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The relationship between taking Maths Literacy at school and a student's ability to do accounting at tertiary level

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I hereby declare that the Research Project submitted for the Post-Graduate Diploma in Higher Education to The Independent Institute of Education is my own work and has not previously been submitted to another Higher Education Institute

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Abstract

Does the Mathematics Literacy content taught at school adequately prepare students to achieve success in accounting at tertiary level? More specifically, did taking Maths Literacy at school make students doubt their ability to successfully complete accounting at tertiary level?

Democracy in South Africa brought about changes to the education system to make it more equitable and accessible to all South Africans. One of these changes was the introduction of Maths Lit in 2006 into high schools as a means to improve students' maths literacy. A review of the literature revealed that not much research has been undertaken to find a correlation between taking Maths Lit and achieving low marks in accounting, there is more literature on the effects of Maths Lit on the science subjects. This research is multifaceted in that it focuses on establishing possible links between low accounting marks at first year tertiary level and having taken Maths Lit as a school subject. It further investigates whether low self-efficacy or confidence levels are caused by taking Maths Lit at school which then impacts negatively on the ability to do accounting at tertiary level. For the ten participants in this study it was derived that having taken Maths Lit at school increased a student's confidence as students stated they no longer '*felt stupid*'. This had a spill-over effect resulting in improved marks for most of the subjects taken at school. This result, however, needs to be further researched to establish if the increased confidence levels equate to higher marks and a deeper understanding of and an ability to do accounting at a tertiary level.

1. Introduction

Does the Mathematics Literacy (henceforth referred to as Maths Lit) content at school adequately prepare students to achieve success in accounting at tertiary level? More specifically, did taking Maths Lit at school make students doubt their ability to successfully complete accounting at tertiary level?

Democracy in South Africa brought about changes to the education system to make it more equitable and accessible to all South Africans (ANC, 1994). One of these changes was the introduction of Maths Lit in 2006 into high schools as a means to improve students' maths literacy (North and Christiansen, 2015). Prior to 1994, any form of mathematics was not compulsory at school level, consequently many school students were entering the workplace possessing limited or no mathematical knowledge or skills (North and Christiansen, 2015). Thus, in an effort to ensure that all students graduated from school with some level of mathematics knowledge, Maths Lit was introduced, and currently school students are able to choose between taking Mathematics or Maths Lit (North and Christiansen, 2015). The introduction of Maths Lit has resulted in endless debates on the merits and demerits of studying Maths Lit (North and Christiansen, 2015).

The Maths Lit curriculums' stated goal is to assist all learners to develop numerical skills, in other words, make sense of the world of numbers. The DoE (2003b:9) emphasized the purpose of Maths Lit as a tool that assists students to confidently interpret, critically analyse and solve every day problems or situations. Human rights, democratic participation and equity fundamental principles underpin the Maths Lit curriculum introduced (DoE, 2003b:9).

A Maths Lit unstated goal has political undertones and in order to comply with democratic interests, Maths Lit has been introduced as a people's subject in relation to the context in which people find themselves, and as Bopape and Volmink (1998) observe, to enable people to consequently see and question the unjust. This action would then be seen to realize the wants and needs of the larger South African population (Bopape and Volmink, 1998).

Accounting grades at first year tertiary level are notoriously low and the challenge for the researcher was to establish if taking Maths Lit had a negative impact on a learner's self-efficacy and their perceived lack of ability due to low confidence levels (Joyce, Hassall, Montana and Anes, 2006).

The change from Maths Core to Maths Lit, negatively impacts the choice of degrees made available to students for further study at tertiary institutions as many degrees require Mathematics Core as an entry requirement. Math Lit students are thus limited in the degrees or career paths they are permitted to choose at tertiary level. Joyce *et al*. (2006) note that Maths Lit students' abilities are perceived to be different by employers, and students themselves feel they are incapable of studying accounting and other subjects (Bansilal, Webb and James, 2015).

1.1 Rationale

The research sets out to determine whether there is a correlation between taking Maths Lit as a school subject and the perceived ability of a student to successfully complete accounting at tertiary level. A need exists to investigate whether Maths Lit is a valuable and useful subject that equips students with the necessary skills to complete most tertiary level degrees, function as a high-level thinker and be respected in the workplace. If South Africa is to produce global citizens, it needs to ensure that students have faith in their abilities and not feel they have been marginalised because of their subject choice (D'Ambrosia, 2003).

The study focuses on first-year university students who attend a private education provider, specifically first-year accounting students studying towards their Bachelor of Commerce degrees. Many of these students matriculated with Maths Lit being one of their subjects and are required to study accounting in their first year of study.

For the qualitative research, students were asked to establish their attitudes towards Maths Lit and if Maths Lit has impeded their ability to study accounting.

1.2 Problem statement

The post-apartheid government has focused on introducing some level of Maths into all schools (Vithal and Bishop, 2006). Since the introduction of Maths Lit, the number of students taking the subject has increased (Bansilal *et al.,* 2015). However, taking Maths Lit limits degree choices at tertiary institutions and furthermore, results for subjects such as first-year accounting are consistently low at tertiary level. Different thinking and learning styles influence a students' choice in taking either Maths Core or Maths Lit at school level (Spanenberg (2012); Baumgartner (2018); Joyce *et al.* (2006); Guner (2007)). A number of

students choosing Maths Lit feel there is a stigma attached to the choice as Maths Lit is regarded as a subject could impact the self-efficacy of the student in his/her ability to do accounting.

Existing literature has focused mainly on a students' ability to complete Science based degrees (Aksu, Guzeller and Eser, 2015). Limited research has been undertaken to explore the impact Maths Lit has on a student's ability to study accounting with only one literature article review by Dull, Schleifer and McMillan (2015), who broach the topic of self-efficacy in accounting students. The article does however, refer more to the anxiety levels that students experience when attempting to do Maths in general and accounting. Thus, this research is deemed to be of value as it will concentrate on the impact Maths Lit has on a students' perceived ability to do accounting. A Maths Lit student's perceived inability to complete accounting may lead to low self-esteem, low self-confidence and affect results for all other subjects.

1.3 Purpose statement

The purpose of this study is to establish if Maths Lit students experience low levels of confidence which lead to difficulty in completing accounting at tertiary level.

1.4 Research Questions

Main Research Question:

Does taking Maths Lit at school impede a student's ability to do accounting at tertiary level?

Sub-Questions:

Is the impediment a lack of confidence or low self-efficacy on the student's part?

1.5 Objectives

The research objectives for this study are:

1) To determine the effect Maths Lit has on a students' confidence (Kremmer, Brimble, Freudenberg and Cameron, 2010; Joyce *et al.* 2006).
2) To assess possible perceptions regarding Math Lit students' abilities and capabilities (Fitzsimons, 2017).

2. Literature Review

Mathematical Literacy was introduced into High Schools as a Grade 10-12 subject (Vithal and Bishop, 2006), and studies have been conducted in an attempt to explain the reasons behind the introduction of Mathematical Literacy. A study by Vithal and Bishop (2006), explains the reasons why Mathematics Literacy was implemented in schools. A definition of Mathematics Literacy in the South African context, and the background against which Mathematics Literacy was introduced is presented, and the aims of Mathematics Literacy are explained in this article. This will prove to be significant in the understanding of the topic under review, Mathematics Literacy.

Venkatakrishan and Graven (2006) further examine the reasons, as do Vithal and Bishop (2006), for the introduction of Mathematics Literacy in South Africa. A contrast, however, is made between the Mathematics Literacy courses introduced in South Africa and in England. The effect that this has had on the levels of maths skills attained and the implications these qualifications has had on the ability to enter a Higher Education facility in both countries, is examined. The article provides a background on the historical reasons for the adoption of Maths Lit and then the effects of this adoption is investigated. This article is valuable to the proposed research because the perceived assumption that Maths Lit students are limited in their Higher Education prospects, is going to be investigated in the study.

Fitzsimons (2017) highlights the differences between mathematics and numeracy. The author mentions that prospective employers are constantly complaining that the levels of mathematical understanding by graduates they employ, are low. Fitzsimons (2017) points out that employers are not looking for actual mathematical acumen, but are looking for graduates who are able to communicate and understand mathematical problems that arise in the context of the workplace. The author, thus, discusses the merits of teaching numeracy which constructs maths knowledge in social, cultural, historical and political contexts. Although the article focusses on adult numeracy and applies to the UK, it is still worth noting as it can be applied to the study as an argument in favour of Maths Lit. Similar maths qualities are taught in Maths Lit in South Africa.

