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Developing an Instrument for Measuring Student Motivation among High Schools in Educational Jordan Context

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Abstract

This study aims to enhance the literature by validating every item and making it reliable of student motivation (SM) construct through the Exploratory Factor Analysis (EFA). Toward Jordan's educational sector, measuring instrument from the literature was adapted by the researcher for the sake of latent construct, and the items were modified to suit the study. To establish (SM) construct reliable instrument, a cross-sectional research design was employed in the study. IBM-SPSS Version 21.0 was used to analyze the data, and a structured questionnaire from 100 students was utilized. It was subsequently revealed by the research outcome that the construct achieved validity and reliability tests and each item was maintained as it suits (SM) construct measurement. Thus, a suitable, reliable, and validated instrument has been established for (SM) construct measurement among high public schools in the Jordan educational sector. Therefore, the current research's findings provide a reliable source of information to further researchers, teachers, administries, academicians, and decision-makers of student Motivation in the Jordan Context

Keywords: Student Motivation, Students' Characteristics, Students' Academic Performance, Exploratory Factor Analysis.

Introduction

It is important to value performance evaluation while providing information and feedback to teachers and students in making decisions. Academic performance could be measured by policymakers through students' behavior and traits. Through identification, students could achieve great and excellent performance in their academic (Mat et al., 2019). As such, many academic institutions focus more on investing in enhancing students' performance.

Asif et al (2017) argued that can be possible to predict students' performance with accuracy. According to Amazona and Hernandez (2019), a student's academic performance represents a student's understanding about a course. Darkwa and Antwi (2021) contended that knowledge acquisition, skill development, student's grade, course, or program completion constitute a student's performance.

Hence, it is the aim of the researcher to develop a model that guarantees successful and fruitful outcomes of the educational process. It is within the target of the researcher to

develop and design a framework that encompasses students' academic performance, student characteristics and students' motivation in the Jordanian government schools. As such, toward attaining the research purpose, Exploratory Factor Analysis shall be applied to obtain the validity and reliability of evaluating the questionnaire SM items.

Objective of this Study

The study aims at developing a measuring instrument for the motivation of students construct in the educational context of Jordanian government high schools.

Literature Review

This section consists of a literature review on relevant variables for further discussion and thus develops the research hypotheses.

Hypothesis Development and Research Framework

Motivation and Student Academic Performance

According to Chepkirui and Huang (2021), motivation means an individual's incentive towards a specific task. Motivation is a salient instrument that determines academic success. It encourages students and people at large to remain committed and interested in their respective subject, job, role, and position, thus crown their efforts with the achievement of goals (Gbollie and Keanu, 2017). In the current study, motivation refers to a student's desire towards improving his performance. As a matter of reality, many researchers submitted that motivation is vital and significant in getting good academic performance for students (Claver et al. 2020; Sarkis et al., 2020; Winter, 2018).

Students' Characteristics and Student Academic Performance

Personal Characteristics are described as personal qualities, features and traits possessed by someone, which in turn, produce high potential results and effective work performance (Aye, 2018; Neneh, 2011). In this study, risk-taking, perseverance, assertiveness, independence, work-capacity, self-esteem, self-confidence, flexibility, versatility, persuasion, determination, imagination, emotional stability, motivation, tolerance, and experience-knowledge represent students' characteristics (Santos and Harrison, 2015). The available literature showed that the relationship between student's academic performance and students' characteristics is robust and rigid (Cárdenas Moren et al., 2020; Carvalho and Abreu, 2018; Chepkirui and Huang, 2021).

Research Questions

The following research questions and objectives were generated from the afore-listed objectives and review of literature:

RQ1: Does motivation significantly influence students' academic performance?

RQ2: Do Students' characteristics influence students' academic performance?

The Research Framework

The review of literature produces the development of a conceptual framework, and the connections between the proposed variables were explored through a model. The framework has three constructs. The independent constructs comprise student motivation and Students' characteristics. students' academic performance the dependent construct. The framework,

as stated in Figure 1 investigated the connection between these variables. The study hypotheses include

H1: Student motivation has a positive and significant effect on the students' academic performance.

H2: Students' characteristics have a positive and significant effect on students' academic performance.

