with 8 items; 2) time-management strategies with 7 items; 3) during test strategies with 11 items and 4) after-test strategies with 5 items. The study of [Doreen \(2008\)](#) highlighted the multidimensional nature of test-taking with four layers: before-test strategies, time management strategies, during test strategies, and after test strategies.

[Zhang, Liu, Zhao and Xie \(2011\)](#) studied the use of English test-taking strategy and its effect on students' test performance at Tsinghua University, Beijing,

China. A factor analysis on the English Test-taking Strategy Inventory (ETSI) yielded six factors: 1) test-taking memory strategies with 7 items, 2) test-taking cognitive strategies with 16 items, 3) test-taking compensation strategies with 9 items, 4) test-taking metacognitive strategies with 42 items, 5) test-taking affective strategies with 3 items, and 6) test-taking social strategies (TSS) with 4 items. At this point we see again test taking skills proven to be multidimensional.

Biçak (2013) developed a “Test Preparation and Test Taking Strategies Scale” (TPTTS) to be used by high students preparing for the university selection examinations at national level at Bolu, Turkey. The prepared questionnaire had two main scales i.e. test preparation and test taking strategies with a total of 37 items. To detect the construct validity of TPTTS, exploratory factor and confirmatory factor analyses were applied. The study found that Test preparation strategies scale consists of three sub-scales of 17 items named cognitive strategies (7 items), social strategies (3 items) and metacognitive strategies (7 items) while test taking strategies scale gets four sub-scales of 20 items called item analysis strategies (7 items), time management strategies (4 items), choice prediction strategies (3 items) and after test strategies (3 items). The results of **Biçak (2013)** evidence that test preparation and test taking study skills are multidimensional.

It is clear that the reviewed literature is rich in studies which analyzed the dimensions of time management, test preparation and test taking study skills questionnaires. However, there is a paucity of studies which analyzed the dimensions of other study skills including note taking, reading, and writing study skills questionnaires. Further, the reviewed literature establishes that items measuring time management, test preparation and test taking study skills scales are multi-dimensional. However, most of them failed to demonstrate levels of students’ time management, test preparation and test taking skills in relation to the identified sub-dimensions. Thus, the present research intends to position itself towards confirming or rejecting the multi-dimensionality of time management, test preparation and test taking scales as well as note taking, reading, and writing study skills scales. Finally, the study seeks to indicate how students rate themselves in different study skills subscales, an area which was not explored by most reviewed studies. In other words, the present study seeks to enrich the literature around study skills questionnaire analysis and levels of students’ study skills in their different study skills subscales.

3. Methods

3.1. Research Design

This study follows a cross-sectional survey design. It unveils dimensions within the study skills questionnaire administered to UR undergraduate students of NPC and shows how students fare in different subscales of study skills under investigation.

3.2. Participants

The study engaged with undergraduate students of the UR studying in the pre-

mises of NPC located in Musanze district, Northern province. These were police officers living in a particular study environment and having a particular status comparing to other civilian students of the UR. The total study population was 398 undergraduate students of three academic programs i.e. PPS, Law, and Computer Science with the option of Information Security. In this study, we used a census for small populations and considered all 398 students for 2016-2017 academic year as research participants because the number was not too big to be sampled. Students of all years of study, i.e., from year one up to year four were involved in the study.

3.3. Measures

A self-reported battery was used to collect quantitative data. Questionnaire items were adjusted from [Bajwa, Gujjar, Shaheen and Ramzan \(2011\)](#); and [Sabbah \(2016\)](#). The tool was a five-point Likert-type scale survey (1 = never, 2 = rarely, 3 = sometimes, 4 = often, 5 = always). It included six scales related to key components of study skills under investigation: time management (13 items), notes-taking (11 items), reading (11 items), writing (14 items), test preparation (9 items), and test-taking study skills (12 items). Prior to larger data collection, the pilot study was done on 95 undergraduate students of the Forensic Science program. Although NPC students, participants to the piloting phase were not UR students. The questionnaire was refined basing on answers from the piloting phase.

3.4. Procedure

We secured the authorization to carry out research at NPC from the Inspector General of the Rwanda National Police (RNP) through the commandant of NPC. Respondents took part in the study after being explained the drive and necessities of participating in the study. Data were collected from May 1st to 12th in the 2nd semester of the 2017 academic year at NPC/Musanze District. Respondents answered the questionnaire in their respective classrooms and answers were collected the same day. Data entry and analysis were done using the software SPSS 25 and AMOS 25. The instrument was found reliable with the Cronbach's Alpha greater than .72 for all explored scales as per [Table 1](#).

Table 1. Reliability of scales.

Scale	Cronbach Alpha
Time management skills	.77
Notes taking skills	.78
Reading skills	.78
Writing skills	.86
Test preparation skills	.72
Test taking skills	.76

Source: Primary data, 2018.

3.5. Data Analysis: Factor Extraction

Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) techniques were used to analyze data. The EFA is a data reduction technique that helps classify a list of items into factors or clusters. Items in the same cluster (called “factor”) are usually related and can be named referring to their common features (Field, 2009). In this study, the EFA was conducted using Principal Component Analysis (PCA) to establish whether there are patterns of structures in each study skills set. On the other hand, the CFA is a technique meant to establish whether the structure provided by EFA fits the data. It shows the extent to which the established model fits the data; it measures good fit or poor fit (Byrne, 2013; Brown, 2015). The standardized measures used are presented in Table 2 below.

3.5.1. EFA Assumptions

While conducting EFA on the study skills, three assumptions were verified: the determinant, Kaiser-Meyer-Olkin (KMO), and Bartlett Test of Sphericity. The “determinant” is a measure of the absence or presence of multicollinearity (high levels of correlation between items). The KMO is an indicator of the sampling adequacy while the Bartlett Test of Sphericity gauges the strength of the bivariate relationship between items under investigation (Field, 2009; Plichta & Kelvin, 2013). The standard measures of these three assumptions are provided in Table 3.

Table 2. Standardized measures of CFA goodness-of-fit indices.

CFA goodness-of-fit indices	
Measure	Threshold
Chi-square/df (cmin/df)	<3 good; <5 sometimes permissible
P-value for the model	>.05
CFI	>.95 great; .90 traditional; >.80 sometimes permissible
GFI	>.95
AGFI	>.80
SRMR	<.09
RMSEA	<.05 good; .05 - .10 Moderate; >.10 bad
P CLOSE	>.05

Source: Byrne (2013) and Brown (2015).

Table 3. Standardized EFA assumptions.

Assumption	Standard
Determinant	>.00001
KMO	>.60
Bartlett Test of Sphericity	<.50

Source: Field (2009); Plichta & Kelvin (2013).

3.5.2. Extraction of Factors

The extraction of factors was performed to identify a number of dimensions that fit each study skills scale. To determine the number of factors to be extracted, eigenvalue, scree plot, and the percentage of variance explained were considered. The eigenvalue refers to the total amount of variance brought about by a factor in measuring the construct. In this study, the eigenvalues of 1 or greater (Plichta & Kelvin, 2013) was taken as a standard. The scree plot is a graphical representation of all possible factors within a construct. The number of factors to be retained is decided by identifying the sharp break which marks the upward move. The percentage of variance explained refers to the cumulative weight of a number of factors in explaining the construct. The general rule of thumb is that the retained factors should at least account for a total variance of 40% (Plichta & Kelvin, 2013). While extracting factors, matrix rotation was used to reveal dimensions underlying each study skills scale.

3.5.3. Descriptive Analysis

In order to determine levels of students' study skills in identified subscales, descriptive statistics were used through measures of central tendency and dispersion including maximum, minimum, mean and standard deviation. Subscales were created using the SPSS "Transform-Compute variable" function by summing up scores for all items making up each factor. Subscales created were named considering the nature of their items. Given that the study items were measured on a five-point Likert type scale, the minimum score was calculated by multiplying the number of items by one. Equally, the maximum score was obtained by multiplying the number of items by five. Maximum scores served as a baseline to interpret results from descriptive analysis. Descriptive statistics were calculated drawing on newly computed subscales and results.

4. Findings

4.1. Dimensions of Students' Study Skills

EFA Assumptions and CFA Goodness-of-Fit Indices for Each Study Skills Scale

The investigated study skills scales comprise different items (time management with 13, notes taking with 11, reading with 11, writing with 14, test preparation with 9 and test taking skills with 12 items). The task was to uncover possible dimensions (factors) within items of each study skills scale. While conducting EFA, the outputs indicate that all the assumptions are met as it is shown in **Table 4**, which is an evidence that there were latent dimensions within each study skills scale.

Table 4 shows that the EFA assumptions are met for all study skills scales because the obtained values for each scale satisfied the standardized measures. Basing also on both the scree plot and the rotation matrix, it was evident that each study skills scale was multidimensional with three dimensions for time management, notes taking and writing while reading, test preparation and test taking skills have two dimensions.

The structures were then submitted to CFA to establish whether they fit the data, i.e. to establish whether there is good fit or poor fit. Data obtained are summarized in **Table 5**.

As **Table 5** illustrates, the three or two dimensional models achieve the goodness-of-fit although the p -value of the Chi-square is significant for time management, notes taking, reading and writing. This might be attributed to the limited sample size ($N = 398$). The implication for these findings is that all the study skills scales are multi-dimensional as clarified by their rotation matrix, CFA multi-dimensional model and factor model structure presented and described below.

1) Time management study skills

Looking at the rotation matrix in **Table 6**, it is noticeable that the study skills time management has three dimensions. The 1st with 5 items, the second with 3 items and the third with 5 items. This is confirmed by the tri-dimension model in **Figure 1** below and the three-factor model for time management in **Table 7**.

2) Notes taking study skills

Basing on the rotation matrix in **Table 8**, it is evident that the study skills notes taking has three dimensions. Factor one has 5 items, factor two 3 items while factor three records 4 items as confirmed by the three-dimensional model in **Figure 2** and the three-factor model of notes taking in **Table 9**.

Table 4. EFA assumptions for each study skills.

SN	Study skills	EFA assumptions – obtained values		
		Determinant	KMO	Bartlett Test of Sphericity
1	Time management	.096	.81	.00
2	Notes takings	.099	.84	.00
3	Reading	.142	.83	.00
4	Writing	.007	.89	.00
5	Test preparation	.198	.77	.00
6	Test-taking	.107	.82	.00

Source: Primary data, 2020.

Table 5. Obtained CFA goodness-of-fit indices for each study skills.

SN	Study skills	CFA goodness-of-fit indices							
		Chi-square/df (cmin/df)	P-value for the model	CFI	GFI	AGFI	SRMR	RMSEA	P CLOSE
1	Time management	1.71	.000	.95	.96	.94	.04	.04	.81
2	Notes taking	2.017	.000	.95	.97	.94	.05	.05	.45
3	Reading	1.828	.001	.95	.97	.95	.04	.04	.65
4	Writing	1.623	.001	.98	.96	.94	.04	.04	.90
5	Test preparation	1.320	.148	.99	.98	.97	.03	.03	.91
6	Test-taking	1.343	.056	.98	.97	.96	.03	.03	.98

Source: Primary data, 2020.

Table 6. Rotation matrix: Loadings for time management.

Items	Factor 1	Factor 2	Factor 3
Getting time for personal activities	.823		
Getting time for academic activities	.770		
Satisfaction with the use of time	.660		
Having study materials when studying	.519		
Good time for studying	.456		
Respect of planned activities		.722	
Planning academic and personal activities		.695	
Setting goals		.676	
Class attendance			.734
Punctuality at class and meetings			.718
Starting doing coursework as soon as assigned			.491
Punctuality in submitting course works			.444
Regular review of class notes			.417

Source: Primary data, 2020.

Table 7. The three-factor model for time management

Factor 1: Time use or allocation	Regression weights
Qn6.12 Getting time for personal activities	.55
Qn6.11 Getting time for academic activities	.58
Qn6.13 Satisfaction with the use of time	.59
Qn6.7 Having study materials when studying	.56
Qn6.6 Good time for studying	.53
Factor 2: Planning of activities	Regression weights
Qn6.2 Respect of planned activities	.50
Qn6.1 Planning academic and personal activities	.60
Qn6.3 Setting goals	.62
Factor 3: Punctuality in academic activities	Regression weights
Qn6.4 Class attendance	.16
Qn6.5 Punctuality at class and meetings	.48
Qn6.9 Starting doing coursework as soon as assigned	.60
Qn6.10 Punctuality in submitting course works	.40
Qn6.8 Regular review of class notes	.63

Source: Primary data, 2020.

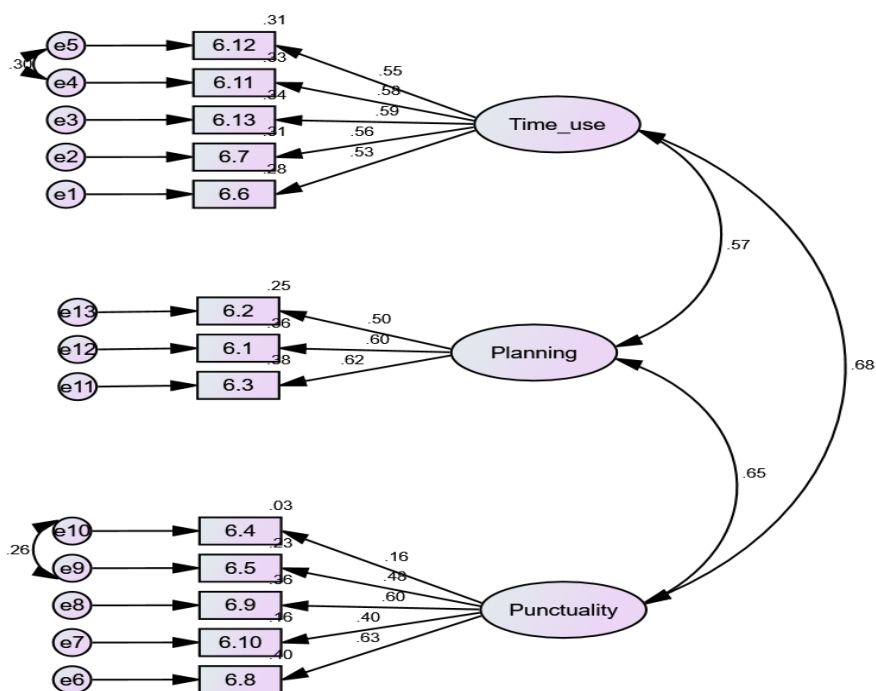


Figure 1. CFA time management: Tri-dimension model. Source: Primary data, 2020.

Table 8. Rotation matrix: Loadings for notes taking.

