

Freshman student perceptions on intrapersonal skills required for their academic success

Arthur J. Swart

Central University of Technology
Bloemfontein, South Africa

ABSTRACT: Intrapersonal skills include the ability to accommodate authority and regulate emotions, which includes two key factors; namely, time management and motivation. The purpose of this article is to present freshman engineering student perceptions on what they think is personally required to achieve academic success when considering these two factors. A time-lag study (2016-2018) is used to gather quantitative data from 626 freshman engineering students using an on-line assessment. Results indicate that students need a study plan at the start of a semester, and they need to create a routine time and place to study as part of their time management skills. 83.6% of the students indicated that their academic success would depend on their own attitude that is related to motivation. A potential challenge to the academic success of these freshman students would be in satisfying their physiological needs. These perceptions may help academics identify more appropriate student support mechanisms that they can suggest at the start of a semester in addition to the disciplinary knowledge of the module that they will share with their students.

Keywords: Academic student support, deficiency needs, time management tools, self-regulation theory

INTRODUCTION

I think that if you've got a great support system around you, and a great family, and a tight team around you, I think you don't get lost [1].

These words, by a British musician, Rita Ora, emphasises the need of a good support system to reach specific goals in life and not get lost along the way. Freshman engineering students especially need this support system, as they transition from a high school environment into the higher education landscape.

First-year or freshman, engineering students often face a steep learning curve during this transition period as they have to contend with new curricula, new lecturers, new surroundings, new friends, new ways of learning and new responsibilities [2]. It has been noted that school learners do not always consider engineering to be a possibility, as they have had little to no exposure of engineering in their schooling career [3]. So, when students do enrol for engineering courses, for whatever reasons they have, they should be given more academic student support than usual. Numerous programmes have been established in engineering to attain this goal, including supplementary instruction [4] and a peer mentorship programme [2]. Indeed, evidence supports the idea that academic student support for engineering students is more imperative than for other students in higher education [5].

A key member of a student's support system includes the academic. Academics should provide additional academic support to their students as they are in regular contact with them, exerting a measure of influence over them [6]. Gomez-Rey et al support this as they highlight the importance of student support by academics and administrative staff alike [7]. Providing student support services enables students, and especially disadvantaged ones, to overcome their lack of information and become more prepared for their future academic work. An academic can achieve this at the start of a semester by promoting student engagement, not only with the course content, but also with content relating to academic student support that considers relevant intrapersonal skills.

Intrapersonal skills relate to metacognition, conscientiousness and self-direction, while interpersonal skills relate to communication and collaboration with others [8]. Intrapersonal skills include time management, stress management, change management, transforming beliefs, transforming character, creative thinking processes, goal setting and life purpose [9]. This article only considers motivation (linked to change management, goal setting and purpose) and time management due to their well-established impact on education.

Research has shown that poor time management skills usually results in poor academic achievement [10], while motivation plays a significant role for students to complete their qualification successfully [11]. Time management is further considered to be one of the most important characteristics of successful students in higher education [12], while a lack of motivation is one of the most critical factors affecting learning, and especially in historically disadvantaged institutions [13]. This is very applicable to this research that presents the perceptions of freshman engineering students at the Central University of Technology (CUT) in South Africa (SA), which may be classified as a historically disadvantaged institution.

The purpose of this article is to present freshman engineering student perceptions on what they think is personally required to achieve academic success when considering time management and motivation. This may assist an academic to better understand and address unrealistic expectations in this regard at the start of a semester. The article firstly considers the theoretical framework followed by the context and methodology. Quantitative results and conclusions are then presented.

THEORETICAL FRAMEWORK

The theoretical framework is built on the self-regulation theory. The first branch of self-regulation theory relates to *self-control* in amplifying or dampening behaviours towards achieving specific goals [14]. The social cognitive theory of Bandura has been linked to the self-regulation theory that consists of three sub-processes; namely, self-monitoring, self-judgment and self-reaction [15]. Self-monitoring relates to analysing one's own behaviours or actions, judging them as good or bad (self-judgement) with regard to acceptable standards, and then correcting them or modifying them (self-reaction), if necessary, in order to improve one's chances of success. This needs to be done with regard to various intrapersonal skills, as preconceived views of students in this regard may not always be accurate. This would require students to deconstruct their knowledge of these skills, and then re-construct it in line with widely acceptable learning strategies. This can be achieved by providing additional academic support to students in higher education.

