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RELATIONSHIP BETWEEN COGNITIVE COMPETENCE (KNOWLEDGE) AND ACADEMIC MOTIVATION AMONG UNDERGRADUATE STUDENTS: EXAMINING INTRINSIC MOTIVATION, EXTRINSIC MOTIVATION, AND AMOTIVATION IN HIGHER EDUCATION

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KEYWORDS	ABSTRACT
Global competence, cognitive competence, academic motivation, knowledge, undergraduate students	Global competence has grown in significance as a part of the curriculum in higher education because students should develop knowledge, skills and attitudes that promote effective learning and participation in a rapidly changing world. In this general competency framework, cognitive competence is viewed as knowledge and understanding that underlie students' learning and academic participation. This research focused on the correlation between cognitive competence and the academic motivation of undergraduate students. A quantitative correlational design was used. The data were collected from 1200 undergraduate students studying in Education departments of three universities in Lahore. Cognitive competence was measured using the knowledge and understanding dimension of the Global Competence Scale adapted from Liu et al. (2020) and the Academic Motivation Scale (AMS) was used to measure academic motivation. Using Pearson product-moment correlation, the relationships between knowledge and intrinsic motivation, between knowledge and extrinsic motivation and between knowledge and amotivation were explored. The results indicated that there were meaningful positive correlations between intrinsic motivation and knowledge ($r = .35, p < .001$); and there was a meaningful positive correlation between extrinsic motivation and knowledge ($r = .26, p < .001$). There was also a significant but very weak negative relationship between knowledge and amotivation ($r = -.099, p = .001$). In general, the results showed that knowledge and understanding is dimension of cognitive competence and is significantly correlated with intrinsic motivation, extrinsic motivation and amotivation among undergraduates.
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Introduction

The term “global competence” has emerged as a central focus in higher education, defining the knowledge, skills, and attitudes that students should develop to address the changing nature of educational and social issues in the world (UNESCO, 2023). Global competence has multiple dimensions with respect to knowledge and understanding, skills, attitudes and values of students. In the present study, the Knowledge and Understanding dimension is used as an indicator of cognitive competence and is referred to as Knowledge in the article. Knowledge is the base of learning as pupils should learn and make use of knowledge to fulfil learning tasks. Academic motivation is also a major component of learning, which encompasses intrinsic, extrinsic, and amotivation (Cerasoli et al., 2014; Guay, 2022).

A recent study has shown that there is a relationship between the cognition, motivation and participation of students in learning (Li et al., 2023). Studies in higher education have studied cognitive competence and academic motivation, but there have been few studies that examined the relationship between knowledge as a dimension of cognitive competence and academic motivation. There is also limited evidence on the context of undergraduate students in developing countries, especially Pakistan. Hence, the present study explored the relationship between knowledge and academic motivation, specifically intrinsic motivation, extrinsic motivation and amotivation among undergraduate students.

Statement of the Problem

At the higher education level, academic motivation and cognitive competence are important aspects of students' learning. Knowledge is linked to students' academic activities and academic motivation is linked to interest in and involvement in learning. Earlier researches have focused on the study of cognitive competence and academic motivation; however, few studies have focused on the connection between knowledge as a component of cognitive competence and academic motivation. This is especially important among undergraduate students in Pakistan, where the relationship has not been well documented. Hence, the present study aimed to investigate the relationship between knowledge as one component of cognitive competence and academic motivation (intrinsic, extrinsic and amotivation) among undergraduate students.

Research Objective:

The objectives of the present research are to:

1. Analyze the connection between cognitive competence and academic motivation among Higher Education students.
2. Examine the relationship between cognitive competence (knowledge) and academic motivation “intrinsic motivation” amongst undergraduate students.
3. Examine the relationship between cognitive competence (knowledge) and academic motivation “extrinsic motivation” of undergraduate students.

4. Examine the relationship between cognitive competence (knowledge) and academic motivation “amotivation” among undergraduate students.

Research Hypothesis

This research has the following hypotheses:

1. The relationship between cognitive competence (knowledge) and academic motivation “intrinsic motivation” of undergraduate students is not significant.
2. The relationship between cognitive competence (knowledge) and academic motivation “extrinsic motivation” of undergraduate students is not significant.
3. The relationship between cognitive competence (knowledge) and academic motivation “amotivation” of undergraduate students is not significant.