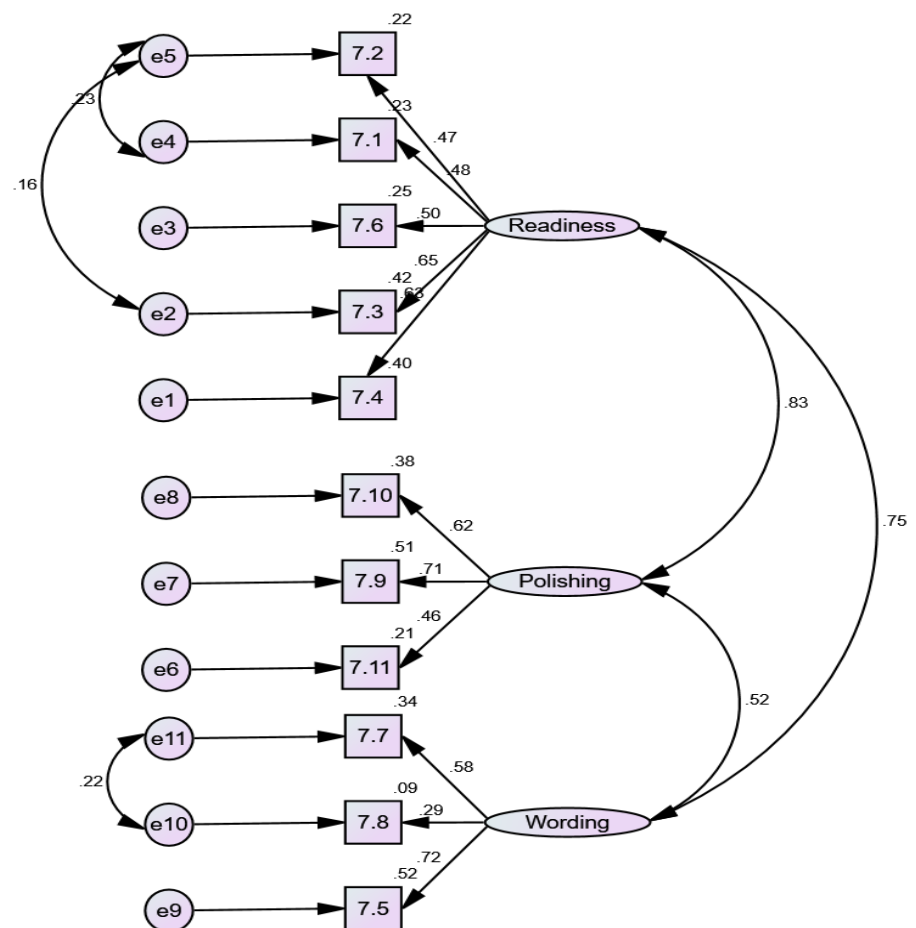
Items	Factor 1	Factor 2	Factor 3
Taking notes during lectures	.71		
Going to class with notes taking materials	.67		
Ability to follow lecture and class discussion while taking notes	.53		
Taking notes when reading notes	.50		
Taking notes on supplement readings	.50		
Checking notes		.78	
Notes review and editing		.72	
Notes organization		.55	
Putting notes in own words while taking notes			.78
Use of abbreviations and symbols			.68
Starting doing coursework as soon as assigned			.68
Identification of important points while taking notes			.61

Source: Primary data, 2020.

Table 9. The three-factor model for notes taking.

Factor 1: Notes taking readiness and abilities	Regression weights
Qn7.2 Taking notes during lectures	.47
Qn7.1 Going to class with notes taking materials	.48
Qn7.6 Ability to follow lecture and class discussion while taking notes.	.50
Qn7.3 Taking notes when reading notes	.65
Qn7.4 Taking notes on supplement readings	.63
Factor 2: Notes polishing	Regression weights
Qn7.10 Checking notes	.62
Qn7.9 Notes review and editing	.71
Qn7.11 Notes organization	.46
Factor 3: Notes wording	Regression weights
Qn7.7 Putting notes in own words while taking notes	.58
Qn7.8 Use of abbreviations and symbols	.29
Qn7.5 Identification of important points while taking notes	.72

Source: Primary data, 2020.

**Figure 2.** CFA notes taking: Tri-dimension model. Source: Primary data, 2020.

3) Reading study skills

Referring to **Table 10**, the study skills reading has two factors; factor one with 7 items and factor two with 4 items. The two dimension model in **Figure 3** and the two-factor model for reading in **Table 11** approve the findings too.

4) Writing study skills

Looking at **Table 12**, it is manifest that the study skill writing has three dimensions with 6, 3, and 5 respective items. This is confirmed by the tri-dimension model in **Figure 4** and the three-factor model for writing in **Table 13**.

Table 10. Rotation matrix: Loadings for reading.

Items	Factor 1	Factor 2
Getting meaning of new words while reading	.71	
Paying attention to underlined, bold and italicized words	.65	
Underling important parts while reading	.63	
Trying to make connections while reading	.54	
Surveying the reading material	.53	
Distinguishing important and unimportant points while reading	.47	
Reading everything in each paragraph	.41	
Frequent review of the reading material		.70
Summary of the reading material		.68
Satisfaction with the reading ability		.41
Formulation of questions		.61

Source: Primary data, 2020.

Table 11. The two-factor model for reading.

Factor 1: Form-related reading strategies	Regression weights
Qn8.7 Getting meaning of new words while reading	.49
Qn8.3 Paying attention to underlined, bold and italicized words	.54
Qn8.6 Underling important parts while reading	.54
Qn8.8 Trying to make connections while reading	.57
Qn8.1 Surveying the reading material	.48
Qn8.4 Distinguishing important and unimportant points while reading	.54
Qn8.5 Reading everything in each paragraph	.48
Factor 2: Content-related reading strategies	Regression weights
Qn8.9 Frequent review of the reading material	.58
Qn8.10 Summary of the reading material	.52
Qn8.11 Satisfaction with the reading ability	.65
Qn8.2 Formulation of question	.56

Source: Primary data, 2020.

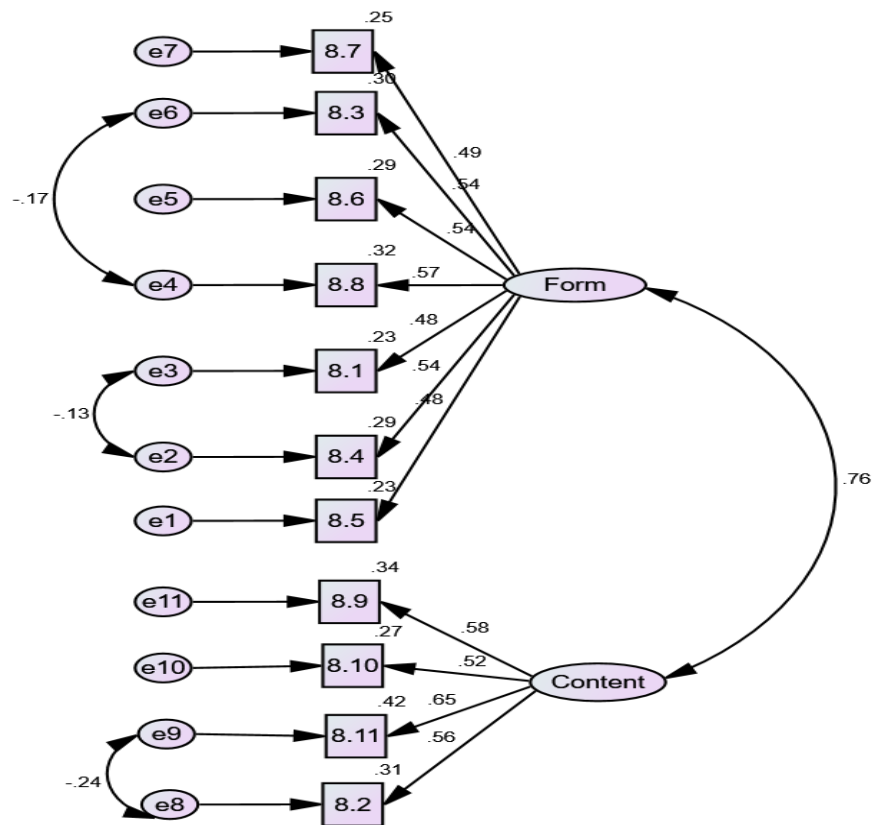


Figure 3. CFA reading: Two-dimension model. Source: Primary data, 2020.

Table 12. Rotation matrix: Loadings for writing.

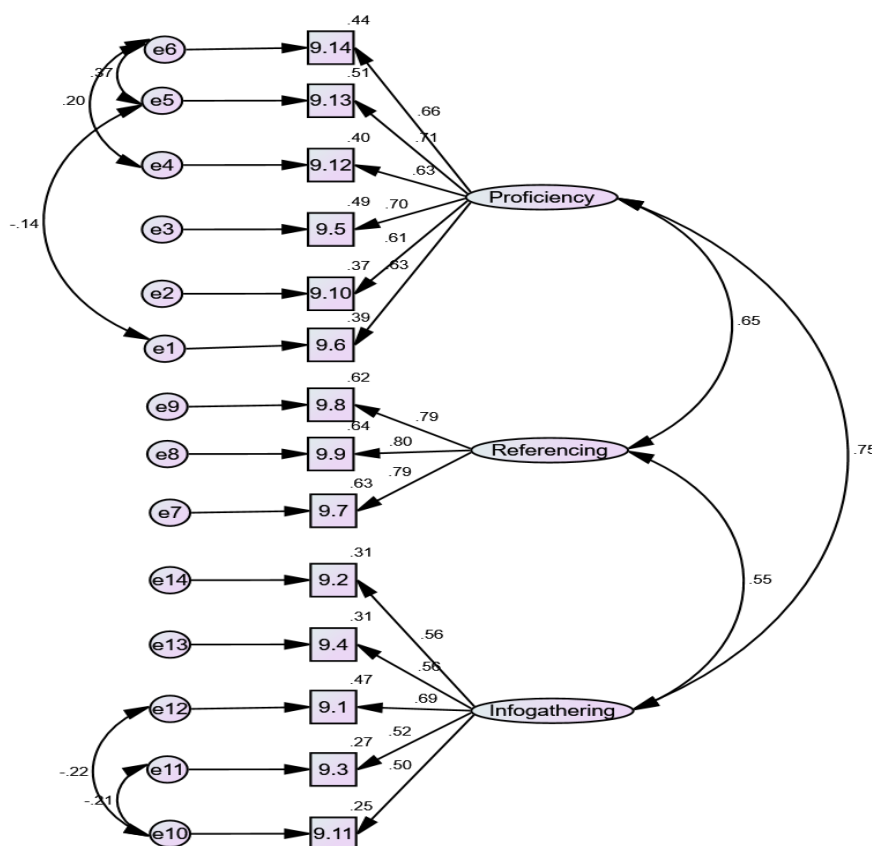
Items	Factor 1	Factor 2	Factor 3
Confidence in writing ability	.85		
Comfortability with English grammar, punctuation and spelling	.81		
Having ability to express thoughts in writing	.68		
Use of correct grammar	.67		
Review of written essay for grammatical errors	.48		
Use of well-defined structure while writing an essay	.44		
Provision of reference list		.85	
Making sure both in-text and end referencing are there		.81	
Provision of in-text referencing when writing an essay		.80	
Comfortability using library resources for research			.75
Allowing sufficient time for information collection			.70
Having a clear idea for writing assignment			.58
Comfortability using electronic resources for research			.54
Giving the written work to someone else for proof reading			.50

Source: Primary data, 2020.

Table 13. The three-factor model for writing.

Factor 1: Writing proficiency	Regression weights
Qn9.14 Confidence in writing ability	.66
Qn9.13 Comfortability with English grammar, punctuation and spelling	.71
Qn9.12 Having ability to express thoughts in writing	.63
Qn9.5 Use of correct grammar	.70
Qn9.10 Review of written essay for grammatical errors	.61
Qn9.6 Use of well-defined structure while writing an essay	.63
Factor 2: Referencing skills	Regression weights
Qn9.8 Provision of reference list	.79
Qn9.9 Making sure both in-text and end referencing are there	.80
Qn9.7 Provision of in-text referencing when writing an essay	.79
Factor 3: Information gathering abilities	Regression weights
Qn9.2 Comfortability using library resources for research	.56
Qn9.4 Allowing sufficient time for information collection	.56
Qn9.1 Having a clear idea for writing assignment	.69
Qn9.3 Comfortability using electronic resources for research	.52
Qn9.11 Giving the written work to someone else for proof reading	.50

Source: Primary data, 2020.

**Figure 4.** CFA writing: Tri-dimension model. Source: Primary data, 2020.

5) Test preparation study skills

The rotation matrix in **Table 14** proves that the study skills test preparation has two factors with 6 and 3 respective items as supported by the two-dimension model in **Figure 5** and the two-factor model for test preparation in **Table 15**.

Table 14. Rotation matrix: Loadings for test preparation.

Items	Factor 1	Factor 2
Finding out the coverage of the exam	.68	
Understanding the structure of types of tests	.67	
Anticipating possible test questions	.67	
Striving to understand the material	.66	
Studying for an exam several days	.56	
Identifying learned and not learned material	.51	
Feeling confident of being prepared for an exam		.49
Getting a good night's rest prior to an exam		.85
Avoiding study hard the night before the exam		.81

Source: Primary data, 2020.

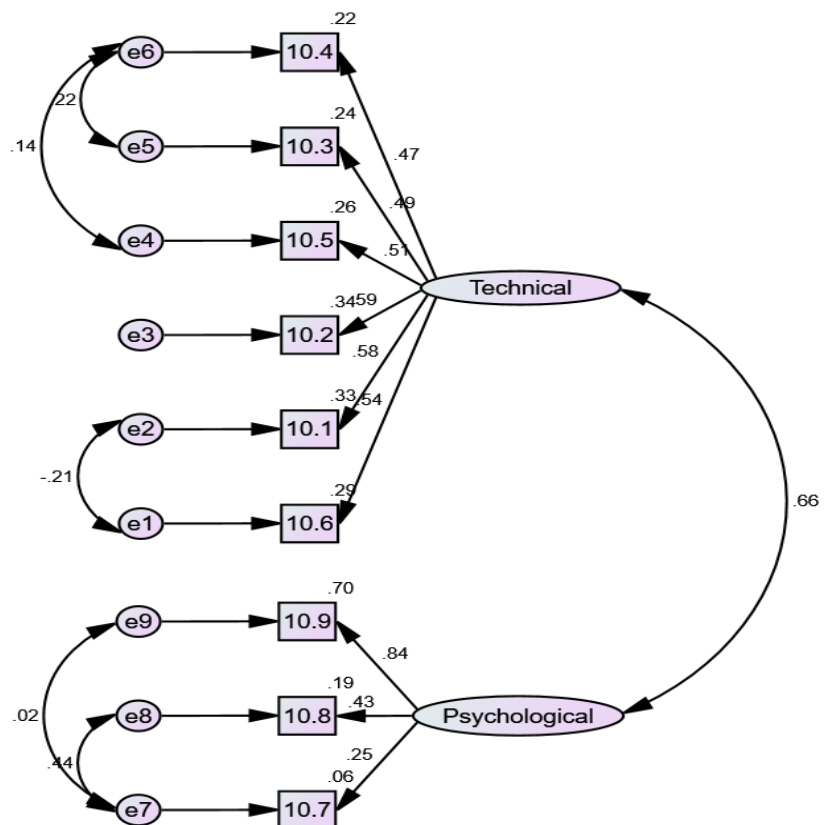


Figure 5. CFA test preparation: Two-dimension model. Source: Primary data, 2020.

Table 15. The two-factor model for test preparation.

Factor 1: Technical abilities	Regression weights
Qn10.4 Finding out the coverage of the exam	.47
Qn10.3 Understanding the structure of types of tests	.49
Qn10.5 Anticipating possible test questions	.51
Qn10.2 Striving to understand the material	.59
Qn10.1 Studying for an exam several days	.58
Qn10.6 Identifying learned and not learned material	.54
Factor 2: Psychological abilities	Regression weights
Qn10.9 Feeling confident of being prepared for an exam	.84
Qn10.8 Getting a good night's rest prior to an exam	.43
Qn10.7 Avoiding study hard the night before the exam	.25

Source: Primary data, 2020.

6) Test taking study skills

Table 16 exemplifies two factors for the study skills test taking with 7 items for the 1st factor and 5 items for the second factor. This is confirmed by its two dimension model in **Figure 6** and two factor model in **Table 17** below.

4.2. Levels of Students' Study Skills in Identified Subscales

In order to determine levels of students' study skills in identified subscales, descriptive statistics were used including minimum, maximum, mean and standard deviation. Sub-scales were named considering the nature of their items. Descriptive statistics for each study skills subscale are presented in different tables below.