Mathematics and Maths Lit have been introduced into the South African school system as separate disciplines. Mhakure and Mokoena (2011) use both qualitative and quantitative research methods to

highlight both the differences and the similarities of the Maths Lit and Mathematics curricula. The aim is to further identify curriculum aspects that are part of Maths Lit but not part of Mathematics and vice versa. The study supports the view that Mathematics and Maths Lit should not be separated but combined. In addition, as this notion is not currently being practiced, the study suggests intervention mechanisms be employed, that will assist students bridge the gap between the two disciplines. One of the outcomes of the study that is valuable to the proposed study is, the students' attitude towards the learning of Mathematics. Interestingly the study also refers to the effect that lack of parental support has on the students' attitudes towards studying Mathematics.

Mhakure and Mokoenas' (2011) suggestion that Mathematics and Maths Lit should be introduced as separate disciplines is reiterated in this article by Ippolito, Dobbs and Charner-Laird (2017), in which the importance of introducing literacy as part of the Mathematics discipline is highlighted. One of the aims of the study was to challenge the preconceived notion that Mathematics and Mathematical Literacy should be separate disciplines. This article explores the meaning and significance of literacy in a Mathematics class. A distinction is made between Maths Lit and literacy. When one speaks about literacy, it does not mean one is referring to the English language, it is about acquiring communication skills, an important graduate skill, and one that is sought by employers in the workplace.

Similarly, in addition to the Mhakure and Mokoena (2011), and Ippolito *et al*. (2017) suggestions and reiterations, the author Machaba (2016) conducts research on the method in which Mathematics and Maths Lit students approach the solving of a mathematical problem. In the article, he provides a description of the skills required and acquired by both sets of students to solve the problem. He uses what he calls "..[s]trands of mathematical proficiency" (Machaba, 2016). His study highlights a valuable observation that although Mathematical Literacy is taught to expose students to contextual, everyday events, they are still required to have an understanding of mathematical principles. "That which gives mathematical literacy an identity cannot be divorced from mathematics" (Machaba, 2016). He supports the notion that Mathematics and Maths Lit should be combined. This is in support of one of the solutions to be proposed in this study that Maths Lit should also be offered to Mathematical students to enable them to acquire the same skills of dealing with real-life situations, the same skills the Maths Lit students acquire.

Spanenberg (2012) postulates that, depending on a student's character, their way of thinking and learning influenced their choice of taking either Mathematics or Maths Lit as a subject. However, she is also of the

opinion, based on her interviews, that teachers do not take these thinking and learning styles into account when assisting students to make a subject choice. Mostly, they rely on aptitude tests or the marks attained in Grade 9, the grade in which subject choices have to be made for Grade 10. This results in students changing their choices halfway through the year or even as late as Grade 11, before entering Matric. This information, although not directly pertaining to the study to take place, still has some bearing on the effect that self- efficacy has on the rate of success in the chosen discipline, either Mathematics or Maths Lit. Thus, if students have thinking and learning styles that are not suited to one of the subjects, frustrations and low self-efficacy could lead to the unsuccessful mastery of the subject. This literature is in contrast to the works of Chandler, Fortune, Lovett and Scherrer (2016), Ippolito *et al* (2017) and Machaba (2016) where they are of the opinion that Mathematics and Maths Lit should not be separated.

Chandler *et al* (2016) suggest that Mathematics should be more than just learning and applying content. Practical examples should assist in students making sense of the practical example and being able to communicate the results or information in an argument or discussion. The article goes onto explain that learning is traditionally assessed by means of test results. However, if literacy were to be combined in learning mathematics, a different form of assessment needs to be undertaken. Although the current study does not focus on students learning methods or assessments, the value lies in the fact that it supports the idea that literacy should also form part of the core principles of mathematics.

An inquiry into how Mathematics and Maths Lit students learned, and were motivated, is made by Baumgartner (2018). The authors found that the two sets of students used different learning strategies and engaged in different thinking patterns. Maths Lit students are less motivated to engage fully with the subject. This speaks to their perceived low self-efficacy. This is an additional study to Spanenbergs' (2012) article, confirming the different learning strategies. The study highlights the importance of taking different learning strategies into account when compiling the curriculum. It is also noted that self-efficacy plays a role in a student's Grade 10 subject choice. In addition, the authors suggest implementing an academic intervention when students begin their tertiary education. A limitation of this study is that it does not study the impact that taking Maths Lit has on the performance of taking accounting as a subject in the tertiary education space.

Kremmer *et al.* (2017) use a maths aptitude test to establish the maths abilities of first year commerce students. They are of the opinion that the test results can be used to predict a student's performance in

first year. The students are offered a workshop which teaches basic maths skills. The result is a positive one, Kremmer *et al*. (2017), finds that students perform better after attending the workshop. The reasons for this being, a basic maths skills acquisition and consequently a higher level of confidence. The study is significant in its findings as it provides a possible solution to increasing, not only the level of maths skills, but also the pass rates of first year students, in subjects such as Economics, Accounting and Science. The limitations of this, however, are, that the study was conducted in Australia and not in South Africa and it tested the students' performance in statistics and not accounting.

From different studies conducted, it appears that a student's self-efficacy has a bearing on their educational success. To support this statement, in their study, Joyce *et al.* (2006) conducted research on levels of anxiety around aspects of communication and maths skills. The study reveals that accounting students (with accounting as their major) display anxiety around communication skills. Whereas the Business students' (accounting not their major, but having to complete at least one year of accounting) anxieties are centred around their maths abilities. This is an important study as it will have some bearing on the research to be conducted. It has highlighted the fact that non-accounting major students do express some level of anxiety when they are required to complete accounting as part of their studies. However, the study does not specifically attribute a reason for this maths anxiety, it is unable to identify if the maths anxiety arose because the students had taken Maths Lit as a subject.

Another study conducted by Guner (2007) shows that a students' attitude towards a subject has an effect on the students' success in that subject. The study asks students to describe, using a metaphor, what they felt about mathematics, there are both positive and negative thoughts. There is a definite positive correlation between a positive metaphor and success. However, this studies' results cannot be used in the proposed study as it refers in particular to attitudes in Mathematics, but it still has validity in its support of the claim that a student's attitude affects the success or failure in a subject. Thus, the inference that this could apply to any discipline is going to be used in the study. Ozgen (2013) and Ozgen and Bindak (2011) refer to self-efficacy amongst students studying Mathematical Literacy. Surveys are conducted and it is established that a students' learning method has an impact on the students' self-efficacy. What this shows is that self-efficacy, in general, has an impact on the students' success in the mastery of the subject. To further support this, the authors, Aksu *et al.* (2015) use an array of empirical studies to determine the effect of different variables on the ability of the students to successfully complete Mathematical Literacy. One of these variables being, 'Self-efficacy'. The results of the study show that the belief a student has in

his/her own ability to do Maths Lit has a definite effect on a successful Maths Lit performance (Aksu *et al*. 2015). This tells us that self-efficacy is an important variable and the information obtained in this article is relevant to the study to be conducted. The limitation of this study, however, is that the study was conducted in Turkey and not in the South African Higher Education context. This does not, however, detract entirely from the fact that it is found that, self-efficacy is a variable that determines the successful completion of Maths Lit.

Dull, Schleifer and McMillan (2015) broach the topic of self-efficacy in accounting students. This a general comment on how accounting students learn, looking specifically at deep and surface learning. Students suffer anxiety when studying accounting due to different reasons, one being the perceived lack of mathematical skills. Although the article refers to Mathematics and not to Maths Lit, it explains in detail how self-efficacy can have an influence in the successful mastery of accounting. This will provide a background to the intended study (Bansilal, Mkhwanazi and Mahlabelas 2012).

Conclusion:

The literature available related to the study on whether Maths Lit impedes a students' ability to do accounting was analysed for purposes of this study. From this, the following conclusions may be drawn. There were various reasons for the introduction of Maths Lit at schools for Grades 10 – 12, the main one was to ensure that learners leave school with some degree or level of maths or numeracy (North and Christiansen, 2015; Vishal and Bishop, 2006). Employers are looking for employees who have literacy, numeracy skills, are able to understand and solve problems in the workplace (Joyce *et al.* 2006; Fitzsimons, 2017).

A theme that was evident from the literature, but had no direct bearing on this study, was that Maths Core and Maths Lit should not be offered as separate disciplines (Mhakure and Mokoena, 2011) but should be integrated. In this manner, not only would students learn abstract maths (Maths Core) but maths that could be applied to real-life situations (Mhakure and Mokoena, 2011; Ippolito *et al.* 2017; Machaba, 2016; Chandler *et al.* 2016).