According to Morgan, academic student support is support provided by academic staff that is based on academic decisions and is related to teaching and study problems faced by students [16]. Four types of academic student support are proposed [17]: *emotional* (stress reduction for new students, welcoming atmosphere, help in forming emotional bonds on campus), *informational* (student roles, programme requirements), *instrumental* (help solving academic problems, life skills, student advocacy) and *identity* (need fulfilment, self-efficacy, support groups, acknowledgement of cultural diversity). Helping students to identify required intrapersonal skills, in terms of appropriate time management tools and specific behaviours, that can help them to improve their chances of academic success, relates to the third type of support; namely, *instrumental*. It has been argued that, rather than providing direct instruction about predefined strategies or tools, academics should provide support that assists students to self-regulate their own learning effectively [18]. In other words, instead of telling students what intrapersonal skills to possess, help them to identify appropriate ones for themselves by giving them a selection of accepted tools and behaviours.

STUDY CONTEXT

The context of this research is limited to a module called Electronics 1, a compulsory module in the National Diploma in Electrical Engineering that was offered at CUT prior to 2019. This National Diploma is a national qualifications framework (NQF) Level 6 qualification that requires students to obtain a minimum of 360 credits (equates to 3,600 notional hours over a three-year period). Many modules in this Diploma have a credit value of 12, including Electronics 1. Approximately 300 students register for this module per semester, where each semester is approximately 14 weeks in duration. The syllabus of Electronics 1 covers theory relating to the oscilloscope, electrical basics, Thevenin's theorem, resistors, capacitors, diodes, transistors and the design of power supplies and amplifiers.

The results of this research focus on the first on-line self-assessment that these students need to complete within the first two weeks of a semester. It is uploaded to eThuto, the institutions learning management system build on the Blackboard™ platform [19]. Students are afforded three attempts to complete the self-assessment, as various network connectivity issues may interrupt them during a single attempt. Questions are formulated based on the specific sections that students had to read prior to completing the on-line self-assessment. Please bear in mind that students are monitoring their own actions (self-regulation) and determining (self-judgment), which tools/behaviours they need to personally implement (self-reaction) for themselves during the coming semester, so as to improve their chances of academic success.

RESEARCH METHODOLOGY

A time-lag study (2016-2018) is used to gather quantitative data from freshman engineering students using close-ended questions in an on-line self-assessment. Some students do not attempt open-ended questions as they often do not know what to say, which produces a lower response rate. Providing them with a predefined set of answers in a close-ended question makes it easier for them to respond in a quicker time, relating to time-efficiency. Time-efficiency is also achieved by the researcher, as close-ended questions may ease the analysis of the obtained data. The use of close-ended questions may have limited the strength of the responses or may be subject to bias. However, it can help both students and academics at the start of a semester to quickly identify appropriate academic student support mechanisms that may contribute to improved

academic success. The aim of the academic student support offered in Electronics 1 is not to explore student perceptions regarding intrapersonal skills, but to help them individually select the most appropriate tools/behaviours required to improve their chances of academic success.

In this research, an academic responsible for Electronics 1 shared his previous research relating to intrapersonal skills with freshman engineering students at the start of a semester. Students had to read specific sections of a conference paper published by the academic relating to motivation. One of the reasons for asking the students to read only a specific section of the paper relates to desire. Many engineering students do not like to read [20], and therefore, need more encouragement or incentive to do so. One way of encouraging them is by giving them smaller sections to read, with the hope that they will develop the desire to read more of the topic under consideration. Students also had to read specific sections of a journal article published by the academic that relates to time management skills. They then had to analyse their own actions (self-monitoring) considering this content, and then choose their own tools/behaviours (self-judgement) that they would want to amplify or strengthen (self-reaction), during the coming semester, in order to achieve the specific goal of completing this module. Student choices in this regard were captured by using an on-line self-assessment that contributed to the course mark of these students.

Questions were formulated from previous research of the author based on a list of eight time management tools [21] from which students had to select their top four that they believe would be required during the semester. Questions were also drawn from Maslow's hierarchy in terms of what students thought would be a challenge in terms of becoming motivated [22]. Instead of telling students what tools/behaviours they needed, they were rather asked to individually choose for themselves what they needed in terms of intrapersonal skills, which then forms part of academic student support. Student responses were reviewed by the academic in order to determine what further appropriate academic student support should be provided to these students. Questions relating to the demography, or profile, of the students was also covered in the self-assessment. Ethical clearance was not required by the university as the data was drawn from an on-line self-assessment that formed part of the module.