As **Table 18** shows, students fare better in time-punctuality ($M = 21.02$; $SD = 2.75$) and time-allocation ($M = 17.51$; $SD = 3.78$). But problems are rife with time-planning ($M = 11.37$; $SD = 2.36$). Time-planning involves study skills such as respecting planned activities, planning academic and personal activities, and setting goals. In the questionnaire, items related to time-planning read as follows: (6.1) I make a daily plan of academic and personal activities; (6.2) I avoid activities which tend to interfere with my planned schedule; and (6.3) I daily set goals for the amount of work I want to complete.

Table 19 indicates that, students are ready for taking notes ($M = 18.71$; $SD = 3.64$). But notes wording ($M = 10.71$; $SD = 2.40$) and notes polishing ($M = 9.11$; $SD = 2.76$) present problems. Notes wording involves study skills such as putting notes in own words, use of abbreviations and symbols as well as identification of important points while taking notes. In the questionnaire, items related to notes wording read as follows: (7.7) when taking notes, I put concepts in my own words (7.8) I use abbreviations and symbols when taking notes; and (7.5) when taking notes, I am able to identify and write down important points. Moreover,

items related to notes polishing are: (7.10) after taking notes, I check them against other students' notes to make sure I didn't miss any important details (7.9) after each class, I review and edit my notes systematically, (7.11) I have binder or folder where I organize my notes or any handout received during class.

Table 16. Rotation matrix: Loadings for test taking.

Items	Factor 1	Factor 2
Following exam directions carefully	.64	
Answering according to marks allocated to each question	.63	
Answering from simple to difficult	.63	
Surveying the test before beginning	.60	
Reading exam directions	.55	
Taking time to understand exam questions	.51	
Ability to recall knowledge during the exam	.45	
Satisfaction with the way of answering questions		.69
Provision of grammatically correct answers		.65
Completing the exam on time		.62
Reviewing answers and checking mistakes		.52
Avoiding looking toward other students papers		.46

Source: Primary data, 2020.

Table 17. The two-factor model for test taking.

Factor 1: Technical skills	Regression weights
Qn11.5 Following exam directions carefully	.61
Qn11.4 Answering according to marks allocated to each question	.51
Qn11.3 Answering from simple to difficult	.21
Qn11.1 Surveying the test before beginning	.44
Qn11.2 Reading exam directions	.41
Qn11.6 Taking time to understand exam questions	.66
Qn11.7 Ability to recall knowledge during the exam	.62
Factor 2: Checking attitudes before exam submission	Regression weights
Qn11.11 Satisfaction with the way of answering questions	.62
Qn11.8 Provision of grammatically correct answers	.67
Qn11.12 Completing the exam on time	.45
Qn11.10 Reviewing answers and checking mistakes	.54
Qn11.9 Avoiding looking toward other students papers	.30

Source: Primary data, 2020.

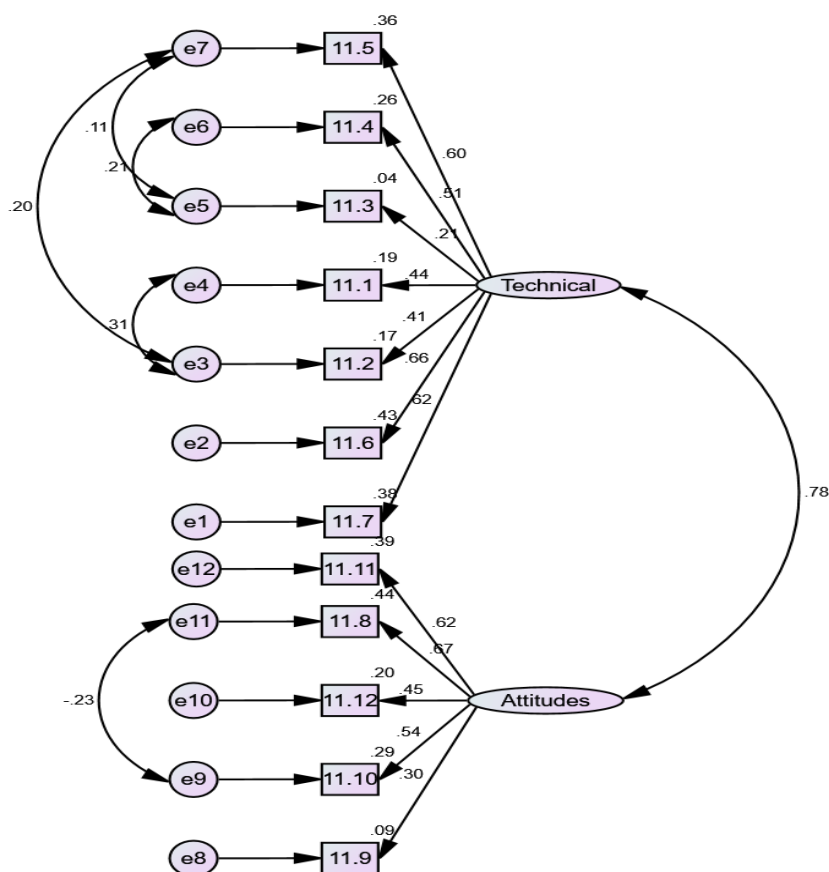


Figure 6. CFA test taking: Two-dimension model. Source: Primary data, 2020.

Table 18. Time management study skills subscales.

Subscales	Min.	Max	Mean	SD
Time-punctuality	12	25	21.02	2.75
Time-allocation	6	25	17.51	3.78
Time-planning	3	15	11.37	2.36

Source: Primary data, 2020.

Table 19. Notes taking study skills subscales.

Subscales	Min.	Max.	Mean	SD
Notes taking-readiness	9	25	18.71	3.64
Notes-wording	5	15	10.72	2.40
Notes-polishing	3	15	9.11	2.76

Source: Primary data, 2020.

Referring to **Table 20**, students are good in form related strategies ($M = 26.48$, $SD = 4.25$). But problems are rampant in content-reading strategies ($M = 13.35$; $SD = 2.97$). In fact, content-reading strategies involves study skills such as frequent review of the reading material, summary of the reading material, satisfac-

tion with the reading ability and formulation of questions. In the questionnaire, items related to content-reading strategies stand out as follows: (8.9) I review reading material several times during a semester; (8.10) I summarize the reading material in my own words and take brief notes; (8.11) I am satisfied with my reading ability and (8.2) while reading, I formulate important questions and try to answer them.

Table 21 displays that students fare better in writing proficiency ($M = 21.20$; $SD = 4.23$) and info-gathering skills ($M = 17.04$; $SD = 3.23$). But difficulties are predominant in referencing skills ($M = 11.28$; $SD = 2.98$). Referencing skills include study skills such as provision of reference list, making sure both in-text and reference list are there and provision of in-text referencing when writing an essay. In the questionnaire, items related to referencing skills read as follows: (9.8) when writing an essay, I provide a reference list at the end of the work; (9.9) when writing an essay, I make sure that all referenced materials at the end of the work or footnotes are cited in the text and vice versa; and (9.7) when writing an essay, I provide in-text citations in the body of the work (sources of ideas and information).

Table 22 clarifies that students fare better in technical abilities ($M = 22.84$; $SD = 3.50$). But difficulties are found in their psychological abilities ($M = 10.26$; $SD = 2.54$). Indeed, psychological abilities comprise study skills such as feeling confident of being prepared for an exam, getting a good night's rest prior to an exam and avoiding study hard the night before the exam. In the questionnaire, items related to psychological abilities read as follows: (10.9) I feel confident that I am prepared for the exam; (10.8) I get a good night's rest prior to a scheduled exam; and (10.7) I do not study hard the night before the exam.

As **Table 23** shows, students seem to do better in their technical skills ($M = 26.46$, $SD = 3.95$) than their attitudes before submitting scripts ($M = 18.67$; $SD = 3.13$). Actually, attitudes before submission contains study skills such as satisfaction with the way of answering questions, provision of grammatically correct answers, completing the exam on time, reviewing answers and checking mistakes and avoiding looking toward other students' papers. In the questionnaire, items related to attitudes before submission of exams are: (11.11) I am satisfied with the way I answer questions; (11.8) I provide grammatically correct answers with good punctuation and spelling; (11.12) I complete the exam on time, (11.10) I review my answers and check my work to spot mistakes or questions overlooked and (11.9) when taking an exam, I don't look toward other students' papers.

Table 20. Reading study skills subscales.

Subscales	Min.	Max	Mean	SD
Form-reading strategies	14	35	26.48	4.25
Content-reading strategies	4	20	13.35	2.97

Source: Primary data, 2020.

Table 21. Writing study skills subscales.

Subscales	Min.	Max	Mean	SD
Writing proficiency	9	30	21.20	4.23
Info-gathering skills	9	25	17.04	3.29
Referencing skills	3	15	11.28	2.98

Source: Primary data, 2020.

Table 22. Test preparation study skills subscales.

Subscales	Min.	Max	Mean	SD
Technical abilities	13	30	22.84	3.50
Psychological abilities	3	15	10.26	2.54

Source: Primary data, 2020.

Table 23. Test taking study skills subscales.

Subscales	Min.	Max	Mean	SD
Technical skills	10	35	26.46	3.95
Attitudes before submission	9	25	18.67	3.13

Source: Primary data, 2020.

5. Discussion

This study aimed at determining dimensions and dynamics within the study skills questionnaire administered to UR undergraduate students at NPC. Findings reveal that the study skills questionnaire is multidimensional with time management, notes taking and writing study skills registering three factors while reading, test preparation and test taking study skills record two dimensions. These findings were supported by Britton and Tesser (1991); Macan et al. (1990); Rao and Azmi (2018) as well as Razali et al. (2018) for time management study skills and Biçak (2013), Doreen (2008) and Zhang et al. (2011) for test preparation and taking study skills. Besides, descriptive statistics demonstrated that, for time management, students fare better in time punctuality and time allocation but have deficiencies in time-planning. For notes taking, students are ready for taking notes, but present problems in notes wording and polishing. For reading study skills, students are good in form-related strategies, but issues are rampant in content-reading strategies. For writing study skills, students fare better in writing proficiency and info-gathering skills, but have difficulties in referencing skills. For test preparation skills, students are good in technical abilities with challenges in psychological abilities. Finally, for test taking study skills, students do better in their technical skills than their attitudes before submitting scripts.

These findings demonstrate that students are strong in some specific aspects of study skills but also experience important difficulties in other particular aspects of the same study skills. This implies that while improving the quality of

learning in higher education, attention should not be only put on study skills categories in general but should go further to focus on specific aspects of each type of study skills.

In the view of the above findings, it is evident that NPC students need to be empowered in some important aspects of study skills. These include effective time planning with a particular emphasis on making a daily plan of academic and personal activities, respecting planned schedule, and setting daily goals. This is very important for students' success at university and in every day life because, as we know, failing to plan is planning to fail. Moreover, students need to be helped in notes wording and notes polishing especially in putting notes in their own words, using abbreviations and symbols as well as in identifying important points while taking notes; in checking notes taken against other students' notes, in reviewing and editing their notes and in organizing their notes. Indeed, all these skills facilitate the process of notes taking and make easy notes revision. Equally, there is a need to encourage students to regularly review their reading materials, to summarize them in their own words, to develop the reading culture so as to help them be self-confident. It is also necessary to motivate them to always formulate important questions and try to answer them while reading notes. Moreover, NPC students need to be helped to reference their academic works both within and at the end of the text and make sure that the in-text referencing is fully provided at the end of the work and vice versa. This is because quality academic works must be well referenced for academic integrity respect. Likewise, inspiring students to be mentally and emotionally well prepared to sit for tests can be impressively appreciated because this greatly impacts on their academic achievement. Finally, NPC students need to be supported but also be reminded to provide grammatically correct answers, to always review answers and check mistakes so as to increase the quality of their answers; to avoid malpractices, which undermine personal and institutional integrity and reputation, and do tests taking into consideration the time allowed so as to end on time.

The findings of this study contribute to literature on study skills questionnaire analysis in higher education and on students' levels in different aspects of study skills. Particularly, the study enriches the literature as far as the questionnaire analysis of time management, test preparation and test taking study skills is concerned. Besides, to the the researchers' knowledge, it is the 1st comprehensive questionnaire analysis for notes taking, reading, writing study skills questionnaire. In other words, this study brings new knowledge to the literature about the multidimensionality of reading, test preparation and test taking study skills. The study shed light on students' strengths and difficulties in different aspects of study skills, which have to be taken into consideration by all concerned stakeholders in charge of improving the quality of learning and teaching in Rwandan higher education and beyond.

The findings could be used by UR to elaborate the study skills handbook as a guide to students by taking into consideration the identified difficulties and

strengths in different aspects of study skills. University counselors could base on the findings to provide appropriate guidance and counselling services on the use of proper study skills. Teachers and parents or guardians could use the findings to design appropriate intervention to support students improve various aspects of study skills. Students could utilize the findings to take adequate strategies for optimizing their academic outcomes through improvement in their way of studying. Correspondingly, other researchers could use the reliable and valid study skills research tool and related findings in similar studies.

6. Conclusion

This study achieved its aims of determining possible dimensions within the study skills questionnaire administered to UR undergraduate students at NPC and unpacking dynamics within study skills identified factors for the six investigated study skills. It provides a reliable and valid study skill research tool that can be used by other researchers in similar studies. It demonstrates that students are not good in some important aspects of study skills. Thus, UR, teachers, students, parents or guardians and other education stakeholders are called up to refer to the findings in taking adequate strategies to address the identified gaps for academic outcomes improvement. In line with this, the study recommends UR to elaborate the study skills handbook to be used as a common guide for students. It also recommends the provision of guidance and counselling services to undergraduate students on the formation of good study skills at the start and during their studies.

As the study did not explore possible reasons behind the identified students' strengths and weaknesses in some aspects of study skills; further researches can focus on this unexplored area. Investigation into the relationship between dimensions of study skills subscales and demographic factors can also be another area of interest for researchers. Besides, the generalization of the findings to other UR colleges and universities should be done with caution because the study is limited to police officer students living in particular conditions and having a particular status among university of Rwanda undergraduate students. A bigger sample from university of Rwanda or other universities through the country is vital for generalization purposes.

Informed Consent

All study participants were given the opportunity to give their informed consent.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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Chapter V: Factors shaping students' study skills

This chapter matches with the fourth manuscript which is not issued yet. It examines factors shaping students' study skills.

Factors shaping academic study skills of University of Rwanda undergraduate students at National Police College

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Abstract

This study examines factors shaping University of Rwanda (UR) undergraduate students' study skills at the National Police College (NPC). It follows a qualitative cross-sectional design and used focus group interviews to collect data among 60 students of Professional Police Studies (PPS), Law and Computer Science with the option of Information Security (CSIS) programs. Homogeneous sampling was applied to choose group members. Data were thematically analyzed. Results indicate that institutional, teacher and student related factors interplay to shape students' study skills. Institutional factors include, among others, NPC good living environment, its rules and regulations, as well as UR teaching and exam timetables. Students' related factors involve individual personalities like carelessness or lack of seriousness; lack of interest and confidence, fear of difficult lessons, failure and exam; students' demographics such as age, marital status and year of study; use of media, and English language barrier. Teachers' behaviors include stopping students from taking notes in class, providing soft notes before the lesson, and not assessing additional reading material. Thus, students should be supported to improve their study skills by taking into consideration the identified hindering factors. A mass study skills improvement campaign should be conducted by UR in all its colleges to raise awareness of study skills relevance and development at higher education level.

Key words: Study Skills, factors, University of Rwanda, undergraduates, National Police College, Rwanda.