In contrast, and more relevant to this study is the fact that students have different thinking and learning styles, and this influences a student's choice of Maths Core or Maths Lit at school (Spanenberg, 2012).

Teachers and students should take this into account when making the choice and at time of the study, this was not being carried out (Spanenberg, 2012). Being assigned to the incorrect Maths path could affect a student's self-efficacy (Spanenberg, 2012). According to Joyce *et al.* 2006; Ozgen (2013) and Ozgen and Bindak (2011); Aksu *et al.* (2015); Dull *et al.* (2015), a students' self-efficacy has a large amount of influence on how successful a student is at not only Maths but all other subjects.

3. Research Approach and Methodology

3.1 Research Paradigm

Stringer (2004) explains that the information found in the research literature is obtained by means of quantitative and qualitative research methods. As Creswell, Ebersohn, Eloff, Ferreira, Ivnakova, Jansen, Nieuwenhuis, Pietersen, Plano Clark (2016) discuss, in qualitative research, quality is determined by investigating the validity of questions, the practicality of the research and ultimately the effectiveness of the research conducted.

There are three traditions as mentioned by du-Plooy Cillers et al. (2018): Positivism; Interpretivism and Critical Realism. For purposes of this research, the second traditional research method, interpretivism was adopted. Interpretivism developed as a result from observing that positivism did not take into account that people cannot be treated and studied as simply objects. Each person is different, their perception of reality is different thus their actions and reactions are going to be different.

In other words, interpretivism can be said to be used to study social sciences, where human behaviour is studied in order to be understood. Epistemologically, the facts gathered will depend on people's interpretation of them. Ontologically, because interpretivism will take into account different people's interpretations, nature of being, or reality it is going to be subjective and subject to change.

Speaking metatheoretically, interpretivism means that theories are used to describe and then interpret the behaviour of a person in context of that person's circumstances.

Interpretivism's methodological position is such that interpretivists want to understand people, thus qualitative research methods are used, opinions are obtained from which conclusions and solutions can be deduced. Axiologically, interpretivism takes into account each person's unique way of thinking and these ideas are valued.

Research was conducted using qualitative methods. Students were interviewed to obtain their view or opinion on the matter of whether taking Maths Lit at school has hindered their ability to do accounting. Based on these results, an attempt was be made to establish, whether those taking Maths Lit were indeed hindered in their ability to do accounting.

Theory in Research can be described as concepts being described in a manner that is logical, in addition, the relationships between processes are included in the description (du Plooy-Cilliers et al, 2014). The inductive theorizing approach was used in the study as an aim of the research is to confirm a theory, and qualitative research findings was used to build a theory. As the interpretivism theory was followed, theories were important and played an important part in the research. Participants' behaviour was observed in order to establish, if any, the meaning people attach to their actions.

3.2 Type of Study

The intention of this study was to engage with students with a Maths Lit background in an effort to gain insight and understanding of their experiences and effects of taking Maths Lit at school, to facilitate this type of engagement a qualitative approach to the study was undertaken (du Plooy-Cilliers *et al.,* 2014). The researcher focussed on establishing a correlation between taking Maths Lit at school and the impact it had on a participants' confidence level in their perceived ability to do accounting (du Plooy-Cilliers *et al.,* 2014). du Plooy-Cilliers *et al.* (2014) discuss various types of research to be considered when selecting a study type to be utilised to conduct the research. The researcher's decision was to conduct the study utilising the correlational type of research. Correlational research is utilised to determine if a relationship exists between two variables (du Plooy-Cilliers, 2014).

3.3 Type of Approach

To conduct this study the researcher utilised a case study approach. The researcher's intention for this study was to acquire a deeper understanding of the effect that taking Maths Lit as a subject had on a students' confidence in his/her ability to complete Accounting at tertiary level. Suryani (2013) postulates that there are two popular qualitative research approaches, namely case studies and ethnographies. For purposes of this study the case study approach was chosen to conduct the study for various reasons. According to Suryani (2013), a case study method is utilised when observing a unit such as a person, group or community in order to establish their characteristics, so as to be able to analyse certain situations in relation to those units of study. Case studies are tasked with producing reports on experiences, offer evidence and not to generalise (Suryani, 2013). The credibility of a case study will be established throughout the study from the continuous interpretations and descriptions made during the study (Suryani, 2013).

When utilising a case study approach, several cases or situations are explored to gain a deeper understanding of the phenomena being explored (Suryani, 2013). As per Stake (2005) as cited in Suryani (2013) an important concept of case study is called 'triangulation' which entails a process that utilises multiple perceptions in order to clarify meanings and verify an interpretation that is repeated.

The data collection method used for this study complies with this type of qualitative research approach, the researcher conceptualized the topic; selected a particular phenomenon, research questions were decided upon; raw data was collected using the interview method; data was organised, classified, edited with patterns being established and finally interpretations of the data were made (Suryani, 2013).

White (2009) noted that by using a case study approach a researcher has the ability to create awareness on an issue that is normally not made known. Thus, the case study approach was considered applicable because the effect on a student's confidence by having to take Maths Lit is not always considered at tertiary level.

3.4 Time-Dimension

As data collection is a very important aspect of a research study, it is imperative that care is taken when collecting data, as, if it is incorrectly collected, findings may be declared invalid (du Plooy-Cilliers, 2014). Time is thus an important factor when designing a research study as this will impact findings. Important

aspects to consider are whether the study is considered a current or future study, whether the study will take place at a specific point in time (cross-sectional) or extend over a long period of time (longitudinal) (du Plooy-Cilliers, 2014). The researcher intended the observation and the obtaining of information to take place at a specific point in time and not over a longer period of time, thus a cross-sectional time-dimension was used. Due to the COVID 19 pandemic, the research process and the writing of the report was prolonged, with submission due dates moved to a later date (2-3 months later), in an effort to assist researchers in adapting to the new circumstances.

3.5 Population

A total group of persons displaying characteristics that are pertinent to the research is known as a 'population'. These characteristics are known as the parameters of a research study (Pascoe, 2014).
For the proposed research study, the population targeted were those that fell within the defined parameters.

For this research it would have included students who took Maths Core or Maths Lit as a subject in matric. However, the population would be too large to interview, necessitating a need to narrow the selection, which for this study meant a change to the parameters to include only a selection of students who took Maths Lit as a subject in matric, also known as accessible population (du Plooy-Cilliers, 2014).

The unit of analysis was comprised of students (du Plooy-Cilliers, 2014), and were selected from the private education campus in Bordeaux, a brand of the private education provider.

3.6 Sampling

Sampling may be defined, as stated by Pascoe (2014), as a selection of people (or as Pascoe refers to them, 'elements') that are representative of the parameter defined. The researcher utilised non-probability sampling to conduct the study at the private education campus, specifically the method of volunteering sampling (du Plooy-Cilliers, 2014).

The researcher prepared a message asking students willing to participate in the study to email the researcher. The participants were selected on a first-come, first-served basis, thus the first ten (10) to

volunteer and consent to be interviewed were selected. Students had to meet the criteria of having taken Maths Lit at school.

The sample size consisted of ten students who had taken Maths Lit as a learning subject at school (du Plooy-Cilliers, 2014).

The researcher was aware of the risks when selecting a sample in such a manner as results tend to be unreliable, as volunteers participate for a reason, such as volunteering because an incentive to do so was offered or an opportunity arises to express unhappiness or displeasure (du Plooy-Cilliers, 2014).

With this in mind the researcher ensured that no incentives were provided and any expression of happiness or unhappiness needed to be motivated by a reason, which the researcher took cognizance of when interpreting the data.

3.7 Data Collection Method

The researcher interviewed the sample of participants to gather data. The interviews were to be conducted at a private education campus in Johannesburg. However, due to the lockdown that prevailed due to the Covid-19 pandemic, the interviews were conducted via the private education provider's teaching platform. A pre-prepared list of four open-ended questions were posed to the participants and opportunities given for participants to expand on their answers. The intention was to allow participants to be given the opportunity to provide responses that were detailed and thoughtful. The researcher asked open-ended questions to ensure that a participant was able to provide their opinion in regards to the questions asked. A closed-ended question would not have contributed to the meaningful depth of the answers as much as an open-ended question would.

The researcher conducted the interviews in an informal manner in an effort to make the student comfortable in answering the questions while at the same time gaining their trust (du Plooy-Cilliers *et.al.*, 2014).

