




# Fostering self-regulated motivation, engagement and student autonomy in an undergraduate natural sciences physiology programme

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**Background.** Self-efficacy, a person's belief in their ability to achieve, strongly influences students' academic motivation, self-regulated learning strategies and academic success. This study explored student self-efficacy in the teaching and learning environment of an undergraduate natural sciences physiology programme at the University of the Free State.

**Objective.** To develop evidence-based guidelines to improve student self-efficacy.

**Methods.** In phase II of an explanatory mixed-methods research design, semi-structured interviews were conducted to collect qualitative data from undergraduate natural sciences physiology students and their lecturers, identified through purposive sampling. The qualitative data were analysed thematically.

**Results.** Three constructs emerged from the thematic analysis: attitudes and approaches, motivational dynamics and teaching practices. Within the construct motivational dynamics, the theme self-regulated motivation comprised the categories (i) motivation to study; (ii) future-orientedness and (iii) student engagement.

**Conclusion.** Based on the findings, a guideline to foster self-motivation, engagement and student autonomy in the teaching and learning environment was developed to enhance student self-efficacy. Future research could evaluate the effectiveness of the guideline following implementation.

**Keywords.** Self-efficacy status, motivation, autonomy, undergraduate students, influencing factors

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Self-efficacy is defined as a person's belief in their ability to succeed, based on the principal assumption that psychological procedures serve as a means of creating and strengthening expectations of personal efficacy.<sup>[1]</sup> This theory-driven assumption postulates a bidirectional relationship between self-efficacy and achievement.<sup>[2]</sup> Social cognitive theory states that human behaviour is extensively motivated and regulated through the ongoing exercise of self-influence.<sup>[3]</sup> It proposes that what people think, believe and feel affects how they behave. These behaviours are influenced by both personal factors and the environment.<sup>[4]</sup> The theoretical framework for this study was informed by self-efficacy theory,<sup>[1]</sup> while Bandura's social cognitive theory<sup>[3]</sup> was used in conjunction with the qualitative findings to guide the development of a guideline aimed at improving student self-efficacy.

The design of the teaching and learning environment and the teaching strategies used to support student engagement have been proposed as self-regulatory processes that influence self-efficacy for learning, thereby contributing to improved student achievement.<sup>[5]</sup> These processes may help address the educational challenge of enhancing student success in South Africa.<sup>[6]</sup> This paper reports on the development of evidence-based guidelines to improve student self-efficacy.

## Methods

In phase II of an explanatory mixed-methods research design, semi-structured interviews were conducted to collect qualitative data from students ( $n=26$ ) and their lecturers ( $n=20$ ) in an undergraduate natural sciences physiology programme, identified through purposive sampling. In phase I of the study, a questionnaire survey was used to collect quantitative data on factors influencing self-efficacy. An experienced interviewer conducted the student interviews, while the researcher conducted the lecturer interviews. The qualitative data generated through the semi-structured interviews were analysed thematically.<sup>[7]</sup>

Students were provided with an information sheet outlining the voluntary nature of participation and the measures taken to ensure confidentiality. Participants were assigned numerical codes to ensure anonymity, and no names or personal identifiers appeared on any data collection sheet or analysis documents. Voluntary completion of the questionnaire implied informed consent. No potential risks associated with participation were anticipated. Ethical approval (ref. no. UFS-HSD2017/0040) for the study was obtained from the Health Sciences Research Ethics Committee of the University of the Free State.

## Results

Thematic analysis revealed three constructs (attitudes and approaches, motivational dynamics and teaching practices), four themes (self-regulated learning, mastery, self-regulated motivation, and teaching and learning environment) and eight categories (practical study skills, critical thinking skills, self-management, motivation to study, future-orientedness, student engagement, degree structure and context, and student autonomy support). This article focuses on the construct of motivational dynamics, which comprised the theme self-regulated motivation and the categories motivation to study, future-orientedness and student engagement. Identification of associated subcategories contributed to the development of a guideline to foster self-motivation, engagement and student autonomy within the teaching and learning environment of the undergraduate natural sciences physiology programme (Table 1).

Findings are presented according to category and supported by direct quotations from participants.