1. Introduction

Skills in learning and studying are essential to ensure success in higher education and in the workplace (Drew & Bingham, 2012). Effective study skills are linked to excellent results in a variety of academic content areas and students who have effective study skills get better grades and perform better in class (Tennen & Hagar, 2015). Nevertheless, students who lack good study skills suffer greatly at various stages of their studies (Naqvi, et al., 2018).

Numerous studies determined the quality of undergraduate students' study skills (Didarloo & Khalkhali, 2014; Ezeala & Siyanga, 2015; Kumar, 2015; Mukingambeho, et al., 2019; Naqvi, et al., 2018; Shackebaei, et al., 2015; Shahidi, et al., 2014). The majority of these studies found that students have moderate to poor study skills (Ezeala & Siyanga, 2015; Didarloo & Khalkhali, 2014; Kumar, 2015; Mashayekhi, et al., 2014; Mukingambeho, et al., 2019; Shahidi, et al., 2014; Sekar & Rajendran, 2015; Shackebaei, et al., 2015; Somuah, et al., 2014). However, these studies did not go far to explore factors shaping students' study skills. Besides, there is a lack of such research in Rwanda. Therefore, the present study speaks to those factors in the context of Rwanda.

The present study was conducted on UR undergraduate students studying at NPC in Musanze district, Northern Province. Three programs of study namely PPS, Law, and CSIS were the concern of the study. This college was chosen as a case to study because previous studies (Mukingambeho, et al., 2019; Mukingambeho, et al., 2022) found that its undergraduates have moderate levels of study skills in time management, note taking, reading, writing, test preparation, and test taking skills (Mukingambeho, et al., 2019) and present difficulties in time-planning, notes wording and polishing, content-reading strategies, referencing skills, psychological abilities in preparing tests and attitudes before submitting examination papers (Mukingambeho, et al., 2022). So, the researchers felt the need to further their study by examining the reasons behind their unsatisfactory levels of study skills and associated difficulties. In other words, the present study is a further step towards clarifying factors shaping the study skills of those students.

The study aims at answering the following question: What are the factors shaping study skills of UR undergraduate students at NPC? The study limits to the six study skills including time

management, reading, note-taking, writing, test preparation and test taking skills as previously investigated by Mukingambeho, et al., (2019) and Mukingambeho, et al., (2022).

The study would provide useful information to UR in general, Rwanda National Police (RNP) through NPC, lecturers and students in particular about variables determining quality learning in undergraduate studies and what can be done to deal with hindering factors. Thus, they can work towards addressing the identified challenges for better attainment of their education visions, missions and goals.

This study is divided into four sections. Firstly, an overview of the research is offered. Secondly, factors shaping students' study skills are reviewed. Thirdly, the methodology used to conduct the research is described. The fourth part contains a presentation and discussion of major findings with a conclusion.

2. Literature review

2.1 Factors shaping students' study skills

Factors shaping time management skills

In higher education, effective time management is a requirement for independent study (Shahabudin, et al., 2010). However, students do not always make the best use of their time (Aduke, 2015). Inability to properly manage their time is due to lack of a clear purpose in their study, distractions and interruptions (Miqdadi, et al., 2014; Shahabudin, et. al., 2010), transition from directed to self-directed study time, modularization of courses, poor note-taking, reading, research and writing skills (Shahabudin, et. al., 2010). Other studies (Adeel, 2018; Alani, et al., 2020; Iftikhar & Ajmal, 2015; Mansoor & Ali, 2015; Mohamed, et al., 2018; Zakaria, 2016; Zotorvie, 2017) indicated that living in hostels with quiet and calm environment and facilities allow students get enough time for their studies. However, as there is no monitoring in hostels, students waste half of their time on social media and chat in unwanted activities (Chang, et al., 2013; El Khatib & Khan, 2017; Mohamed, et al., 2018). Moreover, studies revealed that students' study time is disturbed by family affairs or responsibilities especially for married students

(Nasrullah & Khan, 2019; Zartler, 2010). Students who have not developed time management skills may be challenged by the flexibility and freedom of a university environment (Razali, et al., 2017). Likewise, academic stress, interpersonal relationships (Lin, Pan, & Ching, 2015), provision of lecture notes and handouts given before the class sessions influence students' ability organize their time (Erdemir & Tomar, 2019).

Factors shaping note taking skills

Note-taking is one of the most vital students' skills (Sharifi, et al., 2013). Unfortunately, student notes are often inaccurate or incomplete (Boye, 2012) due to lack of self-awareness as they believe that they take appropriate notes (Bonner & Holliday, 2006), insufficient time to take down notes; feeling lazy writing notes, slow pace in writing notes; lack of proper notebooks to take down notes, unimpressive spelling of words during lecturing or dictation by teachers; and hesitations in teachers' speaking (Baffoe, et al., 2015). Siegel (2022) identified that personal, speaker, and contextual factors impact students' notetaking. Speaker and personal factors were found to influence students' notetaking ability more than contextual factors. The speaker characteristic rate of speech was reported as the most impactful factor. Two personal factors were namely an individual's interest in the lecture topic and their own notetaking skill. Interest in the topic was the factor that generated the most agreement among respondents in all five countries, indicating that this personal factor plays a role in notetaking regardless of national context of students. The contextual factors include topic difficulty, volume, and time of day. Students pointing to speaker factors (i.e., rate of speech and accent) and personal factors (i.e., interest in the topic and one's own notetaking skills) more often than contextual factors (i.e., volume, time of day, and purpose for notetaking). Personal factors were revealed to affecting notetaking rather than individual speaker or contextual factors.

Factors shaping reading skills

For any student, reading is one of the most crucial academic activities (Scott & Saaiman 2016). It is critical for completing all university courses (Salehi, et al., 2014) and achieving academic achievement at the postsecondary level (Akabuike & Asika, 2012). At this level, students are exposed to a variety of learning materials, many of which require independent reading (Bharuthram, 2012).

They must devote a significant amount of time to reading in order to obtain the necessary information and understanding from the assigned reading material (Scott & Saaiman, 2016). Nevertheless, Tien (2015) posits that students' quest for achievement is impeded by their lack of mastery of reading skills. Equally, Shen (2013) indicated that deficiency in language ability (inadequate language proficiency); large number of reading assignments, inability to deal with large amount of text; lack of background knowledge and technical terms in the subject; learning experiences limited to reading short passages are contributing factors to students' academic poor reading. In addition, word recognition speed, text complexity, environmental factors, anxiety during reading comprehension, interest and motivation affect students' reading abilities (Gilakjani & Sabouri, 2016). Students' attitude, peer influence, literacy level of parents, environment of schools and cost of reading materials affect good reading habits among students (Shanmugathan, 2017), too much academic work, limited internet connection, family and job responsibilities, inability to afford buying books and accessing reading resources, irregular electricity, too many physical, mental and emotional disturbances, and few or no reading resources to their favorable topics inhibit students' reading habits (Wema, 2018). Little reading habit or lack of a reading culture (Benedicto, 2013; Pitan, 2015; Talukder, 2011); limited or non-encouragement for extensive reading (Bharuthram, 2017; Talukder, 2011); lack of enough time (Benedicto, 2013; Pitan, 2015) were also mentioned as hindrances to students' reading abilities.

Factors shaping writing skills

Effective academic writing is essential for each university student, because a number of university assessments focus on how students present information in writing (Gonye, et al., 2012). However, students face a variety of academic writing challenges (Gonye, et al., 2012; Komba, et al., 2012;

University of Technology Sydney- UTS Business school, 2014). Writing proficiency is hindered by the language use where students are incapable of using language appropriately and effectively in their writing performance (Chokwe, 2013; Chokwe, 2011; Gonye, et al., 2012; Javid & Umer, 2014; Nik, et al., 2010). Likewise, this language deficiency is commonly observed in Rwandan higher learning institutions (Higher Education Council- HEC, 2015; Sibomana, 2014; Nizeyimana, 2013).

Other studies mentioned too large classes, which make lecturers unable to provide effective feedback to students' written assignments, and lack of lecturers' attention to students' academic writing (Pineteh, 2014), lack of academic writing units to help practicing writing skills in and after class (Chokwe, 2011; Pineteh, 2014) as other writing academic challenges. In addition, the quality of student writing is being impacted by increased access to social media writing genres such as Facebook, Twitter, Short Messaging Services (SMS), and Blogging. When writing academic papers, students frequently struggle to shift from the informal social media writing style to the more formal academic language (Pineteh, 2014; Williams, 2008). Inadequate reading skills are also mentioned as causes academic writing challenges because the only way to gain a solid understanding of how to utilize punctuation, correct spelling, make complicated sentences, and comprehend the meanings of terms that may be employed in one's own work is through reading extensively at university (Yagoda, 2006). Furthermore, contradictory feedback from teachers of different departments within an institution (Can, 2009), a lack of feedback offered to students, particularly after lecturers have returned student essays for marking, contribute to students' lack of confidence (Archer, 2007). If students' faults and strengths in their writing are not shared, the same errors may be repeated in subsequent activities (Archer, 2007).

Factors shaping test preparation and test taking skills

The reviewed literature commonly combined test preparation and test taking skills into one study. But the present study does not abide by such approach. Tests are commonly used to evaluate students' academic performance worldwide (Dodeen, 2009; Mutimani, 2016). However, for majority of students, the time of examination is a highly stressful period. While low level of stress can help in motivating the students, more stress can be discouraging making students exhausted, overwhelmed and confused (Vaz, et al., 2018). The study done by Simran, et al. (2015) revealed

that too much course load, lack of time to do a revision before the exam, lack of systematic studies, expectations from parents and lack of time for other activities like exercise and extracurricular activities contributed to exam anxiety. Another study conducted by Li N, Li B, Dou and Wang (2015) identified that examination reform, others' opinion, worry of future, physical and psychological discomfort, lack of confidence and previous academic record lead to anxiety. Similarly, Sharma and Kaur (2011) showed that motivation, commitment and interpersonal variables can influence stress. In the same way, difficult level of test, environment of examination hall, invigilation; personal and emotional factors play an important role in exam performance (Neemati, et al., 2014). Lack of preparation, fear of failing, family responsibilities, characteristics of the professor and exam, lack of time management skills, and lack of study skills increase test anxiety for Bachelor level students (Dukaru , 2017).

Overall, from the above reviewed literature, it is evident that there are several factors shaping university students' study skills. However, it is noticeable that they were not categorise for easy identification. Thus, the present study aims at confirming or rejecting the presence of similar factors in the context of Rwanda, which experiences a shortage of such research. It also clarifies the categorization of these factors in line with the investigated study skills.

2.2 Theoretical review

The present study is based on Albert Bandura's Social Cognitive Theory (1989). The theory posits that learning is affected by cognitive, behavioral, and environmental factors (Bandura, 1991). In other words, learning occurs in a social context with a dynamic and reciprocal interaction of the learner, the environment in which the learning takes place, and his/her behavior (Bandura, 1986). Besides, Bandura (2001) established that human agency, self-regulation and self-efficacy are critical for learning. Human agency relates to the fact that learners make an intentional decision to invest in learning and change behaviors (Bandura, 2001). Self-regulation refers to self-generated thoughts, feelings, and actions that are planned and cyclically adapted to the attainment of personal goals (Boekaerts, 2005). Self-efficacy concerns an individual's beliefs in their capabilities to successfully control actions or events in their lives. It is based on the individual feeling that he/she possesses the requisite cognitive abilities, motivation, and resources to complete the task (Wood

& Bandura, 1989). Self-efficacy affects students' motivation and learning (Pajares, 1996, 2006; Schunk, 1995, 2003) and relates to one's efforts, persistence and choice of activity (Bandura, 1997; Pajares, 1996). Self-efficacy influences how much energy students will spend to complete various academic tasks (Schunk & Pajares, 2009). Students who feel self-efficacious are likely to set academic goals for themselves and use effective strategies to achieve these goals. They adapt and regulate their behavior as needed and accept responsibility for their own learning (Schunk & DiBenedetto, 2014). Students who are self-efficacious are more likely to engage in self-regulatory behaviors, whereas those who are not are less likely to feel motivated (Schunk & DiBenedetto, 2014).

This theory which clarified learning factors fits well with the present study that aims at examining factors shaping students' study skills. Students' behaviors and cognition and, the study environment can influence their study skills. Thus, this study confirms or rejects the presence of similar personal, cognitive and social factors in relation to investigated study skills of time management, note taking, reading, writing, test preparation, and test taking study skills in the context of undergraduate students of UR at NPC.

3. Methods

3.1 Research design

The present study follows a qualitative cross-sectional design (Creswell, 2012). It seeks to examine factors shaping UR undergraduate students' study skills at NPC in time management, note taking, reading, writing, test preparation and test taking skills.

3.2 Participants

Sixty (60) undergraduate students of PPS, Law and CSIS participated in the study. They are students of the academic year 2016-2017 from year one to year four. Students were purposively chosen as respondents because their level of academic study skills was found moderate (Mukingambeho, et al., 2019) and have difficulties in various aspects of study skills

(Mukingambeho, et al., 2022). Thus, this study is a continuation of these previous studies. Therefore, researchers selected students as key informants to provide valuable and needed information about themselves on factors shaping their study skills. The National Police College was chosen as a case to study because the concerned students are police officers of that college and study in the premises of NPC.

3.3 Measures

Qualitative data were collected using interview guide in groups of 5 students per class making a total of 60 students for 12 classes. Homogeneous sampling was used because all students were thought to be knowledgeable about the research topic. Those five students included, for each class, 1 class representative, 2 best performing and 2 poor performing students referring to the last academic results of 2016. Both sex were represented for each class. Interview guide was set referring to the research question and was piloted to 5 undergraduate students of Forensic Science program. These were NPC students but not yet UR students because the program started later than the previous ones and processes to be included in UR programs were still ongoing. The interview guide was refined based on answers from the piloting phase. The choice of 5 group members was motivated by the fact that through discussion, multiple viewpoints about factors shaping students' study skills are captured. In addition, the group of 5 members was mentioned by previous studies as the ideal group (Bouchard, et al., 1974; Bouchard & Hare, 1970; Cortini, et al., 2019; Nyumba, et al., 2018; Osborn, 1953; S later, 1958). Furthermore, the researchers found the group of 5 members manageable in data collection as confirmed by Cortini, et al., 2019). Data were audio-recorded, transcribed and analyzed thematically. Findings were presented in a narrative way.

3.4 Procedures

Permission was sought and obtained from the Inspector General of RNP through the Commandant of NPC. Besides, the research permit was granted by UR- College of Education directorate of research. Likewise, informed consent was obtained from the students involved in the study after being informed about the purpose, requirements, risks and benefits of participating in the research. Face to face data collection took place at NPC in students' respective classrooms in 2018 and each interview lasted about 2 hours.

4. Findings

The present study intended to examine factors shaping the study skills of undergraduate students of UR at NPC. Findings reveal three categories of factors namely those related to the learning institutions, teachers and students themselves.

4.1 Institutional factors

Institutional factors shaping students' time management skills

Students reported that NPC good living conditions, its rules and regulations help them to manage well their time but also prevent them from managing well their time. On the one hand, they clarified that their institution does not involve them in some activities that can take on their time comparing to other students of UR colleges who are sometimes found in food shopping and cooking. They clarified that their movements outside the college are limited as per the college rules and regulations. Consequently, they spend most of their time in studying as it is their primary duty. The contribution of NPC in students' time management was highlighted in the following students' statements:

“Time management is most developed than other skills. This depends on police institution where we are, which focuses on time management. We study using time. Enough time is spent on studies. College environment make us to attend regularly academic activities. It is a must to attend classes here at NPC.