The interviews were recorded to ensure that the information gathered at the interviews was not lost nor misinterpreted (du Plooy Cilliers *et.al.* 2014). The open-ended questions type of interview allows for easier

analyses of the different participant's opinion (du Plooy-Cilliers *et.al.* 2014). The interview collection of data method permitted the researcher to acquire a deeper understanding of the participants' feelings and views (Hofisi, 2014).

Refer to Annexure A for the interview questions posed to participants.

3.8 Data Analysis Method

The researcher was guided by the research aims when processing information gathered (Bezuidenhout and Cronje, 2014). Using raw data collected, the researcher identified themes that were evident in the information collected, and modified it into general information (Bezuidenhout and Cronje, 2014).

The researcher adopted a systematic approach in categorizing meaningful raw data (Bezuidenhout and Cronje, 2014). To achieve the best results eight steps have been identified by and referred to in Bezuidenhout and Cronje (2014).

The first step was to prepare data obtained from the notes and recordings, which was then transcribed in text format, the researchers' intention was to identify themes obtained from the information provided by the participants (Bezuidenhout and Cronje, 2014). This was followed by the development of selective coding units to further analyse the data (Bezuidenhout and Cronje, 2014). Themes were identified in each question and allocated a code, for example, the theme 'Time' in question 1 was allocated code '01', the second theme in that question was allocated code '02' and so on. The codes identified were used to highlight the most and least common responses to each question, facilitating the interpretation of the answers. The third step comprised the development of categories to which the coding was applied and which linked perceptions that were common as well as identifying contrasts. Fourthly, the reliability of the chosen coding was tested; all data was coded; coding consistency was assessed followed by the seventh step, which was the interpretation of the data and finally the last step was reporting of the findings.

The method used by the Researcher was aimed to bring structure, order and meaning to the method used and the subsequent data collected, aligning it to the purpose of the study (du Plooy-Cilliers *at al.* 2014).

As a first step, the researcher constructed a key in order to identify the respondents, their names were not revealed to comply with the confidentiality clause on the consent form which was signed by each respondent (Please refer to Appendix B (1) for the respondent key).

The second step involved the collection and recording of responses from every respondent for each individual question. This method allowed the researcher to visually contextualise the responses received. A full analysis is available in Annexure B (2).

4. Findings and Interpretation of Findings

Patterns in the responses were identified by the researcher, the findings and interpretations of which follows:

A total of ten (10) students studying at a private higher education institution in Johannesburg, voluntarily participated in the study. The criteria they were to meet was they had to have taken Maths Lit in High School. It was agreed from the outset that their identities would remain confidential. The participants were selected on a first come, first served basis and as participants were asked to volunteer, no parameters such as being either male of female were set, however, the first ten respondents happened to comprise five (5) females and five (5) males.

Interviews were conducted with each participant at their convenience. The information obtained from these interviews provided the researcher with greater insight from the perspective of each participant. There were similarities between what the participants stated with some of the literature and as not much research is available to see the effect that Maths Lit has on the ability to do accounting, new information was obtained. This information cannot be considered as a stand-alone conclusion, further research into different aspects needs to be conducted, this is discussed after the findings presented in the next section.

Theme 1: Reasons for changing from Maths Core to Maths lit

The first question asked the respondents to detail their reasons for dropping Maths Core and taking up Maths Lit as a subject, either at the start of Grade 10; in Grade 11 or even in Matric (Grade 12). The respondents' attributed the change from Maths Core to Maths Lit to various reasons, namely: the inability to cope with the Maths Core workload; the difficulty of Maths Core; the fact that the Maths Core teachers were unapproachable or that neither the teachers' extra help nor tutor extra lessons were able to assist in understanding Maths Core.

Figure 1.1 indicates that the most common responses to this question were that Maths Core was time consuming, and participants felt incapable of coping with the work and demands of Maths Core. 50% of the respondents indicated that both these factors contributed to their decision to change to Maths Lit. One respondent replied that the only reason for change was that Maths Core was time consuming while 2 respondents replied that it was only because they were unable to cope with Maths Core. Only 1 respondent replied that all four reasons (cited above) contributed to the change to Maths Lit. The one respondent cited reasons as being lack of time for Maths Core; inability to cope and the inability of teachers or tutors to assist in understanding Maths Core. The last respondent replied that 3 of the reasons with the exception of Maths Core being time consuming contributed to the decision to change to Maths Lit.

Only one respondent replied that she was asked to change to Maths Lit at the end of Grade 9 as the teachers were of the opinion that she would not cope with Maths Core for the Grade 10 - Grade 12 school years. The other nine respondents replied that the decision was theirs, with some respondents saying the decision was taken after consultation with the teachers.

Guner (2007), and Whyte and Anthony (2012), discussed that if disinterest in, or fear and anxiety over a subject existed it affected the students' success rate in that subject. The study focussed on attitudes towards Maths Core and may be extrapolated to all subjects undertaken to be studied. Furthermore, Spanenberg (2012) postulates that a students' own particular thinking and learning style have an effect on their ability to cope and complete either Maths Core or Maths Lit. Spanenberg (2012) observed that many teachers did not take these thinking and learning styles into account when assisting students in making their choice of Maths subjects for Grade 10, this consequently impacts on a student's self-efficacy in their ability to do Maths Core.

Madongo (2007) explores the idea that Mathematics is the more difficult subject and students do find it a challenge to cope with the work presented. A new concept that became prevalent during the interviews was students who were struggling to cope with Maths Core found that they were spending a lot time on the work leaving less time for the other subjects they had taken.

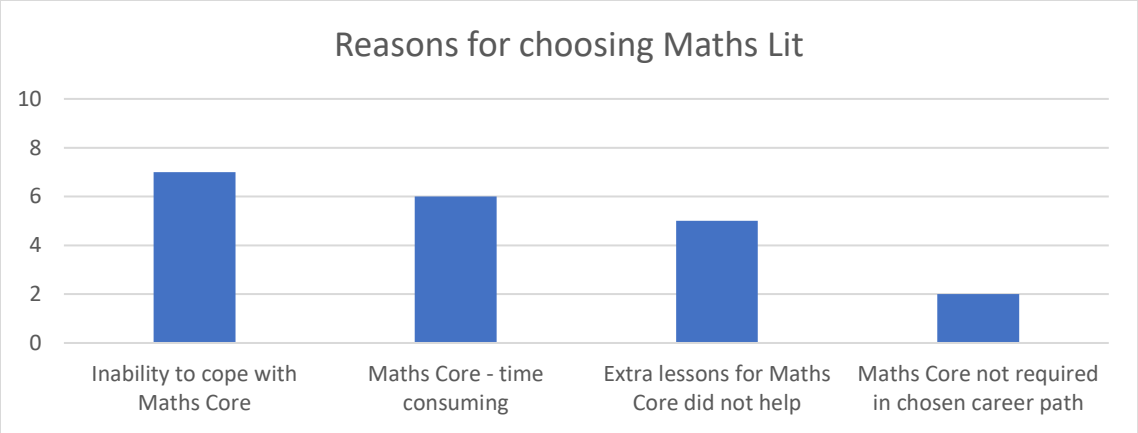

Figure 1.

Theme 2: Thoughts on Maths Lit

The second question was posed to students to explore their thoughts on Maths Lit as a subject.