### Category 1: Motivation to study

In this study, motivation to study refers to factors that influence self-regulated motivation. Lecturers reported that students frequently enrolled in programmes to meet degree credit requirements, with their motivation not necessarily stemming from a genuine interest in the programme or subject matter. Consequently, lecturers perceived varying levels of motivation to study among students, which resulted in differences in academic performance, as illustrated by the following quotations:

‘... you have the full spectrum of students who do things differently.’ (Lecturer 1)

‘... students went from real interest to “I just want to get through this class to the next one.”’ (Lecturer 2)

By contrast, students reported intrinsic motivators for studying. One student, for example, reported that personal interest in the subject enhanced understanding and learning:

‘... it is easier to pertain information that is interesting and I have a way of making sense of it and that makes it easier to study ... don’t study that much but mostly study in class.’ (Student 1)

### Category 2: Future-orientedness

Future-orientedness refers to students’ orientation toward and expectations regarding their future career goals, which contribute to self-regulated motivation. Lecturers perceived that some students struggled to envision their future career paths, which appeared to negatively influence their self-regulated motivation. However, lecturers noted that students’ motivation often improved over the course of the semester, as evidenced by the following quotations:

‘... some of them come and say, “I don’t really know how am I going to use my studies”, “where am I going to go with my studies?”, “where am I going to get a job?”’ (Lecturer 4)

‘... final-year students who want to get their degree and I think that is a great motivator.’ (Lecturer 5)

This perception was echoed by students, who described their current degree programme as a ‘stepping stone’ toward achieving their envisioned career goals:

‘... do to study medicine ... I want to use it as stepping stone for other things.’ (Student 2)

### Category 3: Student engagement

Student engagement refers to students’ involvement in the teaching and learning environment. Lecturers reported that physiology practicums enhanced student engagement and interaction. However, although additional practical sessions could further support engagement, implementation was constrained by limited financial resources.

‘... practicums you see them come out more lively and more interactive.’ (Lecturer 6)

‘... used microscopes but we don’t have it anymore. There is no funding for that.’ (Lecturer 7)

Students similarly indicated that practicums motivated them to engage more actively with the subject matter, as reflected in the following statements:

‘... practicums ... you learn how it works and nice to see it and touch it ... it makes you more motivated to study it further.’ (Student 3)

‘... is nice if you can practically apply the things that you study in class.’ (Student 4)

## Discussion

Cognitive, motivational and affective processes play an important role in academic development, as demonstrated by the contribution of perceived self-efficacy to cognitive development.<sup>[8]</sup> Findings from this study indicated a perceived decline in self-regulated motivation, highlighting that teaching strategies should support and enhance student motivation. The guideline developed from these findings aligns with the literature, which indicates that students with high levels of self-regulated motivation tend to have a heightened sense of self-efficacy, are more willing to try new things and are less deterred by challenges.<sup>[9]</sup> The findings also resonate with Ryan and Deci’s<sup>[10]</sup> self-determination theory, which states that intrinsic motivation is autonomously self-regulated, thereby supporting deeper learning and potentially improved academic performance.

Teaching strategies that support student engagement are a key factor in promoting student achievement.<sup>[5]</sup> Based on the findings of this study, the following strategies are recommended:

Guide students to understand the relevance of programme content to their studies and future careers. Applied examples that relate to students’ daily lives, future occupations and the alignment of physiology with other

**Table 1. Summary of the thematic analysis on student self-efficacy.**

Construct	Themes	Categories	Subcategories
Motivational dynamics	Self-regulated motivation	1. Motivation to study 2. Future-orientedness 3. Student engagement	1. Intrinsic and extrinsic issues contributing to the motivation to study influenced self-regulated motivation. 2. Future-orientedness contributed to self-regulated motivation. 3. Strategies aimed at improving student engagement may contribute positively to self-regulated motivation.

programmes may enhance integrated understanding, stimulate interest and support future employment preparedness.

Restructure longer theoretical lectures into shorter didactic presentations followed by student-centred interactive sessions (e.g. a flipped classroom approach) that allow students to apply theoretical concepts. Meaningful, appropriate interaction with students and regular feedback may also enhance lecturers' awareness of students' academic, personal and emotional needs, thereby supporting student autonomy.

Present regular practicums that facilitate the application of theoretical concepts. This may improve student engagement, stimulate interest and strengthen self-regulated motivation.

## Conclusion

This study generated a comprehensive understanding of the interrelated factors influencing student self-efficacy and informed the development of a guideline to foster self-regulated motivation, student engagement and student autonomy within the teaching and learning environment. The guideline provides a practical framework for supporting student self-efficacy and may contribute to improved learning experiences in undergraduate physiology programmes.

**Data availability statement.** None.

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