“The first thing that helps students to manage well their time is the life that we live in here at NPC. There are some duties or activities that our institution does not engage us in. We do not do some activities that other students in other universities do like shopping, cooking with stress. Here, we only focus on studying, whether hungry or not, when classes end, I get the food ready”.

“Limited outside movement is one of the factor that make student to concentrate on their studies. There is movement order, we do not go outside NPC as we want, we go there rarely and this make us to plan focusing on our studies. The study environment is structured in that way. Nothing can prevent someone to manage time well in this institution”.

However, on the other hand, students mentioned that they have little control on planning their academic and personal activities because of their institution. They declared that their plans are mostly disrupted by the plans of their institution that they are called to obey. They indicated that they follow the plans of the institution not theirs. This is evidenced by the following arguments.

“We plan but our plan fails sometimes because as we are planning our leaders are also planning. Then, we end up following the plans of our leaders. Our plans are disturbed by some activities for example when we want to revise, you find that our leaders have planned another activity for us to do, then we end up failing to fulfil what we planned. For instance, the institution values the presence of a lecturer only. In his/her absence, instead of using that time to revise the lessons and do some assignments, we are engaged in other activities of the institution”.

“The reason why we don’t make our plan it is because they make it for us. So we don’t have nothing to add on. This results from being, at the same time, students of UR and staff of RNP. Indeed, in the weekends, some of us are tasked to attend the institutional duties. Thus, this results in time inadequate to revise and do assignment in weekends. So nothing we can change for the NPC administration plan. We have to follow the institutional planned activities”. We always set our goals but our college is the one to plan for us”.

“National Police College is not like other UR Colleges. All students at NPC have to obey the activities put in place by the college irrespective of students’ activities. In this case, basing on the activities which are set by the college, we might find that even when we plan to work on learning activities provided by different lecturers, mostly during our free time, we do not sometimes profit that free time just because they collide with college activities and we find that NPC planned activities are given the first priority hence hindering our daily activities”. We try to plan depending on the fixed timetable of the institutions but also on the other hand, it keeps on changing i.e. bringing unexpected activities”.

Finally, students indicated that UR academic timetable is an opportunity for some students but also a hindrance to their time management for others. Some students expressed the following:

“We do not have the same timetable. Many times, PPS timetable goes up to 12 pm while that of Law and ICT with Information Security stops at 16 pm. In such cases, PPS students may benefit from afternoon time to rest, revise their lessons or do lecturers’ assignments if they are not given other duties by the institution”.

“Sometimes the class timetable is an issue. We study one module each week or one module for two weeks. When we study morning and afternoon, we do not get the time to rest. This affects our time for reviewing the two studied modules when you have studied the whole day. In this case, we find time insufficient”.

Institutional factors shaping notes taking skills

Students indicated the duplicated curricula of UR to be the source of poor notes taking skills. They pointed out that the curriculum of English offers a duplicate content learnt in other modules and this discourages them to take similar notes as explained below.

“The problem is poor curriculum of English we learn. It focuses on some content covered in other modules like how to reference, how to study which is learnt in Life Skills Education for Policing module. So we are not interested to take notes of such similar content”.

Institutional factors shaping reading skills

Students revealed that the nature of their program, practical lessons; good internet connection at NPC influence their reading skills especially students from ICT and information security as clarified below.

“Our reading is mainly internet- based in ICT. If something is difficult, we consult the internet and write it down to help in revision. We rarely go in the library for reading purposes. There is no problem of internet connection at NPC”.

“The nature of our lessons which are predominately practicals play a big role. We go to the internet to follow someone who did a given practice on YouTube. In addition, because of focusing on codes in ICT, when something went wrong, we go on YouTube to see how the code runs; we imitate it and reach the goal instead of going into the books to read about it”.

Institutional factors shaping writing skills

Students highlighted that the study of some modules’ components in year one and three help committed students to improve their writing skills. Equally, students from ICT program underlined that the nature of their program of study which consists of many practicals impact on their writing skills. One student affirmed the following:

“In year one, we study about academic study skills in Life Skills Education for Policing module; in year three we learn Library Skills in Communication skills and research skills in Research Methods modules. So, these help students who are committed to improve their study skills”.

“In our faculty, we mainly use codes, instead of typing codes on the paper, we type them in the machines, run them to see the output. For instance, if we are asked to make a webpage or website, you do it directly in the machine to see the output not on the paper”.

Institutional factors shaping test preparation skills

Students reported that exam revision periods help them in preparation of final exams but they pointed out exam timetable provided by UR to affect their test preparation skills as explained below.

“We have periods of exam revision of one week, this helps in preparing final exams but for CAT it is a personal arrangement because no time is given for preparing them. However, sometimes, we fail to individually manage our time because of bad timetable of exams. For instance, at a time, in year two, we had 3 exams in 3 successive days; so, we were not ready for the exam of the 3rd day; it was not well revised”.

Institutional factors shaping test taking skills

UR exam timetable was mentioned by students to be unfriendly where exams are put on unfavorable hours, uncomfortable start time and abrupt change of exams as explained below.

“UR is to respect time of the exam and avoid disturbances in exam. Let me give an example, in last times, ICT students were used to come in examination room at 9am late while PPS and Law students had started theirs at 8am in the same room. In such cases, we were not really comfortable, we were disturbed a lot because we did not start at the same hour with other students of the same examination room. But things have changed, we enter into examination room at the same hour”.

“Examination timetable of UR is sometimes not good like putting exams on unfavorable hours like from 11am to 1 pm or 3pm to 17pm for ICT students. This disturbs us. Changing the exam timetable before the day of starting exams is not also good. It is used to happen”.

“In ICT and Law, we study the same modules with other students of UR at CST Nyarugenge and CASS Huye. So, some exams are similar, and we are sometimes disadvantaged. We may sit for our own exam in the morning and afternoon again we sit for another exam common to other CST or CASS students and in such a case, we do two exams per day. In such case, the exam preparation/revision becomes very difficult. In addition, this makes us to do so many exams in few days and then, we have nothing to do in the remaining days of the exam timetable”.

4.2 Teacher- related factors shaping students’ study skills

Teacher- related factors shaping notes taking skills

Students reported that teachers’ behaviors influence their notes taking skills. They include for instance stopping them from taking notes in class, explaining or projecting the PowerPoint too fast, providing soft notes before the lesson, not assessing the additional reading materials, or requiring students to reproduce the notes in formative and summative assessments. The following are some of the answers provided by the interviewed students.

“When the teacher is teaching, many students take notes. But, sometimes, the teacher stops them from taking notes to follow explanations and tells them that he/she will give the notes after class. When the teacher does not stop them, they are encouraged to take notes. In addition, taking notes in class depends on the speed of the lecturer. Some lecturers are too fast while lecturing. When using slides, they go fast and we do not have time to take notes and we prefer to follow explanations and wait to read notes after class”. Besides, we take notes according to the lecturer’s speed in providing explanations. There are some lecturers who are too speedy to take notes”.

“Sometimes, our lecturers need us to cram, then we find ourselves taking notes the way they are without putting them into our own words. Again, teachers frequently give us soft notes and we rarely write notes in the books except few explanations. Furthermore, taking notes in related reading materials depends on the teachers’ routine of assessing them. Teachers’ assessments focus on what they have given us. They are not used to ask questions on other provided reading materials. Therefore, we are not motivated to read and take notes from them”.

On the question asking them whether they put concepts in their own words while taking notes, students said that they rarely do it because of the nature of assessments given by lecturers. They

clarified that lecturers require them to produce the same notes, therefore, they find no need of rephrasing the notes taken.

Teacher- related factors shaping reading skills

Students mentioned that while reading lecturers' notes, they many times find that the teacher has already underlined or italicized some key words. Consequently, they find themselves no need to do it again as the lecturer has done it for them.

“When reading the notes given by the lecturer, we rarely underline or italicize them because frequently we find that the lecturer has already done it”.

Teacher- related factors shaping test taking skills

Students studying ICT reported that they sometimes do not end exams or CATs on time since lecturers do not give them enough time for completing those assessments. But students from PPS revealed that the study of Life Skills Education for Policing having the component of academic study skills including tests taking skills support those who are interested to do well in CATs or exam.

“In ICT, lecturers are used to ask open questions in CATs or final exams like making a website and this is time consuming, resulting from not completing all questions asked.

“In PPS, we had had the chance of studying the module of Life Skills Education for Policing having the component of study skills. It helps those who are interested to improve their test taking skills every year”.

4.3 Student- related factors shaping students' study skills

Student- related factors shaping time management skills

Students reported that good or bad time management depends on individual personalities or individual character behavior like carelessness or lack of seriousness, use of media, and family responsibilities for married students, fear of difficult lessons, age, marital status, and year of the study as exemplified below:

“Planning academic and personal activities depend on individual personality. Every student has his/her way of planning the day but we can find some students who fail to plan well their activities because of careless or lack of seriousness in what they do. Depending on individual personalities, some students could not be satisfied with the way they manage their academic and personal activities mainly because free movement out of the institution is not allowed; it is not automatic as we have to ask for a permission, So a student who likes to be out of the institution in free time, may find this not good”.

“Responding to many calls especially for married students could be a barrier for managing their time than single students. They have other responsibilities at home, we find them having some family problems, and are sometimes disturbed by family calls and problems and this make them not manage well their time. Besides, social media take students time. They are used to be on WhatsApp, watching movies or games like football on their laptops or smart phones and going out of class to respond calls make students mismanage their class time”.

“Fear of difficult lessons make us to manage well our time for ICT students. We dedicate enough time to succeed them. Almost all lessons were difficult especially in year 1, they had codes, which require regular practices to master the codes”.

Students mentioned also that their age, marital status and year of study influence the use of their time. They confirmed that in general adults manage well their time than young ones because they many times know what to do and married manage well their time than single students because of their commitment to studies which are motivated by their family responsibilities. For year of study, students said that they get enough time as they advance in level of study as a result of familiarity with academic life but also because of reduction in number of modules to study as clarified by the following student:

“In year 1 and 2, you don’t get enough time because of lots of modules to study and unfamiliarity with university working life. There are 12 modules of 10 credits each one while from year 3 onwards, the time is gotten since the number of modules to study is reduced from 6 to 4 each term with some having even 20 credits”.

Student- related factors shaping notes taking skills

Students testified that the language barrier prevent them from taking effective notes. They explained that they are not able to summarize notes, to use abbreviations while taking notes because of the language barrier. They reported that many of them do not master English as the language of instruction and this hinders them from taking notes from the lecture because of poor vocabulary or poor understanding about what the lecturer said as clarified below.

“Many of us do not really master English as the language of instruction. We take notes from lecturers’ speaking, can’t summarize notes, and use abbreviations with poor English understanding and vocabulary”.

Students also confirmed that some of them do not check the notes taken in class against those of their classmates with their understanding that the notes taken are enough, their bad handwriting or their personal abbreviations which are not common or familiar to most of them. Moreover, students mentioned that some students have little skills on notes taking resulting from their educational background in high schools where they were used to copy teachers’ notes from the blackboard. Fortunately, on the other hand, students indicated that the availability of notes taking and notes keeping materials impact positively on their notes taking skills. They clarified that they have those materials as they have financial means to buy them.

Student- related factors shaping reading skills

Lack of interest, insufficient knowledge about the role of reading, laziness, wanting easy life affect students’ reading skills. Besides, students reported that they normally review notes when preparing CATs and final exams. They indicated that they read notes after checking their size and decide when to start the reading activity. They mentioned that they do not read all the notes and this sometimes affects their test taking skills as expressed below by one of the students.

“We experienced one case where the lecturers gave us notes which were somehow similar to the notes of last year and we studied the last notes while there were updates in the new notes and during exams, we realized that the lecturers asked things that we do not have because of confusing notes”.

Student- related factors shaping writing skills

Students mentioned the language barrier due to French background, poor research skills, the year of study, the study of library skills and study skills, non- mastery of referencing styles, insufficient time, the nature of assignments, ignorance, outdated books in the library as the main factors shaping their writing skills. The following arguments clarify their positions.

“Studying everything in English at University is not easy for students having a French background, mainly adults’ students who completed secondary school many years ago. Our level of English is low, we have gaps mainly in speaking; our English grammar is questionable, we are not strong in writing because of our background in French. We do not provide grammatically correct answers as a result of language barrier. The written work is not good. You could find someone making a long sentence of free lines. The low level of English language make sometimes difficult to understand assignments. Students can go about the assignment without understanding the question. The structure of the work is respected (introduction, body and conclusion), but the problem could be the content. Students respect the structure of the work as when marking, lecturers take it into account”.

“Writing in English improved with year. English language difficulties were experienced by students who joined UR while being police officers because of their French background, but with time, there was improvement. In Year one, they made so many mistakes, and improvement was done progressively”.

Students mentioned that poor research skills about the topic to work on depends on the year of study. They clarified that they experience difficulties in year 1 and 2; but from in year 3 because of the study of library skills, it becomes easy to search information in library or online. Besides, the lesson on study skills in year one facilitates research of electronic sources. However, they reported that ICT students rarely use the library because of lack of relevant ICT books and existence of outdated ones.

In relation to referencing, students mentioned that often in text citation is not often provided due to failure to directly write the source, copying ideas without copying the sources and forgetting

where the source was taken. They indicated that sources at the end of the work are many times not well referenced because of non-mastery of how to do it. They also established that when they still have time to cross check the work done before its submission, they look at both references. However, they indicated that referencing was improved especially in year 3 because of the lesson of Research Methods and lecturers took into account references while marking essay questions at that level.

On the question asking them whether they directly start doing assignment as soon as it is given, students replied that it depends of the nature of assignments. They explained that when it is an individual assignment, every student is encouraged to do it on time as they fear to fail individual work, but for group works, the courage is held by some students as it is rare to miss some courageous students who work on behalf of others who are not committed to work in group on time.

When asked whether they review assignments before final submission depends on the time you still have before its submission. They responded that if they still have time, they do it and if not they leave it. They added they rarely give their assignment to another student for reviewing it before submission because everyone is busy in class with completing assignment and it depends on the type of assignment. When it is the same assignment for the whole class, it is not done by fear of copying others' assignment. For different works, it was due to lack of that skill, not knowing that this must be done.

Student- related factors shaping test preparation skills

Students reported that fear of failure, having notes because of financial means, lack of individual time management, and individual test preparation strategy make them to engage or not in early revision of their lessons. In fact, students expressed that they take enough time to revise their lessons because when reading, the purpose is test preparation. They added that failure to engage in early revision may be lack of individual time management. They equally mentioned that early test preparation is due to fear of failure but also result from the fact that they have notes thanks to their financial means contrary to other students of UR as one student clarified it below.

“Here students have notes, and this is different from other students at UR where you could find a student without notes. We have financial capacity as we get salaries, so it is easier to photocopy notes. This helps in early preparation of final exams but for CAT is a personal arrangement”.

Moreover, past examination papers, year of study, fear of exam, past test experience and lack of confidence were mentioned to effect students test preparation skills. On these factors, they clarified that when preparing tests, they are used to search and read past examination papers and a student could go to his/her classmates to ask how to answer such questions. This helps them to know how a given lecturer sets questions and they prepare themselves consequently. They also explained that students’ inability to differentiate what they have learnt and not learnt, while preparing the test; could result from failure to understanding the content or fear of the exam. However, they testified that such difficulty is mainly experienced in year 1 because of unfamiliarity with university exams.

Furthermore, students said that many of them pass the night studying the day before exam because of panic, study habits or test preparation strategy as illustrated by one of them.

“In fact, many students panic. Some students say that they remember well in the exam when they study before the exam; it depends on the strategy adopted by each one. Some students came earlier at 3 am to fix the remaining content for those who like to study in a quiet environment”.