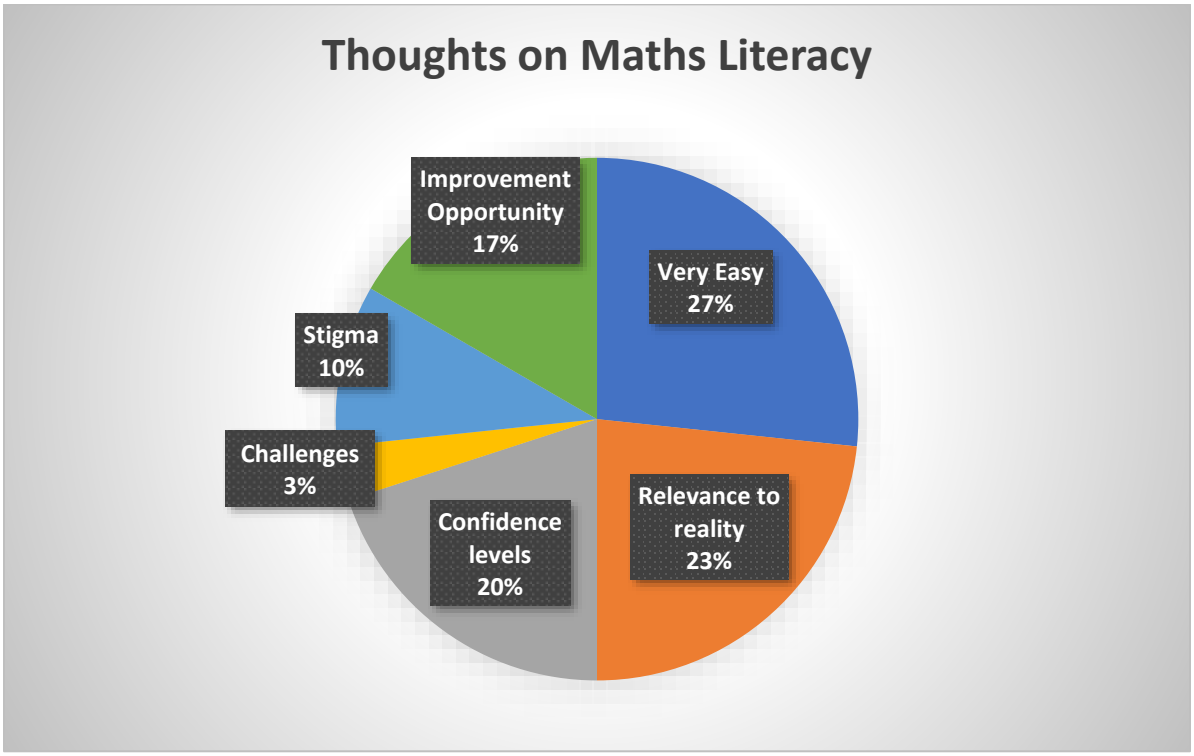

Figure 2

From the representation of the data in the Pie Chart depicted in Figure 2, it is evident that 80% of the respondents found that Maths Lit was easy. A second common response was that the Maths Lit content

to be learned was relevant to real-life situations. 60% of all respondents found Maths Lit both to be easy and relevant to real-life situations.

Another common response was that when the respondents changed from Maths Core to Maths Lit, their overall confidence in their own abilities increased. 60% of the respondents replied their confidence levels increased, with 2 students adding "…*I no longer felt stupid*". More time available and confidence levels increasing were a major contribution to the increase in the marks of their other subjects, 50% pf the respondents reported that their overall marks at school increased. One respondent proudly replied '… *I was able to obtain my academic colours at the end of Matric*'.

Only 1 respondent who had changed to Maths Lit at the beginning of Matric replied that Maths Lit was too easy and not sufficiently challenging for him. This was the least common answer received during the interview process.

30% of the respondents noted that although they were happy changing to Maths Lit, they did find that there was a certain amount of stigma attached to the change. They felt their peers tended to '*look down'* on them once the change had been made.

Madongo (2007) posits that Maths Lit is an easier subject than Maths Core and students are better able to cope with the work and demands of Maths Lit than they are in coping with Maths Core. One student in the study found that Maths Lit was too easy and this same finding is to be found in what students felt in the article by Madongo (2007). Furthermore Mbatsha (2013) supports this idea when he concluded students perceive Maths Lit as an easier subject, this has a positive effect on their self-efficacy, their confidence levels increase and this had an overall positive effect on their outlook for maths in particular.

There is a link between self-efficacy (a belief in one's own ability) and doing well in different subjects, (Is Guzel and Berberoglu, 2010). Aksu *et al.* (2015), Dull *et al.* (2015), Guner (2007) and Venkat, Graven, Lampen and Nalube (2009) all concur that a student's self-efficacy plays a very important in the success of overall results for not only Maths but for all subjects.

Bansilal (2017) postulates that Mathematical Literacy is a valuable subject as it relates problem solving to real-life situations, preparing a student who might not have the capability to complete Maths Lit, an advantage in having the confidence to work out real-life problems. Venkatakrishnan and Graven (2012), re-iterate this advantage in completing Maths Lit, the ability to function and solve real-life problems. This is agreement with the finding that students found Maths Lit a real-life relatable subject.

Theme 3: What are your thoughts on Accounting at tertiary level?

When respondents were asked what they thought about Accounting 1A at tertiary level, 90% of the respondents were enjoying it despite two respondents initially feeling some trepidation at the beginning of the course. Two respondents confirmed they preferred Accounting at tertiary level, more so than at school.

The most common responses were one of enjoyment, comprehension and confidence in their ability to complete accounting (see Figure 3). The one respondent said she understood the work better and this motivated her to work on accounting to do well. 60% of the respondents were of the opinion that the work was manageable with 60% feeling that they understood accounting better at tertiary level. It is important to note here that not all the respondents had taken accounting at school, only the few who had, were able to compare their experience at school to their experience at tertiary level. This comparison was not part of the study and was recorded as extra information that materialised from the interviews conducted.

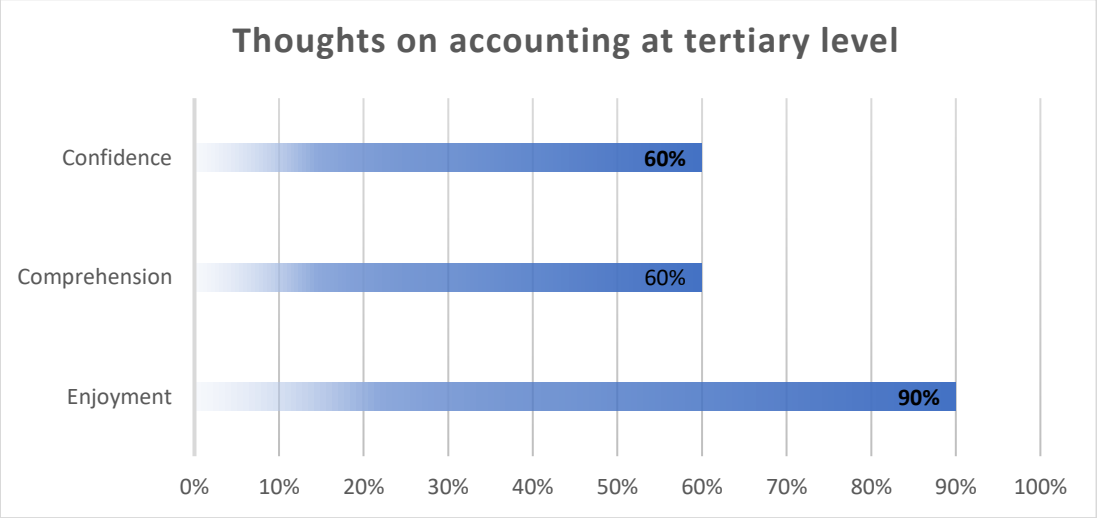

Figure 3

The respondents said they were enjoying accounting because they understood it, it was manageable and they felt confident in their ability to successfully complete the 1st year module. As was highlighted in the interpretation of the answers for Question 2, having changed to Maths Lit has had the effect of increasing the participants' confidence in completing not just Maths Lit, but other subjects too (Is Guzel and Berberoglu, 2010). Guner (2007) and Baumgartner (2018), emphasized that confidence levels increased

when work was understood and this led to the motivation and enjoyment of the subject being studied. At the inception of this study, it was stated that students might feel that they would not be able to complete accounting because their confidence levels and self-esteem were low due to the fact that they had Maths Lit as a subject at school. The interviews reveal that this does not appear to be the case, the findings are showing that there was an actual increase in confidence or self-efficacy, this is in support of the literature by Aksu (2015), Dull *et al.* (2015) and Venkat *et al.* (2009) who maintain that once a concept is understood, fear and anxiety over the subject are overcome, confidence increases and the enjoyment of the subject is the product.

This is evident in the literature by Mbatsha (2013), when students feel less anxious, understand concepts, are able to manage the work, their confidence levels increase and they are not only able to improve their marks in Maths (as such) but in all other subjects too.

Theme 4: Do you feel Maths Lit prepared you for accounting at tertiary level?

The last question respondents were asked to answer was to reflect on whether Maths Lit at school had, in any way, prepared them for accounting at tertiary level.