Figure 1. The Research Framework of the Study

Methodology

As opined by Dehisat and Awang (2020); Shkeer and Awang (2019) pilot-test and pre-test are imperative to be controlled to verify the changed instruments, if the original tool was vigorously progressed in a community of several nations and cultures from the current research. Thus, the investigator finds the measuring tool suitable for the construction of SM from the past literature and amended the items to be of standard with the present study. Once the preparation of the primary questionnaire is decided, the content validity and face validity of the questionnaire is read subsequently by a panel of capable knowledgeable persons to be certain that the measures are appropriate to the planned goal and comprehensible. In this context, applicable remarks for part of the questions are reduced and rephrased by extraordinarily skilled people. In addition, there was an initial conversion process of the questionnaire conscripted from English to Arabic translation (Brislin, 1980) the translation was properly reassessed by the teams of experts, making the required adjustment for the definite context (Brislin, 1980). After minor modifications based on their feedback, the Arabic version was finalized. The questionnaire was then back-translated into English to ensure conceptual equivalence (Chang et al., 1999). Another expert who was a statistician decided the authenticity of the criterion and verified that the balance used to quantify data are relevant for the statistical analysis (Notelaers et al., 2019).

For instance, in Karak city, South Jordan, a preliminary test using five different high school students samples was used. To avoid being biased, the questionnaire was amended to stop main tools (Woodside, 2013). Aside from that, design was used to structure appropriate measures to motivate high school students in the Jordanian context.

The current study is approached quantitatively, and literature is reviewed to measure the concept of SM. Most of the objects used were found appropriate and some were amended accordingly for the sake of the study. In the public schools at Karak city, a population of 100 students were randomly selected on-campus, and empty questionnaires were distributed to them.

The Exploratory Factor Analysis (EFA) procedure using IBM-SPSS version 21.0 was carried out. The target population consists of students of high public schools in the Jordan educational sector specifically in Karak schools. the study employed simple random sampling to obtain a representative sample from each school. Self-administered questionnaires were handed over to respondents to respond at a suitable and advantageous time.

Research Tool

To measure students' motivation, a structured questionnaire was proposed for data collection with 10 items on a 10-point interval scale ranging from 1 = strongly disagree to 10 = strongly agree. A ten-item questionnaire was used to measure SM construct in this study which was drawn from the study of (Martin, 2003; Nauzeer and Jaunky, 2019).

The basis to acquire the suitable measurement of SM among Jordanian education context. Table 1 shows the adapted items in each of the SM dimensions. One of the sample items include "I believe I can do my schoolwork well". "I believe learning at school is important". "I feel very pleased for understanding what I'm taught at school". "I plan well before I start an assignment". "I usually study in places where I can concentrate". I keep going overstudy until I understand my schoolwork". They were extracted from (Martin, 2003).

"I'm always energetic". "I think our educators are good". "I believe that I'm not wasting my time at school". "I try to find out when and why I make a mistake". They were composed by (Nauzeer and Jaunky, 2019).

Table 1: Items of the three dimensions of SM construct

statement	Source
I believe I can do my schoolwork well	Martin, 2003
I believe Learning at school is important	Martin, 2003
I feel very pleased for understanding what I'm taught at school	Martin, 2003
I plan well Before I start an assignment	Martin, 2003
I usually study in places where I can concentrate	Martin, 2003)
I keep going overstudy until I understand my schoolwork	Martin, 2003
I am always energetic	Nauzeer and Jaunky, 2019
I think our educators are good	Nauzeer and Jaunky, 2019
I believe that I am not wasting my time at school	Nauzeer and Jaunky, 2019
I try to find out why When I make a mistake	Nauzeer and Jaunky, 2019

Exploratory Factor Analysis (EFA) and Reliability Analysis

Since this research entails a new concept which exists from the adjustment of previous studies, the set of survey questions must pass through the EFA test in a way to be adapted with the current research model from 100 students, which were materialized to the method of Principal Component Analysis (PCA) and Varimax rotation (Dehisat and Awang, 2020a). The PCA usage is proposed in the determination of preliminary solutions in EFA (Pett et al., 2003). The choice of Varimax was over the oblimin since the factors were autonomous of one another.

To conduct the suitability of the data for running factor analysis, the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) and Bartlett's Test of Sphericity (BTOS) were checked. A KMO value of 0.60 and above (Baistaman et al., 2020; Kaiser, 1974), and a statistically significant Bartlett's Test of Sphericity with P-Value < 0.05 (Alias et al., 2019) were used as indicators of data factorability.

This research chooses to retain objects with factor loadings higher than 0.60 from a pool of created objects (Awang, 2015), and the number of objects per factor certainly must be at least three of the factor to be kept in possession (Hair et al., 2010).