Lastly, students reported that they are not confident about the way they have prepared the test because of fear of exam or failure of past exam when they had spent a lot of time preparing it.

Student- related factors shaping test taking skills

Students mentioned different individual factors that impact their test taking skills including fear of exam, stress, panic, lack of confidence, failure to understand the question, and doing the exam quickly. They clarified that many of them do not survey the exam questions; they directly start answering the questions due to lack of confidence, because they think themselves that they have to write answers down while still remembering them but also this results from fear of the exam.

Besides, students reported that they rarely read exam instructions because of being unstable in the exam but also instructions do not usually change for some lecturers. They explained that they usually read them carefully after the exam where they often realize mistakes done resulting from not prudently reading instructions earlier at the start of the exam. In such case, instructions are not respected and this affects the way the exam is taken as expressed by one student from ICT program.

“We do not read instructions, we did it in year one but in year three, we do not read them, it is a routine, and nothing is changed in them, instructions remain the same, they do not change like write in the margin, registration number, etc. However, one time in year 1 we did not read instructions and we were used to be given two hours of the exam, because of not reading instructions, after we were told that we still have 15 minutes and we were surprised”.

Students reported that they start answering from simple to difficult questions. They explained that their exams are usually made up of two sections and mainly section B is simple than section A. They clarified that starting from simple questions help to not use a lot of energy in thinking about their answers and help to get enough time to concentrate on difficult questions. They added that starting with difficult questions is starting to stress yourself; it makes them panic.

On the question regarding reading test questions, students replied that they took time to read and try to understand them because of language barrier. However, one student reported that she does not read the whole questions as a result of past experience.

“One day, I read the whole questions and I found them difficult and started to panic and had fear and forgot answers of other questions. Since that time, I do not read them, I start from the 1st one and answer each one. When the question is difficult I jump it and come back on it later after finishing questions that I know”.

Moreover, respondents informed that sometimes they don't read exam questions carefully and the result is failure as expressed in the following experience.

“At times, teacher gave a question in CAT and in the final exam, he reproduced the same question but with small changes. Many of us answered the same question of CAT while there was a change in the final exam. After the exam, we were surprised to see that some of us wrongly answered the question. Obviously, we failed that question”.

Students also said that it is not easy to remain calm and remember well answers in the exam due to fear of the exam, lack of confidence, and hurriedness to write what comes 1st in the mind. They also reported that there are low cheating cases in their college because of fear of their institutional rules of being imprisoned and expelled from the college and police force. However, they said that it happened to look at on others' papers as mentioned by this student from ICT:

“Looking at on others' papers happened. When for instance, you forgot a code, you have the tendency to look at on your classmate's copy to see whether you can see the code”.

Students said that taking into account marks given to each question depends on individual reasons like having enough marks in CAT or students' impulsiveness, imprudence, rashness. They said that they pay attention to marks given to questions of section B since they often weigh heavily comparing to section A.

It was reported that reviewing answers before exam submission is done by few students due to perhaps individual reasons like thinking that what they have answered before are true. But also students review answers when they still have time. They acknowledged that they make mistakes in their answers due to language barrier but also hurrying to meet the time given because in assignment they make few errors.

Students stated that the time given to the exam is enough. They revealed that those who do not end the exam on time may result from the student's failure to answer the questions and remain in the examination room thinking about any idea to write on the answer sheet. They indicated that generally PPS and Law students end the tests on time except ICT because of Mathematics and formula in their exams.

Finally, students declared also that they are not confident about the way they did exam as expressed below.

“Students leave the examination room with more fear than before the exam, because of not being sure about the correctness of the answers provided. This results from lack of confidence, because we could even find

later that those students passed well the exam. The lack of confidence may be due to language barrier by asking him/herself if he/she really understood the question and answered it correctly”.

5. Discussion

This study aims at examining factors shaping UR undergraduates’ time management, notes taking, reading, writing, test preparation and test taking skills at NPC. Three categories of institutional, teacher and student - related factors were found to shape students’ study skills.

Firstly, different institutional factors were reported to influence all investigated study skills. In relation to time management, it was found that students manage well their time as a result of staying in NPC hostels, its facilities and its internal rules and regulations. This concurs well with other studies such as Adeel (2018), Mohamed, Hamal and Mohamed (2018) and Zakaria (2016) that students living in hostels get enough time and spend more time on their studies. Prominently, outside movement limitations were found to be a contributing factor to students’ good time management. This was established as a particularity to this law enforcement college as opposed to other UR colleges attended by civilians where students are free to move out of the college, which plays a very little role in supporting students to manage well their time. This is understandable because law enforcement agencies are normally governed by strict disciplined rules which are not common in normal public and private institutions but which are useful in helping students to be good time managers.

However, the study revealed that students have little control on planning their academic and personal activities because their institution plans for them. In the same way, UR academic timetable was found to be an opportunity but also a hindrance to students’ time management. These findings show that students fail to self- plan their time as a result of their institutional status of a police force. Though time management is nothing but self-management (Cyril, 2015), it is clear that students do not design an efficient study plan which may lead to ineffective studies (Chanamarn & Tamee, 2017). Normally, students’ time use is based on how effectively they plan and manage themselves, their daily activities, and schedule of their study time to achieve their academic standards (Nasrullah & Khan, 2015). Furthermore, although Razali, et al., (2017)

reported that the flexibility of a university environment and freedom can ruin students who have not learned the skills of time management; it is evident, from this study that, inflexibility of a university environment in terms of its unexpected plans, strict rules and regulations as well as UR unfriendly timetable impede students' self- planning of their academic and personal activities. These contradicting findings show that the impact of a higher learning institution on students' time management is context specific.

With regards to notes taking, the duplicated curricula of UR especially for English module was mentioned to discourage students from taking similar notes. This finding does not correlate with any reviewed studies, which mainly focused on student- and teacher- related factors (Baffoe, et al., 2015; Bonner & Holliday, 2006) with no attention to institutional factors. This means that factors are context specific and are therefore relevant area for further studies. For reading skills, the nature of lessons coupled with strong institutional internet connection play a big role in students' reading skills. Besides, it was noticed that the type of the reading material depends on the nature of the activity given and its requirements for doing it. This implies that students do not read all reading materials given like notes and related books as a result of their practical lessons and institutional facilities exemplified by strong internet connection support students' engagement in reading activities. This agrees with and complements what Zotorvie (2017) found that university facilities in hostels allow students to get more time and manage well their studies.

Concerning writing skills, it was demonstrated that the study of some modules' components including Library Skills, Study Skills and Research Methods help students to improve writing skills. This implies that students are able to transfer knowledge from one situation to another. Besides, the nature of practical lessons of ICT was shown to have impact on students' writing skills because they write in machines to see the output not on paper. For test preparation skills, it was found that UR exam revision periods of one week significantly facilitates final exams' preparation but its unfriendly exam timetable, sometimes, makes them to not get enough time for revision. In relation to test taking, final exam timetable put, at times, on unfavorable hours, uncomfortable start time and abrupt change of exams dates are hindering factors to students test taking skills. Some of the findings concur well with Simran, et al. (2015) that lack of exam revision time contributes to exam anxiety, which is a sign of poor preparation and test taking skills. The

study of module of Life Skills Education for Policing having the component of study skills was found to help them improve their test preparation and test taking skills. This infers that the study of some modules, frequently mentioned, support in development and enhancement students' study skills. This displays that students are able to transfer the acquired knowledge from one learning situation to another to better their studies with personal efforts, self-reflective practices as theorized by Bandura (1989) in his Social Cognitive Theory.

Secondary, varied students related factors were revealed to shape their study skills. In relation to time management, individual personality or individual character behavior was found to affect their study skills like carelessness or lack of seriousness, unfamiliarity with university working life, personal satisfaction with college rules and regulations; use of media; family responsibilities and commitment for married students, fear of difficult lessons, students' age, marital status, year of study, lack of enough time due to lots of modules to study in the 1st years of study. These findings corroborate with a number of other studies. According to Aduke (2015), Miqdadi, et al. (2014) and Shahabudin, et al. (2010), students often don't use their time cautiously and are not able to manage their time because of distractions and interruptions. For Mohamed, et al. (2018), Chang, et al. (2013); El Khatib and Khan (2017); Nasrullah and Khan (2019), students staying in hostels waste their time on social media and chat as there is no monitoring in hostels. Another study by Zartler (2010) confirmed that management of family affairs/responsibilities disturbs students' study time. This entails that students need to learn how to manage their time as an important component of self-regulated learning (Thibodeaux, et al., 2017) at university.

In relation to notes taking, students' non mastery of English as the language of instruction, difficulties of understanding the handwriting and abbreviations of classmates, little knowledge in notes taking skills resulting from high school backgrounds, beliefs that they take good notes were mentioned to prevent them from taking effective notes. In particular, students from CSIS mentioned that their program of study consists of many practicals on computers that impact on their notes taking skills. However, on the other hand, the availability of notes taking and notes keeping materials influence positively their notes taking skills. These findings agree with Bonner and Holliday (2006) that students can demonstrate a lack of self-awareness, believing that they take suitable notes; but disagree with Baffoe, et al. (2015) about the lack of proper notebooks

which hinders students from taking down notes. These contradicting findings show that factors shaping notes taking skills are context specific, therefore a relevant area for research. It is noticeable that a number contributing and hindering factors interplay to shape students' note taking skills. Unfortunately hindering factors outnumber contributing ones, a serious issue because as Sharifi, et al. (2013) explained, note-taking is one of the most important skills of students since students begin to learn during note-taking (Boye, 2012).

For reading skills, lack of interest, insufficient knowledge about the role of reading, laziness, wanting easy life, availability of reading materials in the library, not reading all the notes affects negatively their test taking skills. These findings show that students do not spend enough time in reading learnt materials even though the study done by Scott and Saaiman (2016) shows that higher education requires students to spend large amounts of time in reading to gain the required information and knowledge from the reading material. This means that their academic performance can be negatively affected, because reading has a key role in completing all university courses (Salehi, et al., 2014) and for achieving academic success at tertiary-level education (Akabuike, 2012). The studies of Gilakjani and Sabouri (2016); Gilakjani and Sabouri, (2016); and Yang (2016) agree with the present study which shows that students are not interested and motivated to engage in early reading of their notes. But the current study contradicts Wema (2018) that students' inability to afford buying books and accessing reading resources; few or no reading resources inhibit their reading habits. Instead, this study found that there are so many good reading books in the library that a student can take time and read especially for PPS and Law students, they have notes because of their financial means.

With respect to writing skills, students mentioned the language barrier, poor research skills, non-mastery of referencing styles, lack of enough time to review the course works, the nature of assignment i.e. individual vs group assignment, ignorance, the year of study, the study of Library Skills and Study Skills as the main factors shaping their writing skills. These findings are supported by a number of studies including Komba, et al. (2012); and Gonye, et al. (2012) who found that students have various academic writing challenges. In particular, the common finding of English language deficiency in several studies in Rwandan higher learning institutions (HEC, 2015; Sibomana, 2014; Nizeyimana, 2013) is also confirmed by this study.

Furthermore, availability of notes, past examination papers, year of study, past test experience, fear of failure, insufficient time, lack of individual time management, individual test preparation strategy were found to influence students' test preparation skills. Finally, fear of exam, stress, panic, lack of confidence, failure to understand the question, doing the exam quickly were indicated as factors influencing their test taking skills. These findings are supported by Vaz, et al. (2018) who confirmed that the time of examination is a stressful period. In the same vein, Simran, et al. (2015); Dukaru (2017) revealed that lack of time to do a revision before the exam contributes to exam anxiety. Another study conducted by Li N, et al. (2015) and Dukaru (2017) identified that worry of future, fear of failing and previous academic record lead to anxiety as it is the case in this study. Dukaru (2017) also supports this study that lack of time management skills affects test anxiety for Bachelor level students. However, Dukaru (2017) established that confidence decrease anxiety level, an aspect which contradicts this study.

In short, these findings demonstrate a number of individual factors shaping test preparation and test taking skills. Psychological factors were found to include fear of failure, fear of exam, fear of stress, panic, and lack of confidence. This implies that students must be helped to be mentally well prepared for regular tests as part of academic life. College guidance and counseling services can play a great role in dealing with the issue.

The third category of factors that were reported by students to shape their study skills are related to their teachers. It was proved that teachers' behaviors influence students' notes taking, reading, and writing skills. These findings agree with Baffoe, et al. (2015), Shanmugathan (2017) and Pineteh (2012) that teachers play a role in influencing students' notes taking, reading and writing skills of students even though the factors identified by the authors differ from those of the current study. This suggests that factors shaping note taking, reading and writing skills of students are context specific, which gives these categories of study skills their relevancy to be studied. Finally, students mentioned that teachers do not give them enough time to do Continuous Assessment Tests especially in CSIS. This corresponds with Neemati, et al. (2014) though the context differs from this present study. This illustrates different contexts and variety of factors shaping students' study skills.

From all these findings, it is evident that there is a variety of intertwined and contextual institutional, teacher and student- related factors shaping students' study skills. This wide range of factors are cross- cutting in different study skills where for instance English language barrier was established to affect notes taking, reading, writing, test preparation and test taking skills. Psychological factors were also stressed to impact test preparation and test taking skills. It is noticeable that the study of some modules influence all study skills investigated. This is supported by Yagoda (2006) who established a relationship between some academic study skills including writing and reading abilities. This implies that study skills must be enhanced conjointly not separately. In addition, institutional and students factors were found to be dominating factors in 6/6 and 5/6 in respective study skills investigated. Teachers were not found to affect time management and test preparation skills of students. This suggests that while improving students' study skills, attention must be paid to all categories of factors with special emphasis on institutional and student- related factors.

This study confirmed the Social Cognitive Theory of Bandura since it found that there are social (institutional and teachers' factors) and cognitive factors (fear, stress, panic, lack of confidence) that shape students' study skills. All investigated study skills were found to be unanimously influenced by personal efforts (students' factors) and social interactions (institution and teacher related factors) to a very high level. So, the identified hindering factors should form the basis for remedial strategies by all concerned stakeholders with the final goal of improving students' learning outcomes and producing quality graduates as one of the aims of higher education in Rwanda and beyond.

In line with the findings, a close collaboration between UR and NPC should be established to address any challenge that could go against quality learning. Collaboration between students, NPC and lecturers in case of coincidence of activities should be encouraged and considered by concerned parties. UR, NPC and lecturers should constantly remind students about their responsibilities in learning and their leading role in improving their study skills. Lecturers should prioritize teaching and learning activities that help students to continuously develop good study skills and avoid any actions that prevent students from developing good study skills and encourage

students to always take their studies seriously. Students should know that they have a leading role in improving their study skills by spending much time on practicing study skills.

6. Conclusion

This study examined factors shaping UR undergraduate study skills at NPC and found that institutional, teachers' and students' factors interplay to shape students' study skills. However, the study was conducted on a small number of UR students with a particular status, thus the findings may not be generalized unless in populations with the same characteristics. So, other studies on undergraduate or postgraduate students' study skills in other Colleges of UR, as well as Rwandan private higher learning institutions, could be conducted to present a more realistic picture of factors shaping students' study skills. Despite these concerns, the findings contribute significantly to the existing literature on undergraduates' study skills. It demonstrated factors shaping study skills are multiple, linked and intertwined in various ways, they are crosscutting in different study skills and are context specific. The study proved that a number of personal, cognitive and social factors impact students' study skills. Thus, the identified factors should be taken into consideration when supporting students to improve their study skills. The concerned stakeholders, particularly UR, NPC, teachers and students themselves should be actively involved in addressing the identified challenges. Mechanisms for addressing hindering factors could be collaboratively developed and implemented by all concerned stakeholders. This will help students to change their mindset, study well, succeed academically and lead a fruitful life in a developed Rwanda, in which they are contributors. In line with the findings, a mass study skills improvement campaign should be conducted by UR in all its colleges to raise awareness of study skills relevance and development at higher education level. Guidance and counseling services should be established and reinforced at NPC to assist students improve their way of studying. Further research should focus on similar studies in other colleges of UR and private higher learning institutions in Rwanda and beyond.