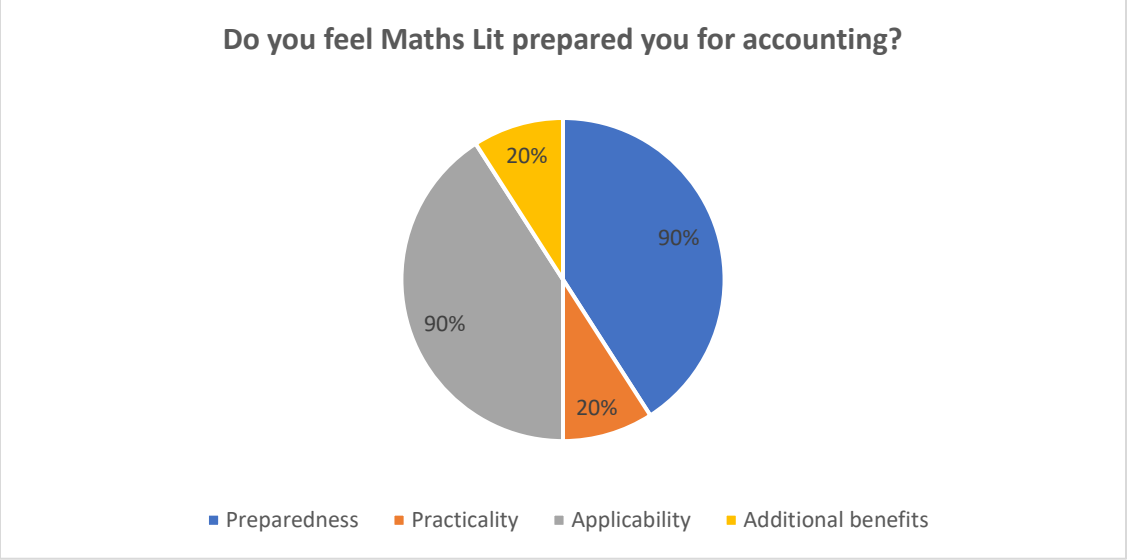

Figure 4

From Figure 4, it is evident that there was an overwhelming consensus among the respondents that taking Maths Lit at school prepared them for Accounting at tertiary level. 90% of the respondents answered in the affirmative with one respondent replying '*It **definitely** prepared me for Accounting'*.

Only one respondent was of the opinion that it had not prepared him. Interestingly enough, it was the same respondent who answered that Maths Lit was too easy and did not present enough of a challenge, he was also the only respondent who said he regretted changing to Maths Lit in Matric, as he was unable to follow the career he wanted to as he needed Maths Core as an entry requirement to study what he initially wanted to study.

Two of the respondents (20%) thought that because Maths Lit was a practical subject, it has helped them in Accounting, as it too, is a practical subject. With respect to the applicability of Maths Lit content to Accounting, 90% of the respondents replied that they had already learned concepts such as VAT; Cost price, Selling price and the calculation of percentages in Maths Lit. They felt that this had given them an advantage when studying Accounting as they had already learned and understood those concepts which made it easier to adapt to Accounting. Only one respondent did not mention the applicability of Maths Lit concepts to accounting.

The practicality of Maths Lit and additional benefits of studying it were the least common responses. Two students responded that Maths Lit taught them concepts in other subjects that were now helping them at tertiary level, an example of which is, Economics. In Maths Lit they were taught the basics of demand and supply, concepts that are learned and expanded on, at tertiary level.

Once again, available literature, although it does not specifically refer to the ability of a Maths Lit student to do accounting, refers to a students' confidence level increasing in Maths Lit which consequently has the effect of increasing a students' confidence in completing and enjoying other subjects (Guner (2007); Aksu (2015); Dull *et al.* (2015); Venkat *et al.* (2009). This can be extrapolated to include accounting. Guner (2007) assert a student's understanding of subject concepts contributes largely to the successful completion and enjoyment of the subject.

Houston, Singh, Ntenza and Hough (2014), explain the concepts that are included in Maths Lit to be learned and one of them is VAT (Value Added Tax) calculations. Houston *et al.* (2014) researched quality assurance in Maths Lit and they concluded that concepts such as VAT are introduced in Maths Lit to assist students in their ability to relate to concepts used in every day life situations. This ability to calculate VAT, selling and cost price was a point that was highlighted in the interviews. Students felt they had an

advantage when taking on accounting as they already knew how to calculate such mathematical concepts, thus simultaneously boosting their confidence in their ability to do accounting. The participants views align with the relevant literature, and increased confidence and ability levels in the participants was observed.

4.1 Conclusion and Recommendations

Main Objective: Determine the effect Maths Lit has on a student's confidence or self-efficacy

The study was thought of as being pertinent in an attempt to establish the reasons why the accounting pass rate at tertiary first year level is always so low. One of the reasons thought to contribute to the low marks was the fact that a large number of students studying at the tertiary institution had taken Maths Lit at school, either from Grade 10, or changing to Maths lit in Grade 11 or 12.

The researcher attempted to establish if there was a correlation between taking Maths Lit at school and the perceived inability to do accounting. It was thought that a students' low self-efficacy was the contributing factor to the low marks achieved with low self-efficacy being thought to be a consequence of having taken Maths Lit at school.

The study, however, revealed the exact opposite. Participants reported that their confidence or self-efficacy actually increased when the change from Maths Core to Maths Lit was made, they felt they were able to cope better with not only Maths Lit but it had a positive impact on their other subjects. The contributing factors were: more time was available to dedicate to other subjects and Maths Lit was more understandable and manageable. This finding, however, still does not explain the low marks achieved in accounting at tertiary level. Further research into the possible explanation for this is recommended.

When entering tertiary level, students felt only initial apprehension when having to do accounting, but when they realised that they had covered part of the content in Maths Lit, their confidence continued to increase and motivate them to work harder. This finding addresses the main objective of determining the effect Maths Lit has on a student's confidence.

Recommendation related to the main objective:

A more definitive finding could be attained if the sample size was larger. Due to the time constraints, the effect of the lockdown on the accessibility to more participants and the inability of interviewing them

face-to face, the sample size was kept small. The finding, however, encourages a more in-depth study to be carried out to establish if more students felt that their confidence had actually increased when taking Maths Lit and to be more representative of the population.

Sub-objective: Assess the possible perceptions regarding Maths Lit students' abilities and capabilities

The fact that students felt more confident instead of less confident was a worthy outcome, however, what this study did not reveal was whether a students' ability/inability and capability/incapability to do accounting was what caused the high/low marks. It was established from the sample size, which is by no means at this point regarded as being representative of the whole population, that confidence levels increased, but this did not translate into the participants achieving high marks based on their high levels of confidence alone.

Recommendation/s related to the sub-objective

Further quantitative research would be required to establish a correlation between confidence levels and marks achieved. A comparison of marks attained for accounting by participants who took Maths Core versus those who took Maths Lit, would add value to the arguments that Maths Lit is not a Maths subject, but a lower form of maths. Career choices are limited for students who take Maths Lit, the reason for this would be worthy of more research to establish the attributes universities and employers are looking for when they request that prospective students or employees have Maths Core.

5. Ethical considerations

According to du Plooy-Cilliers *et al.* (2014), ethics provides a guide to behaviours that are acceptable or unacceptable in the quest to conduct research. Yip, Han and Sng (2016) purport that humans are requested to participate in research studies as they are the sources of data. For this reason, researchers are required to protect the privacy and confidentiality of an interviewees' personal information (Yip *et al.* 2016). Confidentiality of participants was maintained for purposes of this study. Most of the participants were not averse to having their names used in the report, the researcher, however, decided not to use the participants names to ensure the highest degree of protection. This meant that participants were referred to as 'Respondent 1 through to Respondent 10'.

Yip *et al.* (2016), stipulate that participants are required to provide consent after being informed of the research process. Willingness to participate in the study should be documented by completing and signing a dated consent form (Yip *et al.* 2016). As consent forms are crucial to fulfil legal requirements, each participant was presented a consent form, which needed to be signed and returned to the researcher before the study was conducted. The consent form contained a further clause requesting permission to record the interviews, a requirement for the study.

du Plooy-Cilliers *et al.* (2014) maintain that participants must be fully informed about the study to be undertaken and they must consent to being interviewed, any confidential information must not be made public, furthermore, the participants must not be forced or coerced with any type of incentives to participate in the research. The researcher complied with the ethical requirements by not making any confidential information public and collecting signed consent forms from the participants.

Data was collected using interviews and, as du Plooy-Cilliers *et al.* (2014) stipulate, the interviews are required to be recorded. The required consent form was obtained to permit the researcher to record each participants' interview, ensuring that each participant was aware of the requirement and had no objections to the process.

