

Correlation of Academic Performance with Motivation, Learning Strategies and Resources Management Scales among a Batch of Pharmacy Students, National Ribat University, Khartoum, Sudan

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Abstract

Background: Motivation, including intrinsic and extrinsic motivations together with self – efficacy, is an important issue that affects college students’ effort towards excellence and is worth studying. Such studies may offer guidance for coaching under-performing students. However, few studies world-wide are reported concerning the effect of motivation on students’ academic performance. In Sudan, according to the literature survey, no such studies are reported. In this study the academic performance of a batch of pharmacy students in relation to motivation, learning strategies and resources management was assessed.

Methods: This was a cross- sectional, institution facility based study targeted 91 pharmacy students by the end of biochemistry course in semester 5, academic year 2022-2023. Self-administered questionnaire of the 81-item ‘Motivated Strategies for Learning’ was used to collect data. Data were then tabulated and analyzed using Microsoft Excel version 16.0.

Results: Sixty eight completed questionnaire forms were received There was significant correlations of self-efficacy for learning ($r=0.3045$, $p= 0.02$) and metacognitive self-regulation ($r=0.2289$, $p= 0.05$) with academic performance in the biochemistry course. Weak non-significant correlations were obtained with all the rest of items of motivation ($r= -0.1878$ to 0.1878), learning strategies ($r= -0.0109$ to 0.0764) and resources management ($r= -0.1286$ to 0.1103).

Conclusion: According to students’ scores on the components of the questionnaire, some of them showed positive attitude towards learning, however, this attitude did not reflect on their academic outcome. We recommend continuous college students education and evaluation by tutors and social workers on the issues of motivation, learning strategies and resources management.

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Introduction:

Motivation is defined as a force of willingness, desire and obligation to success. ^(1,2) It can be generally classified into two categories, intrinsic and extrinsic motivation. A student with intrinsic motivation is usually interested in following the route of intellectual challenges, whereas one with extrinsic motivation is outcome-oriented, as being motivated to earn a convincing reward or avoidance of punishment. Self-efficacy has also received wide attention. It reflects a student's subjective evaluation of his or her ability to complete a certain task. ^(3,4,5) Student's intrinsic and extrinsic motivation have a positive impact on academic performance. ⁽⁶⁾ Depending on an integrated paradigm based on an input–environment–output, a study conducted among a set of students at the University of Western Ontario revealed a strong relation of academic achievements with motivation but not with intelligence quotient. ^(7,8) An extrinsically motivated behavior results in a lack of adjustment to University, elevated levels of perceived stress and psychological distress, on

the other hand, intrinsically motivated behavior is associated with less stress. ⁽⁹⁾ Another study conducted at the University of Sheffield, England, revealed that neither extrinsic nor intrinsic motivation is related to academic performance. ⁽¹⁰⁾ Motivation evaluation, coaching and following some strategies by the tutors may foster students' expectancy of success. ⁽¹¹⁾

Intrinsically motivated students are usually keen to learn out of peculiarity, interest, enjoyment and desire to achieve personal goals. Extrinsically motivated students are engaged in learning for a reward or avoidance of punishment in case of getting low grades. They put in minimum effort to get maximum reward. ⁽¹²⁾

This study is intended to investigate the relationship between academic performance and levels of motivation, learning strategies and management of resources among pharmacy students in the National Ribat University, Khartoum, Sudan.

Materials and Methods:

Study design and Area:

This is an observational cross-sectional study conducted at the National Ribat University, Sudan. Pharmacy students attending the Biochemistry course in semester 5, academic year 2022 – 2023 were targeted by the study with no exclusion criteria.

Sample Design:

The sample size was calculated as 91 using Solvin's formula,⁽¹³⁾ adjusted by a design effect (Deff) to accommodate resource constraints including time and logistical limitations. $n = N / (1 + \{N * e^2\}) * Deff$

Where

n = sample size, N = total population size (195), e = margin of error (as 0.05),

Deff = 0.7.

Sampling technique followed the simple random sampling method, where questionnaires were handed to randomly selected 91 pharmacy students by the end of biochemistry course in semester 5, academic year 2022 – 2023.