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Chapter VI: General conclusion

This study explored students' practices of academic study skills at UR/NPC achieves its five objectives. In relation to the first objective that aims at finding out the extent to which students self-report their conversancy with the investigated study skills; the findings indicated that students have moderate levels of study skills; they were found to be somehow good in time management but with difficulties test preparation skills. With the second research objective of identifying variations among students' study skills based on their demographic features; the study revealed that the investigated study skills vary according to students' demographics except for gender, which was found to affect primarily test preparation and test-taking skills. For the third research objective of determining the dimensions within the study skills questionnaire; the findings clarified that the study skills questionnaire is multidimensional with time management, notes taking and writing study skills registering three factors while reading, test preparation and test taking study skills record two dimensions. Concerning the fourth objective of demonstrating how students rate themselves in different subscales of study skills; the findings revealed that students are someway good in time punctuality and allocation but have problems in time-planning. They are ready for taking notes, but have problems in notes wording and polishing. They are good in form- related reading strategies, but issues are rampant in content- reading strategies. They try in their writing proficiency and info-gathering skills, but have difficulties in referencing skills and they are good in technical abilities with challenges in their psychological abilities and the study found that they do better in their technical skills than their attitudes before submitting scripts. For the fifth and last research objective of examining factors shaping students' study skills, findings show that institutional, teachers' and students' factors shape students' study skills. The study confirmed the social cognitive theory because it proved that a number of personal, cognitive and social factors impact students study skills and their approaches to learning.

However, this study has got some drawbacks. To begin with, the research area was limited to only a tiny portion of UR undergraduates who are also police officers. These respondents have a different social and living situations than their civilian counterparts. With this in mind, the findings can only be applied to groups with similar characteristics outside of the research sample. Other studies on undergraduate or postgraduate students' study skills at other Colleges of UR, as well as

Rwandan private higher learning institutions, could be conducted to present a more realistic picture of how students study in Rwanda. Second, quantitative data were collected using a self-reported questionnaire (paper 1, 2 and 3). Thus, social desirability considerations may have influenced responses. Students might have exaggerated or underestimated their study behaviors. Despite these concerns, the findings contribute significantly to the existing literature on undergraduates' study skills. The research provides current, accurate, and comprehensive picture of study skills in Rwanda. The discovered flaws can be used to build remedial interventions in Rwanda and other countries with similar characteristics.

The findings indicate that students experience challenges not in all aspects of study skills but in some of them. So, generalization of students' weaknesses or strengths in study skills must be considered with great care. The study demonstrates that even though the factors shaping study skills are in three categories, they are multiple, linked and intertwined in various ways, crosscutting in different study skills and are context specific. Institutional and student related factors were found to be dominating in all study skills investigated. It was noticed that findings confirmed some studies and contradicted others. This stipulates that variables of students' study skills might be context- dependent.

In relation to approaches to learning, the findings inform that students study and learn in different ways. Some students do not take a comprehensive approach to learning and their efforts are disorganized. In other words, some students struggle with study skills in their studies. This could explain the numerous criticism that some Rwandan university graduates lack the necessary employability skills. The research also demonstrates that university learning is an art, and that students should be supported at all levels. Further, students' demographic characteristics and factors influencing their study skills should be considered when providing support.

This study contributes to the literature on study skills questionnaire analysis in higher education and on students' levels in different aspects of study skills. Particularly, the study enriches the literature as far as the questionnaire analysis of time management, test preparation and test taking study skills is concerned. Besides, to the researcher' knowledge, it is the first comprehensive questionnaire analysis for notes taking, reading, and writing study skills questionnaire. Simply put, this study brings new knowledge to the literature about the multidimensionality of notes taking, reading and writing study skills. Moreover, the study provides a reliable and valid study skills

research tool that can be used by other researchers in similar studies. The study shed light on students' strengths and difficulties in diverse aspects of study skills, which have to be taken into consideration by all concerned stakeholders in charge of improving the quality of learning and teaching in Rwandan higher education and beyond. Thus, higher education institutions, students, teachers, and other education stakeholders can use the findings in taking action for better academic outputs, outcomes and impacts.

In line with these findings, the study recommends the elaboration of the study skills handbook to be used as a common guide for students in higher education in Rwanda. The provision of guidance and counselling services at NPC on the development and use of good study skills and concerned institutions and teachers should address hindering factors to effective study skills. A mass study skills improvement campaign should be conducted by UR in all its colleges to raise awareness of study skills relevance and development at higher education level. As the study did not exhaust all aspects of students' study skills, further studies can focus on these unexplored areas: 1) Exploring students' study skills in other UR colleges; 2) Investigating the relationship between dimensions of study skills subscales and demographic features; 3) Exploring other students' study skills including listening skills, concentration, library skills, etc.; and 4) Establishing the relationship between students study skills and academic performance.

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I, Delphine Mukingambeho student registered (reg. number: 215037887) for PhD by research in Curriculum and Instruction, in the year 2022, hereby declare the following:

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- I confirm that the submitted work for assessment has acknowledged parts of other authors in academic way.
- I have followed the required conventions in referencing the thoughts and ideas of others.
- I understand that the University of Rwanda may take disciplinary action against my work if there is a proof that this is not my own work, or I have failed to acknowledge the source of the ideas in my writing.

Signature:



Date: May 15, 2022

Appendices

Appendix 1: Reliability of study skills scales

Table 2: Reliability of study skills scales

Scale	Cronbach Alpha
Time management skills	.77
Notes taking skills	.78
Reading skills	.78
Writing skills	.86
Test preparation skills	.72
Test taking skills	.76
Total study skills scales: 6	. 857

Source: Primary data, 2018

Appendix 2: Interview guide for focus group Interviews

1. How do you rate or assess the level of study skills of PPS, Computer Science (ICT) and Law students in time management, notes taking, reading, writing, test preparation and test taking skills?
2. Can you help us to rank all these component of study skills starting on the component where PPS, Computer Science (ICT) and Law students are good in? Could you provide details about your ranking?
3. In your opinion, what are PPS, ICT or Law students' strengths and/or weaknesses with regard to the following study skills: time management, notes taking, reading, writing, test preparation and test taking? What are the possible factors associated with those strengths and weaknesses?
4. Do you think PPS, Computer Science (ICT) and Law students' time management, notes taking, reading, writing, test preparation and test taking skills are influenced or vary with gender, age, marital status, working experience, year of study, program of study, status before joining the UR (civilian vs. police officer)?
5. What hindrances or obstacles can prevent a PPS, Computer Science (ICT) and Law student develop good study skills time management, notes taking, reading, writing, test preparation and test taking?
6. In your opinion, what strategies should be devised to help PPS, Computer Science (ICT) and Law students to improve or develop effective study skills in time management, notes taking, reading, writing, test preparation and test taking? Who should implement those strategies?

END

Appendix 3: Statistical tables of paper 2

Table 3: Study skills and gender

Gender of the respondent	N	Mean	SD
Female	48	251.1250	32.51816
Male	350	259.0000	30.65615

Source: Primary data, 2018

Table 4: Study skills and age

Age of the respondent	N	Mean	SD
18-24	182	250.4973	32.05933
25-34	172	264.4012	28.17918
35-45	43	264.7907	30.13111
Total	398	264.7907	30.13111

Source: Primary data, 2018

Table 5: Multiple comparisons: Study skills and age

		Mean Difference			95% Confidence Interval	
(I) Age group	(J) Age group	(I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
18-24	25-34	-13.90390*	3.21044	.000	-21.4567	-6.3511
	35-45	-14.29343*	5.12313	.015	-26.3460	-2.2409
25-34	18-24	13.90390*	3.21044	.000	6.3511	21.4567
	35-45	-.38953	5.15420	.997	-12.5152	11.7361
35-45	18-24	14.29343*	5.12313	.015	2.2409	26.3460
	25-34	.38953	5.15420	.997	-11.7361	12.5152

*. The mean difference is significant at the 0.05 level.

Source: Primary data, 2018

Table 6: Study skills and marital status

Marital status of the respondent	N	Mean	SD
Single	312	255.8526	31.62609
Married	86	266.0233	27.06592

Source: Primary data, 2018

Table 7: Study skills and working experience

Working experience of the respondent	N	Mean	SD
Zero	199	252.0603	31.87454
1day -5 years	118	263.6610	29.34796
6-10	49	258.9388	28.49664
11-15	18	273.7222	25.49465
Over 15	10	276.3000	27.80508
Missing	4	263.5000	29.54657
Total	398	258.0503	30.95080

Source: Primary data, 2018

Table 8: Multiple comparisons: Study skills and working experience

		Mean			95% Confidence Interval	
(I) Working experience	(J) Working experience	Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
Zero	1day -5years	-11.60072*	3.52857	.014	-21.7061	-1.4953
	6-10	-6.87847	4.84327	.715	-20.7490	6.9920
	11-15	-21.66192*	7.47488	.045	-43.0690	-.2548
	over15	-24.23970	9.84201	.138	-52.4260	3.9466
1day - 5years	Zero	11.60072*	3.52857	.014	1.4953	21.7061
	6-10	4.72224	5.16127	.943	-10.0590	19.5035
	11-15	-10.06121	7.68474	.780	-32.0693	11.9469
	over15	-12.63898	10.00233	.805	-41.2844	16.0064
6-10	Zero	6.87847	4.84327	.715	-6.9920	20.7490
	1day -5years	-4.72224	5.16127	.943	-19.5035	10.0590
	11-15	-14.78345	8.37028	.489	-38.7549	9.1880
	over15	-17.36122	10.53817	.568	-47.5412	12.8188
11-15	Zero	21.66192*	7.47488	.045	.2548	43.0690
	1day -5years	10.06121	7.68474	.780	-11.9469	32.0693
	6-10	14.78345	8.37028	.489	-9.1880	38.7549
	over15	-2.57778	11.97788	1.000	-36.8809	31.7254
Over 15	Zero	24.23970	9.84201	.138	-3.9466	52.4260
	1day -5years	12.63898	10.00233	.805	-16.0064	41.2844
	6-10	17.36122	10.53817	.568	-12.8188	47.5412
	11-15	2.57778	11.97788	1.000	-31.7254	36.8809

*. The mean difference is significant at the 0.05 level.

Source: Primary data, 2018

Table 9: Study skills and year of study

Year of study of the respondent	N	Mean	SD
Year 1	107	243.5234	31.79010
Year 2	98	253.6939	28.50119
Year 3	104	260.1250	28.50743
Year 4	89	277.8876	24.01961
Total	398	258.0503	30.95080

Source: Primary data, 2018

Table 10: Multiple comparisons: Study skills and year of study

		Mean			95% Confidence Interval	
(I) Current year of study	(J) Current year of study	Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
Year 1	Year 2	-10.17051	3.98719	.054	-20.4576	.1166
	Year 3	-16.60164*	3.92670	.000	-26.7326	-6.4706
	Year 4	-34.36428*	4.09107	.000	-44.9193	-23.8092
Year 2	Year 1	10.17051	3.98719	.054	-.1166	20.4576
	Year 3	-6.43112	4.01459	.379	-16.7889	3.9266
	Year 4	-24.19376*	4.17550	.000	-34.9667	-13.4209
Year 3	Year 1	16.60164*	3.92670	.000	6.4706	26.7326
	Year 2	6.43112	4.01459	.379	-3.9266	16.7889
	Year 4	-17.76264*	4.11777	.000	-28.3866	-7.1387
Year 4	Year 1	34.36428*	4.09107	.000	23.8092	44.9193
	Year 2	24.19376*	4.17550	.000	13.4209	34.9667
	Year 3	17.76264*	4.11777	.000	7.1387	28.3866

* The mean difference is significant at the 0.05 level.

Source: Primary data, 2018

Table 11: Study skills and program of study

Program of study of the respondent	N	Mean	SD
PPS	125	253.4640	30.56815
Law	138	267.2464	27.58049
ICT	135	252.8963	32.59207
Total	398	258.0503	30.95080

Source: Primary data, 2018

Table 12: Multiple comparisons: Study skills and program of study

					95% Confidence Interval	
(I) Current program of study	(J) Current program of study	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
PPS	Law	-13.78238*	3.74017	.001	-22.5814	-4.9833
	ICT	.56770	3.75987	.988	-8.2777	9.4131
Law	PPS	13.78238*	3.74017	.001	4.9833	22.5814
	ICT	14.35008*	3.66677	.000	5.7237	22.9764
ICT	PPS	-.56770	3.75987	.988	-9.4131	8.2777
	Law	-14.35008*	3.66677	.000	-22.9764	-5.7237

* The mean difference is significant at the 0.05 level.