The researcher applied for and was granted ethical clearance with the relevant institution to ensure no student would be advantaged or disadvantaged by voluntarily partaking in the research study (du Plooy-Cilliers *et*. *al.*, 2014). In accordance with ethical behaviour, the researcher did not distort the resultant information obtained from the interviews; did not allow bias to surface with the potential to influence the results; did not misuse information gathered and did not use inappropriate research methods (du Plooy-Cilliers *et al.*, 2014).

Throughout the study the researcher conducted ethical research to maintain the reputation and integrity of the academic institution. The researcher was committed to producing research that will benefit society; is credible and provides a better understanding of the effect that taking Maths Lit as a subject has had on their ability to complete accounting at tertiary level in their first year of study.

6. Limitations of the study

Limitations of the study may be defined as the characteristics of methodology or design that may have had an impact on the interpretation or even application of the results of the study (Sacred Heart of University Library, n.d.). The manner in which the study is designed or the method chosen to gather data may influence the findings, their utility and validity (Sacred Heart of University Library, n.d.).

The findings of this study have to be seen in light of some limitations. At the inception of the study, accessibility was identified as a possible limitation in the process of gathering data, where accessibility was thought to be the lack of time available for interviews to be conducted. However, when it was time to conduct the interviews, it coincided with the countrywide lockdown due to the COVID 19 pandemic. Access to the campus was not possible and face to face interviews were not able to take place and arrangements for interviews to take place online had to be scheduled. This arrangement did, however, eliminate the need to book an interview room and finding a suitable time in between classes to conduct the interview.

A qualitative research interview is regarded as an interview that purports to gather the life-experience of the interviewee in their interpretation of the questions posed (Opdenakker, 2006). Collecting these interpretations in a face-to-face interview has the following advantages: extra non-verbal information is added by the social cues the interviewer picks up from the interviewee, social cues such as body language or voice; there is no delay between the question posed and the answer provided; answers tend to be spontaneous and an ambient interview situation is easier to create (Opdenakker, 2006).

However, with the online interviews, the researcher was unable to discern whether the respondent was concentrating fully on the questions asked due to distractions, such as social media being accessed simultaneously, the interviews were shorter and the method did not always allow for a discussion to flow from the answers given. Respondents tended to answer questions in shorter sentences and to the point. To overcome this limitation, the researcher did frequently ask the participant to elaborate on the answer given. In further research on this topic, extra interviews could be arranged for a time when COVID 19 is no longer the threat it is currently posing.

A second limitation was the initial reluctance of some of the participants in volunteering to be interviewed. Several appeals were made with assurances that all information would be kept confidential and names were not going to be published, no incentives were offered, just an explanation that the study

was towards attaining the researchers' degree. However, once interview was being conducted, the initial apprehension was not apparent. Despite the researchers' attempt to make known the type of questions that were to be asked, some of the participants were under the false impression that calculations or problems were going to be asked of them, this contributed to their reluctance in volunteering. The researcher should have included the fact that no calculations would be required by the participants on the consent form. A further possible limitation is linked to the answers received to the question as to whether the students enjoyed accounting, this yielded mostly positive results with the participants replying they were really enjoying accounting. An element of possible bias has to be factored into the report, as the researcher is the participants accounting lecturer. Interviews required for further research should be conducted by a third party who has no association with the accounting module.

du-Plooy Cilliers (2014) posit that a qualitative study is one that is time-consuming. Extensive time had to be allocated to the collection of data and its' analysis. Small sample sizes are typical for a qualitative study as, Scared Heart of University Library (n.d.) observes which means that they could be too small to support valid conclusion claims. However, due to time constraints for the submission of the report, the COVID 19 crisis and the time needed to be allocated for data analysis, the sample size was kept small. Further studies could enlarge the sample size and include participants from more campus' in the study to ensure a representative distribution of the population. However, for the purposes of this particular study, given the constraints, the sample size was adequate.

The final limitation to be considered would be that this type of research is the first research the researcher has attempted and due to lack of experience, the method and conclusions could be flawed, despite the guidance received and studying undertaken.

7. Anticipated contributions of the study

Determining the impact Maths Lit has on studying accounting, has become important in South Africa. There has been an increase in the number of students changing from Maths Core to Maths Lit at school level, limiting the choice of degrees they are able to follow. Joyce *et al*. (2006) observe that a Maths Lit students' ability is perceived to be different by employers to those who took Maths Core as a subject. (Carvalho, 2019).

The research study attempted to determine and explore students' self-efficacy or their confidence in their ability to study accounting despite having taken Maths Lit as a matric subject (Baumgartner, 2018; Dull, Schleifer and McMillan, 2015; Carvalho, 2019).

Further research should be undertaken to establish the interventions that could be implemented to mitigate any negative findings that show Maths Lit students do struggle to complete accounting. Further research substantiating that thinking and learning styles have an impact on the choice of either taking Maths Core or Maths Lit may have an impact on how teachers and lecturers alike on how they adapt their teaching methods to ensure a students' learning experience is one that encourages life-long learning.

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9. Appendices

9.1 Annexure A: Interview Questions

1) Why did you choose Maths Lit as a subject?

2) How did you feel about Maths Lit as a subject? Please elaborate on factors that made you feel that way.

3) What are your thoughts on Accounting 1A?

4) Do you think Maths Lit prepared you for Accounting 1A?

9.2 Annexure B (1):

Key:

Respondent 1: Private education campus Student Maths Lit in Matric	**Respondent 6:** Private education campus Student Maths Lit from Grade 10
Respondent 2: Private education campus Student Changed to Maths Lit in Matric	**Respondent 7**: Private education campus Student Maths Lit in Matric
Respondent 3: Private education campus Student Maths Lit in Grade 11	**Respondent 8:** Private education campus Student Maths Lit in Matric
Respondent 4: Private education campus Student Maths Lit in Matric	**Respondent 9:** Private education campus Student Maths Lit in Grade 11
Respondent 5: Private education campus Student Maths Lit in Grade 11	**Respondent 10**: Private education campus Student Maths Lit from Grade 10

9.3 Annexure B (2): Data groupings

For each of the questions asked the following salient points by each respondent were documented:

Question 1: Why did you choose Maths Lit as a subject?

Respondent 1: The number of hours dedicated to Maths Core **did not allow** much **time** for **other subjects**, resulting in low marks.

Respondent 2: I was **unable to cope** with Maths Core, unable to spend more **time** on other subjects. **Extra Maths Core lessons** were **ineffective**

Respondent 3: My Maths Core teachers were **unable to assist** me in understanding Maths Core

Respondent 4: The Maths Core mark I attained was **weak**; I was **unable to spend time** on **other subjects** consequently marks were low

Respondent 5: I wanted to change to Maths list as it was **less stressful**

Respondent 6: I was asked by teachers to change to Maths Lit as my Maths Core mark was **weak.**

A lot of my **time** had to be spent on Maths Core, leaving less time for **other subjects**

Respondent 7: **Extra lessons did not help** in understanding Maths Core, and I was **not coping**. **Less time** was available for **other subjects**. I did not need Maths Core for my **chosen career.**

Respondent 8: **Extra lessons did not help** me understand Maths Core, I was **not coping nor doing well** in the subject, and was **unable to focus** on **other subjects.**

Respondent 9: Maths Core was **too difficult** and **extra lessons** did not help. I did not need Maths Core in **my career.**

Respondent 10: I **struggled** with Maths Core and my **marks were bad**.

The next step was to find themes and subthemes and code them:

Time • Too much time required for Maths Core • Insufficient time for other subjects	**01**
Coping • Unable to cope • Maths Core too difficult • Marks for Maths Core were low • Marks for other subjects were low	**02**
Assistance • Teachers were unable to help • Extra lessons were ineffective	**03**
Career options • Maths Core was needed in chosen career path	**04**

The next step was to derive a code and these are documented in the table shown after the last question listed below.

Question 2: How did you feel about Maths Lit as a subject?

Respondent 1: Maths Lit was **easier**, I was able to **understand concepts better** and the content was more **relevant to real-life situations**

Respondent 2: Maths Lit was **very easy**, perhaps **a little too easy.** Concepts studied were **relevant** to **real-life situations.** My peers **looked 'down' on** me for taking Maths Lit, my **confidence dropped** a little. Maths Lit did **not challenge** my thinking. I was **unable** to **enter public universities** and I **regretted** taking it.

Respondent 3: Maths Lit was **easy** and **more relevant to real-life situations**. My marks **improved** for other subjects.

Respondent 4: Enjoyed Maths Lit, but I **wanted more of a challenge**. Maths Lit made sense and was **more relevant to real-life situations**. My **confidence levels increased** when I realised I was able to do Maths Lit and I felt **more motivated**. My marks for other **subjects improved**. The only down side was that Maths Core students **looked 'down' on me.**

Respondent 5: It was an **easier** subject (Maths Lit) more **industry and real-life related**.