Finally, a construct must also be reliable, in this regard, the dependability of the student motivation construct was calculated using the internal consistency dependability. This internal reliability shows how capable the respective objects are binding to one another in the measurement of the same concept. Hence, this research is of necessity to estimate the value of Cronbach's Alpha in a way to determine the internal reliability of the kept objects. Asnawi et al. (2019); Ehido et al. (2020) recommended that an acceptable level of The Alpha Cronbach for each construct is at least 0.70.

Results and Discussion

This construct was measured using 10 items, and each item was measured using a Likert scale of 10. The mean response, standard deviation, and item statement, for each item, are listed in Table 2.

Table 2: The mean and standard deviation for every item measuring SM

	Item Statement	Mean	Std. Deviation
Q1	I believe I can do my schoolwork well	7.50	1.322
Q2	I believe Learning at school is important	8.50	1.168
Q3	I feel very pleased for understanding what I'm taught at school	7.37	1.220
Q4	I plan well Before I start an assignment	8.42	1.241
Q5	I usually study in places where I can concentrate	7.61	1.294
Q6	I keep going overstudy until I understand my schoolwork	7.38	1.285
Q7	I am always energetic	6.28	1.349
Q8	I think our Educators are good	7.35	1.424
Q9	I believe that I am not wasting my time at school	7.29	1.289
Q10	I try to find out why When I make a mistake	8.39	1.399

Table 3 indicates the results of Bartlett's Test of Sphericity and Kaiser-Meyer-Olkin (KMO). Bartlett's Test of Sphericity result from student motivation construct is significant with P-Value <0.05 , while Kaiser-Meyer-Olkin (KMO) results show that all items exceeded the required value which is more than 0.6. With 0.882, the results indicate that the data is adequate

Table 3: The Value for KMO Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.882
Bartlett's Test of Sphericity	Approx. Chi-Square	954.843
	Df	45
	Sig.	.000

All items in this construct belonged to two components. The scree plot in Figure 2 shows that two-component have emerged from the EFA.

Figure 1: The Scree Plot clearly show two components that emerged

The results in Table 4 shows there are two components that emerged from the EFA procedure based on the computed Eigenvalue >1.0 . The total variance explained for measuring this construct is 82.648. The total variance explained is acceptable since it exceeds the minimum of 60% (Noor et al., 2015).

Table 4: Total Variance Explained contributed by every component of SM

Total Variance Explained						
Component	Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.665	46.653	46.653	4.330	43.295	43.295
2	3.600	35.995	82.648	3.935	39.353	82.648
Extraction Method: Principal Component Analysis.						

As shown in Table 5 for each item, the results indicate the factor loading for every item >0.6 Thus all items will be retained as indicted by (Yahaya et al., 2018).

Table 5: The Factor Loading for every item and their component

Rotated Component Matrix		
	Component	
	1	2
Q1		.890
Q2		.885
Q3		.860
Q4		.883
Q5		.905
Q6	.911	
Q7	.939	
Q8	.936	
Q9	.932	
Q10	.924	
Extraction Method: Principal Component Analysis.		
Rotation Method: Varimax with Kaiser Normalization.		
a. Rotation converged in 3 iterations.		

Finally, Table 6 illustrates that values of Cronbach's Alpha are 0.931, 0.961, and 0.871. This value indicates how strong the respective items are holding to each other in measuring the same construct.

Table 6: The Internal Reliability value for each component

Reliability Statistics		
Component	No of Items	Cronbach Alpha
1	5	0.931
2	5	0.961
All items	10	0.871

Discussion

The results show that each component exceeded the limit of the threshold, therefore, the items in this questionnaire can be used to measure the construct of this study. Thus, items can be adopted and used for future research.

Conclusion

Exploratory Factor Analysis (EFA) displays that the SM construct in the concept was detected by the use of two components. This study succeeded in gathering items from the research construct and formed an instrument to measure SM. According to high Cronbach's Alpha value, Bartlett Test achievements (significant), KMO (> 0.6), and exceed 0.60 of factor loadings were concluded through this instrument which passed the authenticity and dependability trials of all objects, and are suitable for usage in the later review. On the basis of the research findings, the investigator proposes that future researchers should use this tool in future research specifically in the educational sector in Jordan. to understand the critical role of student motivation in boosting student academic performance among their schools.

Theoretical and Practical Contribution

Theoretically, the study findings contribute to enhancing future studies by confirming the items that contribute to student motivation construct. The major significance of the current study is to explore the items that ensure and guarantee student motivation in Jordanian educational schools. Practically, the findings of the study help in highlighting conditions and procedures that contribute to the improvement of student's performance. The study increases the need for creating awareness about the role of student's motivation toward enhancing student's academic performance.

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