Source: Primary data, 2018

Appendix 4: Study skills screen plots of paper 3

Figure 1: Time management skills scree plot

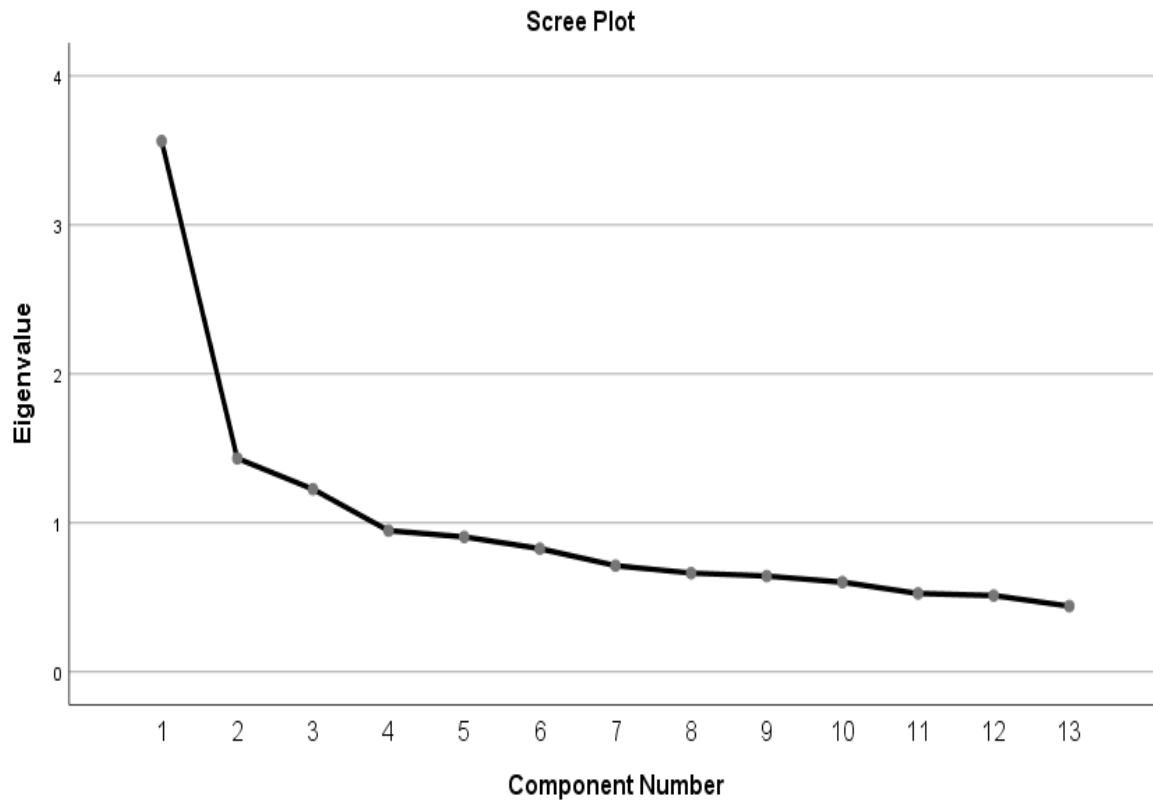


Figure 4: Notes taking skills scree plot

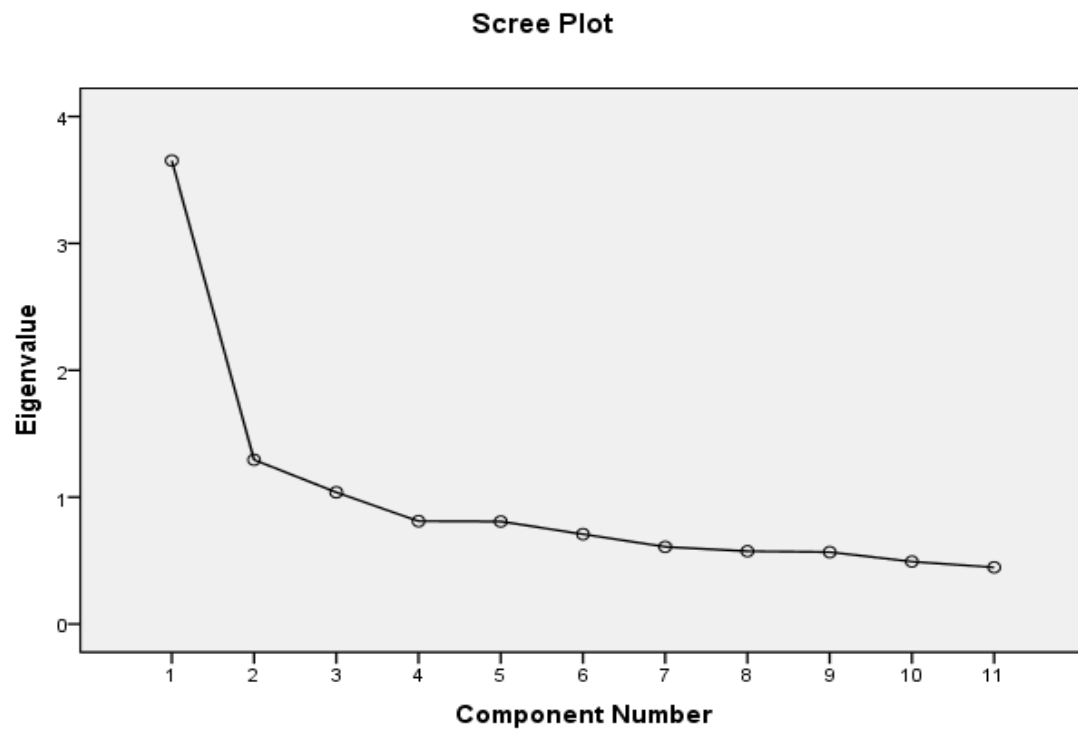


Figure 7: Reading skills scree plot

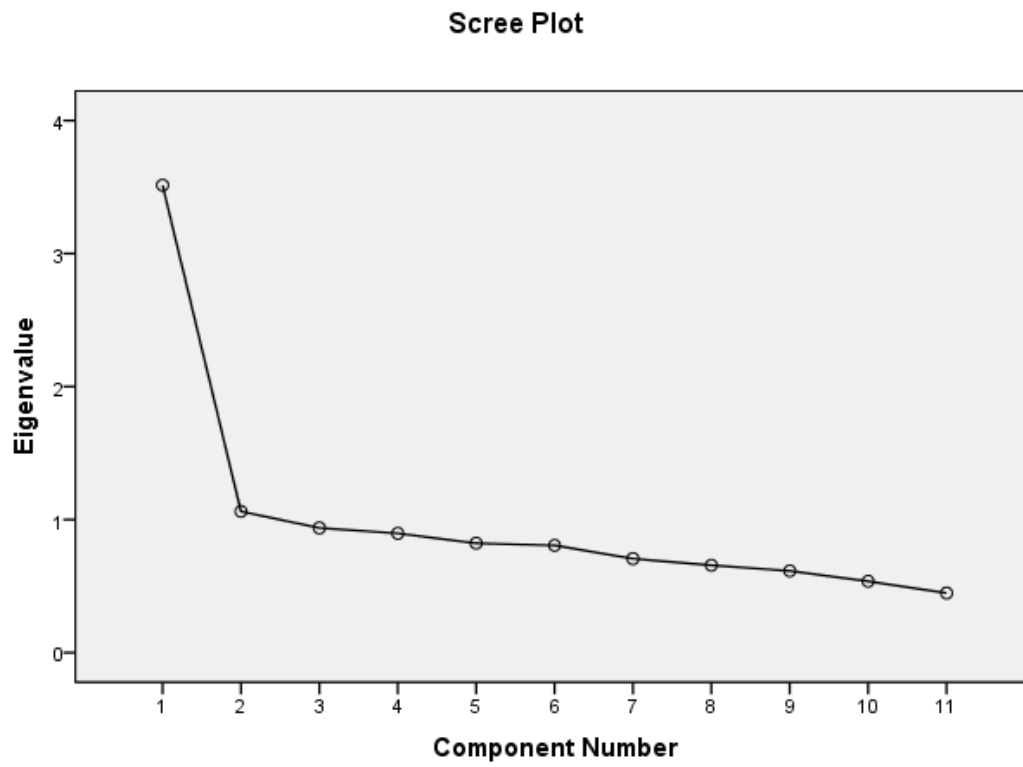


Figure 10: Writing skills scree plot

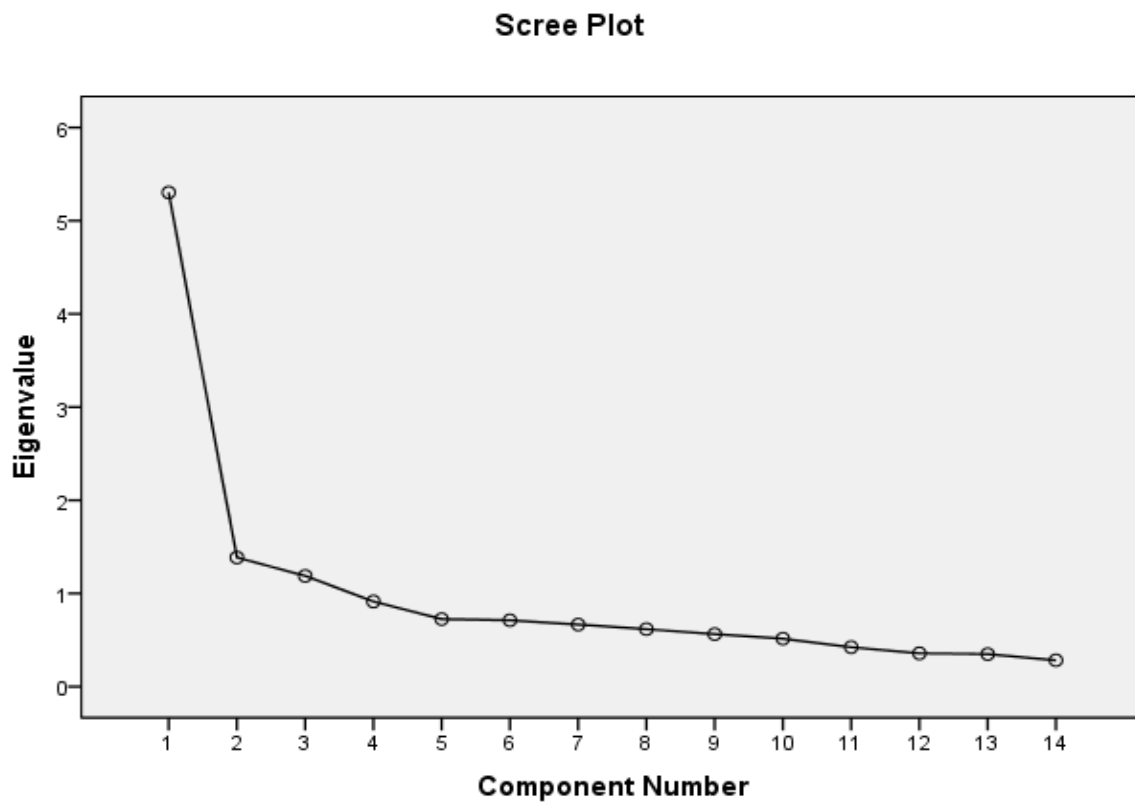


Figure 13: Test preparation skills scree plot

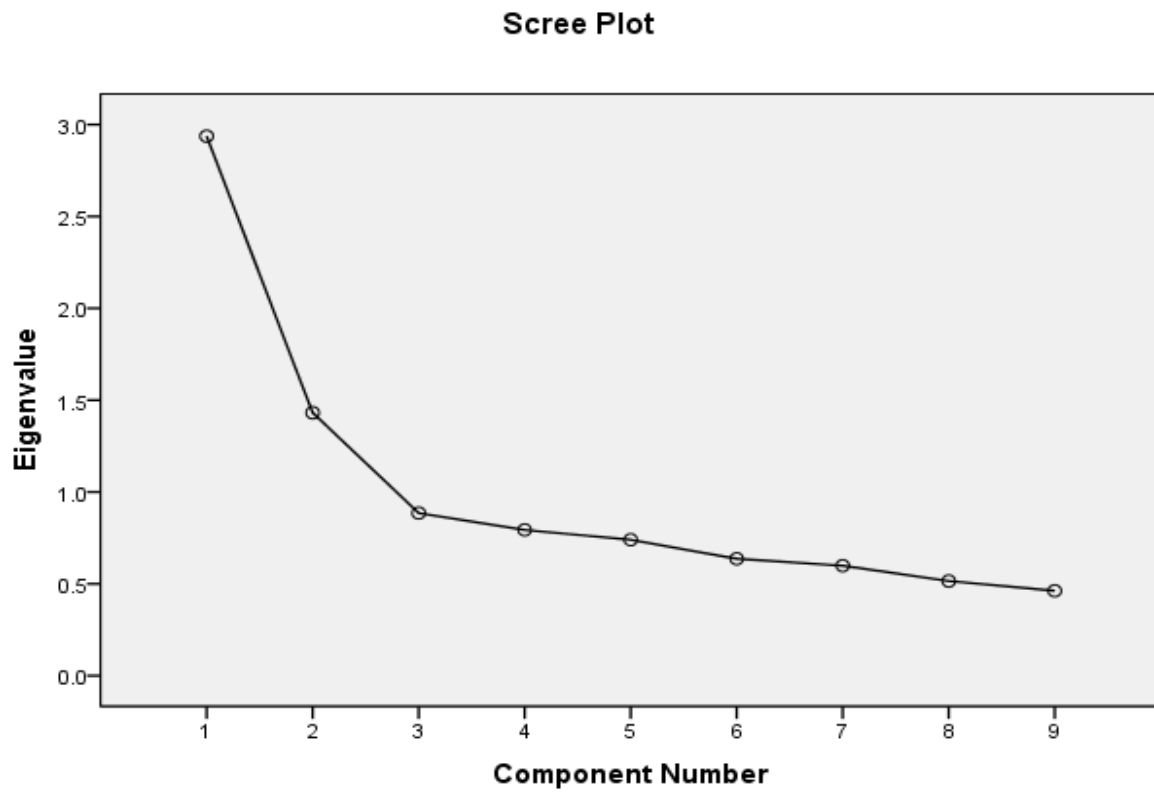
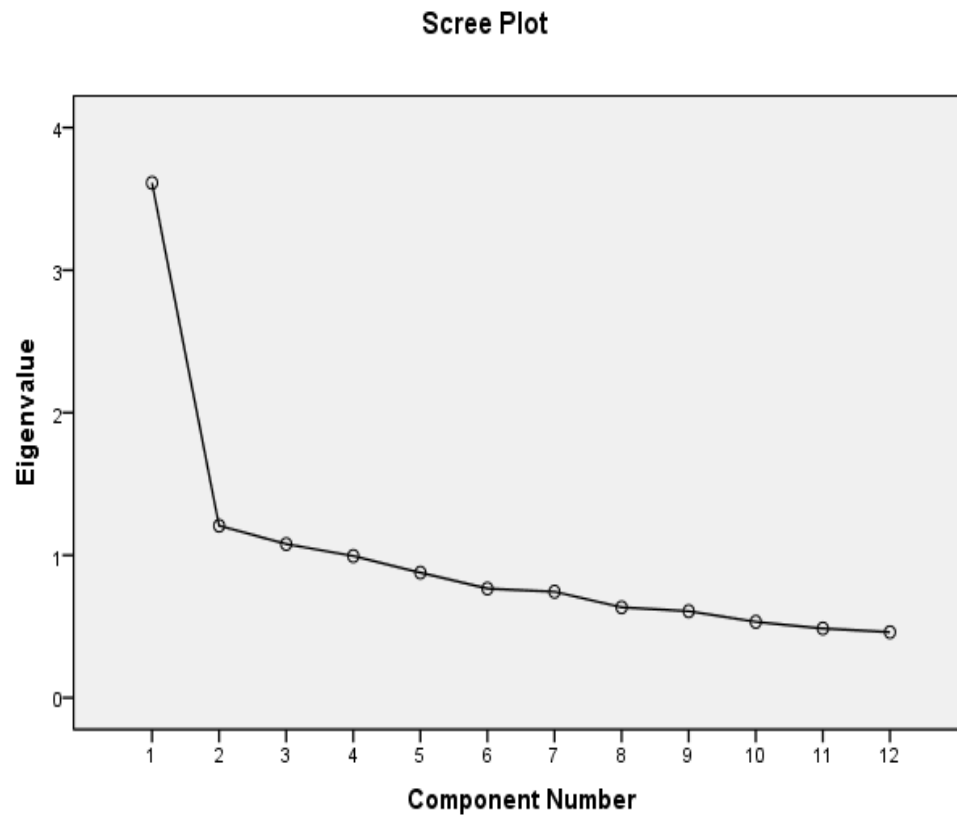


Figure 16: Test taking skills scree plot



Appendix 5: Research permit

Kayonza, 8th November 2018

The Commandant
National Police College (NPC)
Musanze- Northern Province
Rwanda

Dear Sir,

Re: Introduction letter for Mrs. Delphine Mukingambeho to carry out research

On behalf of the University of Rwanda-College of Education (UR-CE), I am pleased to introduce to you Mrs. Delphine Mukingambeho, an Assistant Lecturer and a PhD student in the school of Education of UR-CE Rwanda for your assistance in accessing the required data for his research project entitled: **"Students' practices of academic study skills at National Police College in Rwanda."**

Mrs. Mukingambeho wishes to investigate the students' practices of academic study skills at National Police College in Rwanda throughout three different programs of study offered at your college. For that purpose, she would like to be granted permission to discuss with your students on the above-mentioned research starting from 15th November up to 31st December 2018.

Mrs. Mukingambeho's research project successfully passed through an internal collegial ethical process. Thus, the University of Rwanda-College of Education: Directorate of research and Innovation confirms that her research adheres to ethical standards and principles. Therefore, we kindly request you to accord her your cooperation to enable her research to be successful. In case you need more clarifications, please do not hesitate to contact us on wrceresechin@gmail.com. We very much hope to get your usual cooperation in serving our nation.

With kind regards,

Yours sincerely,



Assoc. Prof. Eugene Ndabaga
Director of Research and Innovation Unit
UR-College of Education

Cc:

- Postgraduate Program Coordinator, School of Education
- Dr. Gabriel Nizeyimana (Supervisor)