RESULTS AND DISCUSSIONS

The dominant home language of the students was Sesotho (this is indicative of the Free State province in SA, where CUT is situated). The dominant age group was between 20 and 24 years of age that validates them as freshman undergraduate students who have completed their secondary or high school career (average age for Grade 12 learners in SA is 18 years). Males outnumbered females by 3 to 1, which is still a challenge that needs to be addressed globally. Six hundred twenty-six students responded to all the questions and thus form the sample size.

Figure 1 highlights the results of student responses to the question on: *Which forms of behaviour can lead to poor academic achievement?* Recall that these students were first asked to read a journal article and conference paper relating to time management and deficiency needs. These publications presented research done among undergraduate African engineering students at another university of technology in SA, and were therefore applicable to these freshman students. The students were asked to rank the three given forms of behaviour according to priority. Poor time management skills took first place, with the absence of deficiency needs being reported as the third highest contributor to poor academic achievement (134 students ranked it in third place). Research has shown that poor time management skills usually results in poor academic achievement [10], and therefore needs to be addressed in terms of appropriate tools that students can use to overcome this challenge. Although stress or anxiety also impacts negatively on academic achievement, it was not considered in these results due to space constraints.

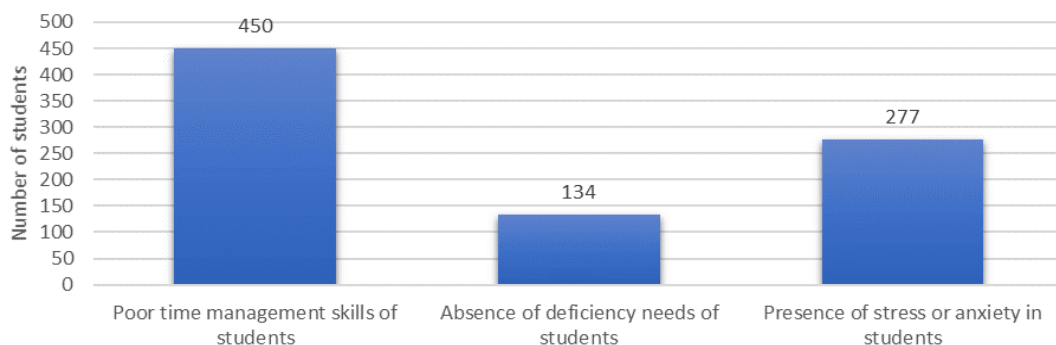


Figure 1: Forms of behaviour leading to poor academic achievement.

The conclusion section of the conference paper that the students were asked to read prior to completing the on-line self-assessment listed eight appropriate time management tools. These tools were identified by Swart et al and are shown in Figure 2, where students had to select their top four in order of priority [21]. The top two tools chosen by these freshman students, where to *implement a study plan* (586) and to *create a routine time* (466) for studying. It does seem to suggest that the routines or habits of these students need to be modified if they are to achieve academic success through their higher educational career.

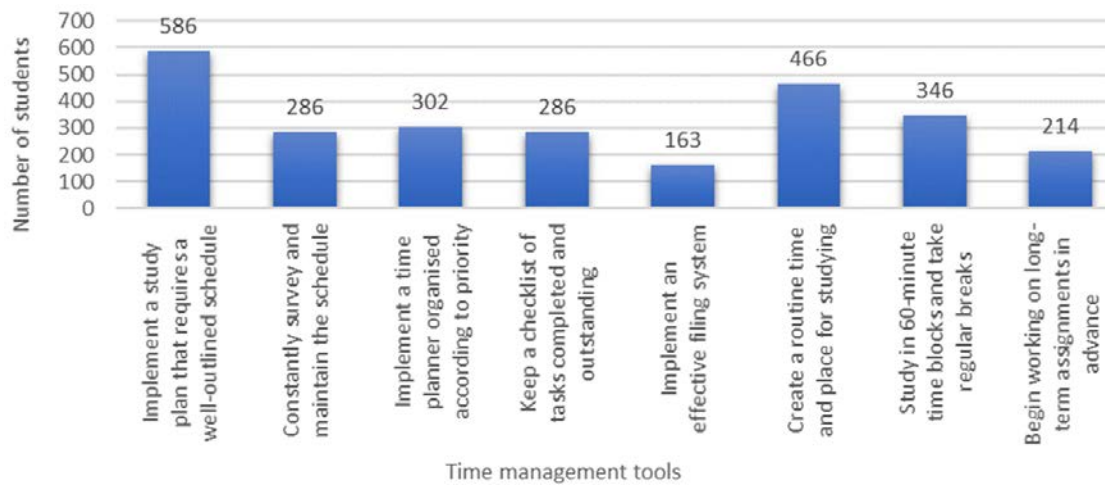


Figure 2: Top time management tools selected.