Data collection Methods and techniques:

Data was collected through self-administered interviews using the English–Arabic version of 81-item Motivated Strategies for Learning Questionnaire (MSLQ, 1991 version) instrument.⁽¹⁴⁾ The MSLQ consists of a 31-

item motivation section and a 50-item learning strategies section. The motivation section assesses student's goals, beliefs to succeed and level of anxiety about examinations in a course. The learning strategies section assesses student's use of cognitive and metacognitive strategies (31 items) and management of resources (19 items).

The MSLQ is formed of three main scale components:

1. Motivation scale components involve:

Intrinsic Goal orientation: The perception of reasons for engagement in a learning task. ***Extrinsic goal***

orientation: The degree to which the student's perception to be participating in a learning task for reasons such as grades, rewards, performance, evaluation by others, and competition.

Task value: The evaluation of how interesting, how important, and how useful the learning task is. ***Expectancy***

elements: self-evaluation of learning beliefs and Self-efficacy for learning and performance. ***Affective elements:***

self-evaluation for examination anxiety.

2. Learning strategies scale components

involve: ***Cognitive and metacognitive strategies:*** The student's capability for rehearsal, elaboration, critical thinking

and self-regulation planning with good monitoring.

3. Resource management components involve: **Resource management strategies**: The student's capability for management of time and study environment, effort regulation in the face of distractions and uninteresting tasks and involvement in peer learning and help seeking.

Scoring the MSLQ: Answering questions allocated for evaluation of each MSLQ component, students rate themselves numerically on a seven-point Likert scale from "not at all true of me" to "very true of me."

The student performance was assessed using the final mark obtained in biochemistry course of semester 5.

Statistical analysis:

Descriptive statistics using average score for each MSLQ component to calculate percentages of students above and below average scores was used. In addition, the Pearson correlation coefficient of average scores for each component with the biochemistry final marks was calculated using Microsoft Office Excel 16.0. Correlation scoring a *p-value* of <0.05 was considered significant.

Ethical consideration:

The aim of the study and the MSLQ items were explained and the voluntarily completed questionnaire forms were collected from students who were willing to participate.

Results:

Sixty-eight completed forms were received over a period of 4 weeks giving a response rate of 75%. Scores for components of the three items (motivation, learning strategies and resources management) were tabulated in an excel sheet. Average (mean) score for each component were calculated. Overall, 35.3 to 51.5% of students scored below average for all components. Scores for various motivation components are shown in Table 1. Just over of

half the students were self-motivated by intrinsic goals, such as learning itself (51.5%), whereas others (44.1%) were motivated by extrinsic goals, such as grades or rewards. Less than half (44.1% to 48.5%) of the students rated themselves as below average scores for task value goals such as control of learning beliefs, self-efficacy for learning and test anxiety, respectively.

Table (1): Percentages of Students rated themselves as having below and above the mean score regarding the Motivation scale components

Component	Mean Score	% of Total Students scored below the mean	% of Total Students scored above the mean
Intrinsic goal orientation	5.07	51.5%	49.5%
Extrinsic goal orientation	5.82	44.1%	55.9
Task value	5.49	44.1%	55.9%
Control of learning beliefs	5.89	41.2%	55.8%
Self-efficacy for learning	5.29	47.1%	52.9%
Test anxiety	4.16	48.5%	51.5%

Table 2 shows scores for learning strategies components. For memory recall strategies, 45.6% of students used repetition as a favorable strategy while 44.1% relied on deep thinking and linking ideas. When considering

organization, critical thinking and metacognitive self-regulation the mean scores were below average in 42.6% - 45.6% of students.

Table (2): Percentages of Students rated themselves as below and above the average (mean) score in regard to Learning Strategies Components

Component	Mean Score	% of Total Students scored below the mean	% of Total Students scored above the mean
Rehearsal	5.07	45.6%	54.4%
Elaboration	4.58	44.1%	55.9%
Organization	5.36	47.1%	52.9%
Critical thinking	4.49	42.6%	57.4%
Metacognitive self-regulation	4.70	45.6%	54.4%

Table 3 shows resources management. Around half of the students (48.5%) managed time and space well, while more students (64.7%)

actively collaborated with peers. Another 42.6% rated themselves as below average scores for help seeking.