Respondent 6: Maths Lit was an **easier** subject, it was **practical** and **relevant to real-life**. Marks for my other subjects **improved.**

Respondent 7: The **workload** for Maths Lit was a **lot less** than for Maths Core, it was **practical** and more **relevant to real-life situations**. My **confidence increased** and I did better in my other subjects. All my marks for all subjects **improved**.

Respondent 8: I was able to see **good marks for Maths Lit** compared to marks for Maths Core, my **confidence increased** and I did **better** in my **other subjects**. But there was a **stigma** attached to Maths Lit students, we were looked **'down upon'**.

Respondent 9: **Confidence was boosted**, the Maths Lit work was **manageable**, I felt **motivated** and marks for all my subjects improved, but there was a **stigma** attached to taking Maths Lit as a subject.

Respondent 10: I **enjoyed** Maths Lit, felt it was a more **practical and related to real-life situations** kind of subject.

	05
Ease • A much easier subject • Left time for other subjects • Manageable	

Relevance to reality • More relevant to real-life situations • More practical	**06**
Confidence • My confidence levels increased • Motivated to work • Confidence levels decreased	**07**
Challenges • It was too easy – no challenge	**08**
Stigma • Maths Lit students are looked 'down upon' by peers who take Maths Lit	**09**
Improvement opportunity • Marks for other subjects improved	**10**

Question 3: What are your thoughts on Accounting 1A?

Respondent 1: Accounting is teaching me to manage my finances. It is a **manageable** subject and I am **enjoying** it.

Respondent 2: Initially I felt intimidated by the prospect of studying accounting, but I am now **enjoying** it. It is a **logical subject** and because he is **understanding** it, he feels **more confident**.

Respondent 3: When I compare Grade 10 accounting to 1st year accounting, I **did not enjoy** it in Grade 10. I was not encouraged to do well in school accounting but I feel **more confident** now at tertiary level.

Respondent 4: I am **more confident** in my ability to complete accounting at tertiary level and I am **enjoying it**.

Respondent 5: I was initially nervous but I feel **more confident** now and I am finding it **easier** than at school.

Respondent 6: **Basic accounting concepts are being taught** in accounting at tertiary level and once you **understand i**t, you are able to do it. I am learning a lot and I am **enjoying it**.

Respondent 7: I am **understanding** it and I am actually **enjoying it**.

Respondent 8: I disliked accounting at school but I am **enjoying it** at tertiary level. I am happy that basics are being taught and it is helping me **understand** it better. I also feel because **basics are being taught** no student is at a disadvantage if they had never done accounting at school.

Respondent 9: I am **enjoying** it and I am **driven to do well** in this module.

Respondent 10: I was concerned initially but I feel **confident now**. The first 3 Learning Units were easy but it is getting progressively harder, but I am **not concerned about the challenge**, because working on it every day is helping me **understand** it and I am **enjoying it**.

Enjoyment • Enjoying it more at tertiary level • Did not enjoy it at school	**11**
Comprehension • Understand it better at tertiary level • It is manageable • Basics are taught	**12**
Confidence • Feel more confident at tertiary level • Motivated to work	**13**

Question 4: Do you think Maths Lit prepared you for Accounting 1A?

Respondent 1: Maths Lit **did prepare** me for accounting at tertiary level, it teaches students not to overthink problems, but approach them in a **logical manner.** In Maths Lit I was taught **concepts** such as **calculating VAT; Cost Price; Selling Price** which are taught at tertiary level and I felt happy that I **knew those concepts already**.

Respondent 2: I **do not think Maths Lit** helped me in accounting, apart from teaching me to calculate **basic concepts such as VAT and percentages**. I **do not think** Maths Lit **challenged my thinking** and **solving** of problems.

Respondent 3: Maths Lit **did prepare** me for accounting more so than Maths Core would have done. I was taught **formula**'s, how to **calculate percentages** and **VAT** and these are used in accounting.

Respondent 4: I feel Maths Lit **helped prepare me** for accounting at tertiary level as Maths Lit had a **'financial' section** where we were taught **to calculate VAT** and **percentages**, but I do wish Maths Lit had delved into the financial section a bit deeper.

Respondent 5: Maths Lit and accounting are **practical subjects**, so I **feel prepared** to take on accounting at tertiary level.

Respondent 6: Maths Lit **definitely prepared me** for tertiary level, I was **not only** taught **accounting** concepts but also **Economics** concepts which are both taught at tertiary level. I think the content you learn in Maths Lit is information **you can use**.

Respondent 7: The **accounting mindset** is **similar** to the Maths Lit mindset and thus Maths Lit **did prepare** me for accounting at tertiary level. I was **taught financial calculations,** such as **VAT; Cost Price and Selling Price**. My **anxiety** for accounting was **lessened** because I was taught basic concepts in Maths Lit.

Respondent 8:. I feel I had an **advantage** at tertiary level because I took Maths Lit and not Maths Core, as Maths Lit had a **financial section** and I was taught **VAT; Cost Price and Selling Price** calculations.

Respondent 9: Maths Lit **did prepare** me for accounting as it taught me **to read questions carefully** and **correctly** in order to answer them well, something like word sums. I feel this is an **important skill** in accounting.

Respondent 10: **Not all** the Maths Lit content helped her in accounting, the financial section did, as I was taught to **calculate VAT; percentages** and **interest**. I do not think that taking Maths Lit or Maths Core would have **either a positive or negative effect** on my ability to do accounting as the playing fields are levelled when you study at tertiary level. Maths Lit did however **help** me at school level **with other subjects** such as Geography and at tertiary level it has helped me with Economics.

Preparedness • I was prepared • I was not prepared	**14**
Practicality • Maths Lit and accounting are practical subjects	**15**
Applicability • Able to apply the financial section taught in Maths Lit to accounting at tertiary level • Helped to understand accounting questions • Minimal assistance for accounting	**16**
Additional benefits • Maths Lit helped in understanding other subjects at school and tertiary level	**17**

Writing out of the code:

	Question 1	Question 2	Question 3	Question 4
R1	01;	05; 06;	11; 12	14; 15; 16
R2	01; 02; 03	05; 06; 07; 08; 09	11; 12; 13	14; 16
R3	03	05; 06; 10	11; 13	14; 16
R4	01; 02	06; 07; 09	11; 13	14; 16
R5	02	05; 06	13	14; 15
R6	01; 02	05; 06; 10	11; 12	14; 16; 17
R7	01; 02; 03; 04	05; 06; 07; 10	11; 12	14; 16
R8	01; 02; 03	07; 09; 10	11; 12	14; 16
R9	02; 03; 04	05; 07; 10	11; 13	14; 16
R10	02	05; 07	11; 12; 13	16; 17
Most common response	**01; 02**	**05; 06**	**11; 12; 13**	**14; 16**
Least common	**04**	**08**	**N/A**	**15; 17**

9.5 Annexure D: Consent Form

Welcome

The purpose of the interview:

There has been an increase in the number of students taking Maths Lit instead of Maths Core as a subject at school. Maths Lit was introduced to ensure that students leave school with some form of Maths as many students find Maths Core difficult. This semi structured interview aims to investigate students' opinion on Maths Lit as a subject.

Explanation of the interview process

- I am interested in your personal experience, there is no right or wrong answer and I am not here to judge you in any way.
- The interview will take approximately 15 minutes
- Names of interviewees will not be used in the research report

Review and confirm the consent form

- Due to the COVID lockdown, your signature will not be attainable, to overcome this problem, please tick the box at the end of this form in lieu of your signature. This will serve as your consent to being interviewed.
- If you agree to the interview being recorded please tick the second box.
- In addition, I want to remind you that this interview is confidential and that your personal details will be kept private.

Thank you for your time and being willing to take part in the interview. Your feedback is highly appreciated.

Please place a '✓' if you agree to the conditions below or '✗' if you don't agree.

I agree to be interviewed by Carmen Carvalho ☐

I agree to the recording of the interview ☐

Please indicate which dates and times will suit you (please give me at least 4 suitable times) and I will get back to you with a confirmation and the link to the meeting I will set up.

Monday 18 May					
Tuesday 19 May					
Thursday 21 May	13.00 – 13.30	13.30 – 14.00	14.00 – 14.30		

I would greatly appreciate it if you could please send this consent form back to me asap and I will confirm date and time based on availability.

Regards Carmen