The academic in this module attempted to address this need by briefly discussing two practical study plans with his students after the first on-line assessment had been completed. The first plan is for a morning person, and the other for an evening person. In the common vernacular, *morning person* or *early bird* versus *night person* or *night owl* are reflections of the extreme ends of chronotype. In biological terms, chronotype refers to the individual difference in preferred timing of sleep and wakeful activity that differs from person to person [23]. Two completely different study plans are therefore shown that these freshman students can either select or adapt, to fit their own personal circumstances.

Figure 3 shows the results of student responses regarding which deficiency (or basic) needs may prove challenging to satisfy during the semester. Again, students were asked to rank the four given options according to priority. The dominant need that could prove challenging to satisfy would be their physiological needs, followed in second place by esteem. Physiological needs relate to shelter, food and exercise, while esteem relates to respect, status and recognition. These two needs form the first and fourth levels of Maslow's hierarchy. However, all four levels need to be satisfied before students can move to the fifth level of self-actualisation, where one can become motivated to reach one's full potential. Students must satisfy their psychological needs when learning [24] and they must satisfy their personal/social deficit needs before progressing to meet higher level needs, such as career/vocational and educational/academic needs [25]. The importance of eating just one apple or having a small bowl of porridge in the morning should be emphasised on a regular basis, as is done by the academic in this Electronics module. The academic also regularly encourages the formation of study groups, and especially in preparation for the weekly on-line self-assessments that are scheduled throughout the semester. These study groups can help to bolster the esteem of many of these students who find themselves in a class full of strange students who they may never have interacted with before.

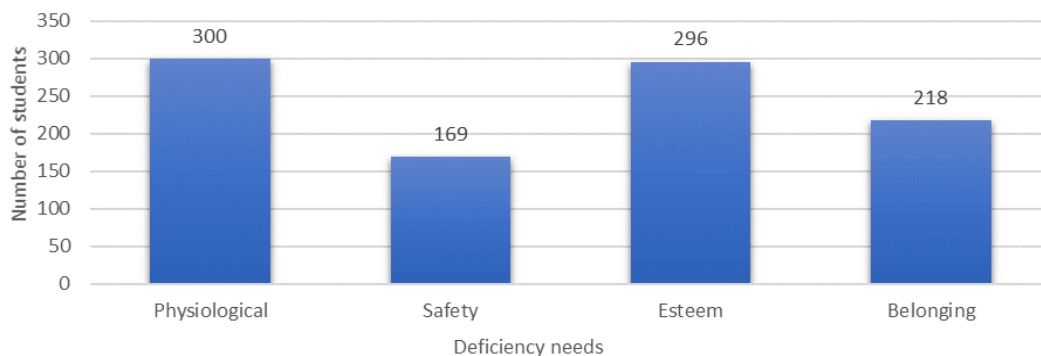


Figure 3: Basic needs that may prove challenging to the freshman students.

Students were then asked: *Which one of the following do you think has the biggest effect on your success at the Central University of Technology?* It was encouraging to see that the majority selected *Attitude*, with only 16.4% selecting *Circumstances* (see Figure 4). Attitude relates to motivation that is required for students to successfully complete their qualification. Ilgan found that academic achievements are closely related to student attitudes [26], while attitude can drive motivation, and motivation can change attitude [27]. Having the right attitude towards student learning may enable these students to apply appropriate time management tools and to seek ways to satisfy their deficiency needs.

Finally, students were asked to select steps that they can take to adopt a more positive view of life and of their academic studies at CUT? The results are shown in Figure 5, where the dominant response relates to focusing on the positive aspects of one's studies (students were again asked to select their top two in order of priority). Optimism can help one to focus on the positive aspects of situations, which could diminish feelings of gloom and dejection, as well as helping to manage problems more effectively [28].