Table (3): Percentages of Students rated themselves as below and above the average (mean) score in regard to Resource Management Components

Component	Mean Score	% of Total Student scored below the mean	% of Total Student scored above the mean
Time & study environment	4.49	51.5%	48.5%
Effort regulation	3.62	45.6%	54.4%
Peer learning (collaboration)	4.48	35.3%	64.7%
Help seeking	4.72	42.6%	57.4%

Correlations of examination marks with the scores of components are shown in Table 4. Significant positive correlations of marks were found with self-efficacy for learning, as a motivation component, and metacognitive self-

regulation, as a component of learning strategies. The rest of the motivation, learning strategies and resources management components showed non-significant correlations with the students' marks

Table (4): Correlation of Motivation, learning strategies and resource management scales with final marks

Item	Item components	Correlation of mean scores with student final mark (r)	<i>P-value</i>
Motivation	Intrinsic goal orientation	-0.0935	>0.2
	Extrinsic goal orientation	-0.0393	>0.2
	Task value	0.1274	>0.2
	Learning beliefs	0.1030	>0.2
	Self-efficacy for learning	0.3045	*0.02
	Test anxiety	-0.1878	<0.1
Learning strategies	Rehearsal	0.0032	>0.2
	Elaboration	0.0376	>0.2
	Organization strategies	0.0764	>0.2
	Critical thinking	-0.0109	>0.2
	Metacognitive self-regulation	0.2289	*0.05
Resources management	Time and study environment	0.1103	>0.2
	Effort regulation	0.0411	>0.2
	Peer learning	0.0211	>0.2
	Help seeking	-0.1286	>0.2

*Significant correlation

Discussion:

In this study, self-efficacy for learning and metacognitive self-regulation, appeared to be key components that determined students' academic performance. Self-efficacy for learning and metacognitive self-regulation are the basis that measures students' ability to plan, apply strategies, monitor, evaluate and adjust their learning.⁽¹⁵⁾ Motivation of students having no self-efficacy for learning has been expected to be interrupted by conflicted studying activities that arise from competition and differing viewpoints.⁽¹⁶⁾ A study conducted in Saudi Arabia stated that intrinsic and extrinsic motivations significantly correlate with self-efficacy and satisfaction with academic performance; however, they have no effect on the Grade Point Average (GPA).⁽¹⁷⁾ The same study named learning engagement as the only factor that correlates with students' GPA.

In our study, the lack of correlation or even negative correlations of the rest of the components in all motivation items with the performance indicates lack of matching between attitudes, and aptitudes for these students. This may be explained by the fact that most of students' attitudes towards learning are not intrinsic. Moreover, these students lack inherent ability to acquire knowledge and skills through cognitive processes like memory, attention and information processing.

The social life in Sudan together with students' daily life difficulties of transportation and

financial constraints together with some emotional problems are likely to be the main factors to cause classroom distractions and interruption of studying plans. Moreover, self-efficacy is usually affected by the willingness to be enrolled in a preferred field of learning. Surprisingly, in a study among Sudanese students, the effect of society-related factors were found to have no effect on enrollment to specific field of study.⁽¹⁸⁾ Generally, students who record good marks are confident that they can do well. Moreover, they put a plan for studying and understanding the course material, and they follow their plan strictly. This requires personality factors that help students to isolate studying from distractions.⁽¹⁹⁾ Failure to recognize potential stressors and to prevent them or, at least avoid their impacts may affect student self-regulation and performance.⁽²⁰⁾ In a study conducted in China comparing learning motivation among first-generation and second-generation college students, concluded that learning motivation and environmental support interact to promote the student's academic success.⁽²¹⁾

Conclusion:

According to students' scores on the components of the questionnaire, some of them show positive attitude towards learning, however, this attitude did not reflect on their academic performance. Factors like psychological readiness and aptitudes that

match one's attitudes are better predictors of grades than cognitive ability. To improve these personality factors, students need support from their tutors and social workers as well as parents. We recommend conducting such study on newly admitted batch of students

considering all possible factors that may be affecting students' motivation to learn as well as to follow and see the effect of interventions on their academic performance all through study years.

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