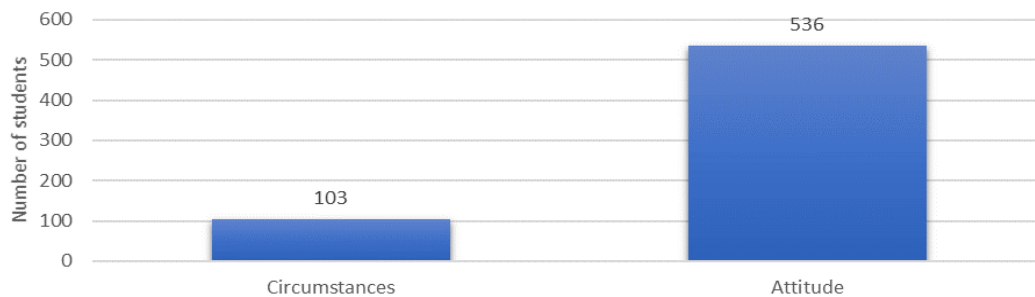


Figure 4: The biggest effect on student success at the university.

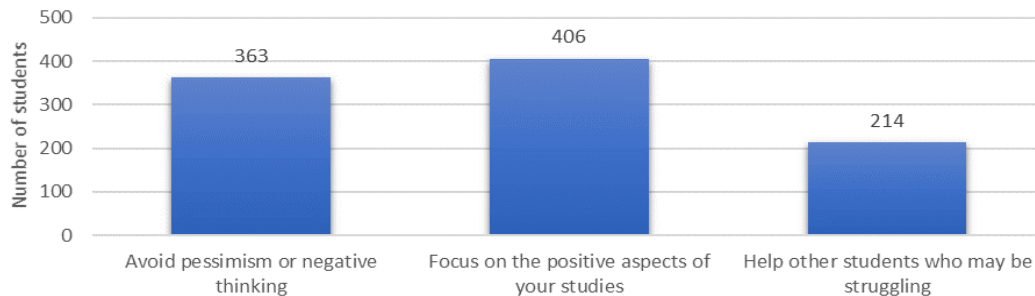


Figure 5: Practical steps to be more positive at the university.

CONCLUSIONS

The purpose of this article is to present freshman engineering student perceptions on what they think is personally required to achieve academic success when considering time management and motivation. A time-lag study was used over a three-year period to gather quantitative data from 626 freshman engineering students using an on-line assessment. The questions to these assessments were drawn from a journal article (relating to motivation and deficiency needs) and a conference paper (relating to time management), which students had to read prior to completing the self-assessment. This formed part of academic student support where the academic responsible for the module shared his previous research relating to motivation and time management.

Student perceptions reveal that not all students are aware of the need to set a study plan at the start of a semester. Academics need to address this concern in class, providing at least two different study plans that may be followed. A concern that academics would struggle to address relates to the physiological needs of the student. Many of these students come from poor backgrounds. Academics should regularly emphasise to their students the importance of an apple or small bowl of porridge in the morning. If the institution has a student feeding programme to help under-privileged students, then academics should make their students aware of where to find this help on campus. What was encouraging is that 83.6% of the students indicated that their academic success would depend, not on their circumstances, but rather on their own attitude, which speaks to motivation.

A drawback of this research is that it was limited to one module in electrical engineering. Broadening this approach to other fields, such as civil or mechanical engineering, may enhance the results. Another limitation relates to the fact that only quantitative questions were asked. However, the aim of the academic student support offered in the electronics module is not to try and understand students' perceptions of time management or motivation. It rather has, as its aim, to help students select appropriate time management tools and become aware of necessary basic needs that they must satisfy in order to improve their chances of academic success.

Obtaining student perceptions regarding which intrapersonal skills are important to possess in higher education may help an academic to get to know his or her students better, thereby helping the academic to provide more appropriate academic student support, if needed. This is perceived as additional assistance and guidance that should be offered to all students above and beyond the disciplinary knowledge of the module. By doing this, the academic may strengthen his or her role within the support system that all students require, so as to enable them to reach their goals in life and not get lost along the way.

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BIOGRAPHY



Arthur James Swart completed his Master's in Education in 2007 and his Doctoral in Electrical Engineering in 2011. He is currently an Associate Professor at the Central University of Technology, Bloemfontein, South Africa, where he mentors staff members regarding the scholarship of teaching and learning. His educational research focuses on the effective use of educational technology to help students fuse their theory and practice. His field discipline research focuses on electronic communication and solar energy. His research collaboration network includes the North-West University, the Cape Peninsula University of Technology, the Vaal University of Technology and the University of South Africa. James has published over 100 conference papers and journal articles within the fields of electrical engineering and engineering education. He has a passion for life-long learning and holds the motto that *consistency is often a mark of quality*.