Theoretical Framework

The study was based on the 21st Century Competency Framework and the Self-Determination Theory (SDT). The 21st Century Competency Framework focuses on the knowledge, skills and attitudes that are vital for successful learning and social participation in the 21st century (OECD, 2023). In this study, the Knowledge and Understanding dimension was used as an indicator of cognitive competence and was referred to as Knowledge in the text. The concepts of academic motivation intrinsic motivation, extrinsic motivation, and amotivation are based on Self-Determination Theory (Ryan & Deci, 2020). Both of these theoretical perspectives were used to investigate the relationship between knowledge as cognitive competence and three academic motivation types among undergraduate students.

Methodology of Research

This section explains the research design, sample and sampling technique, research instruments, ethical considerations, and data analysis in the study.

Research Design

This study explored the relationship between cognitive competence (knowledge dimension) and academic motivation for undergraduate students. A quantitative correlational research design was used. A structured questionnaire was used to collect data. The competency items were adapted from the Global Competence Scale for Graduate Students (GCSG) created by Liu et al. (2020), and the items related to academic motivation were designed based on the Academic Motivation Scale (AMS) created by Vallerand et al. (1992). In this article, the knowledge dimension was analyzed as a representative indicator for cognitive competence, and intrinsic motivation, extrinsic motivation, and amotivation were assessed.

Sample and Sampling Technique

The study was carried out on the students of the Education department of three universities recognized by HEC in Lahore. The two public universities and one private university were purposively selected, and students who were available and willing were selected through convenience sampling. 1250 questionnaires were sent out. Returned questionnaires were screened, after which a total of 1,200 questionnaires were valid for the final analysis, excluding questionnaires that were incomplete or incorrectly completed.

Ethical Considerations

The study was conducted on a voluntary basis. The participants were briefed about the objective of the study, and their information would be confidential and used only for research. In addition, participants were told they could opt out and drop out of this study. The questionnaires were taken with their consent.

Research Instrument

The questionnaire consisted of Demographic Items, Competency Items, and Academic Motivation Items. The competency items were based on the Global Competence Scale, which was created by Liu et al. (2020). The scale includes knowledge and understanding, skills and attitudes, and values. In the current research, the knowledge and understanding dimension was indicated as cognitive competence and named as knowledge in this article. The competency items were measured using a five-point Likert scale.

The Academic Motivation Scale (AMS) of Vallerand et al. (1992) was used to assess academic motivation. The three components of the AMS are intrinsic motivation, extrinsic motivation, and amotivation. The items were adapted for the context of undergraduate students. Both instruments were examined for their appropriateness for the study setting, and content and face validity were pretested before data collection.

Reliability of the instrument

The instrument was found to be reliable. To test the reliability of the study variables, Cronbach's alpha was used based on the answers given by 1200 undergraduate students. The 10-item Knowledge scale showed a Cronbach's alpha of .760. The 4-item Intrinsic Motivation scale had an alpha of .678, the 12-item Extrinsic Motivation scale showed an alpha of .841, and the 4-item Amotivation scale had an alpha of .781. Everything was kept for the final analysis.

Data Analysis

Data obtained were analysed descriptively and inferentially. Pearson product-moment correlation was used to explore the relationship between knowledge and intrinsic motivation, extrinsic motivation, and amotivation. A p-value of $< .05$ was used for statistical significance. This

study was correlational in nature and therefore results were presented in terms of the relationship between the variables.

Analysis and Interpretation Of Data

Table 1. Analysis of Descriptive Statistics Relating to Cognitive Competence(knowledge) in University Students at Undergraduate Level.

Independent variables	N	Mean	SD
1. I know the history and geography of at least one country other than my own country.	1200	3.75	1.11
2. I know about the language, cultural expectations, religion, beliefs and customs of other countries besides my own country.	1200	3.87	1.07
3. I am aware of the concept of globalization and the trends of globalization.	1200	3.70	1.02
4. I am aware of the impact of globalization on the development of a country, on individual life, and on scientific research in a nation.	1200	3.73	0.96
5. I understand the roles of international organizations and institutions in today's world and society.	1200	3.76	1.00
6. I listen to news about what is going on all over the world and in foreign countries.	1200	3.41	1.10
7. I know about the well-known theories/schools of thought in my field of study/profession.	1200	3.81	0.96
8. I know the main accepted research practices in my field of research or profession internationally.	1200	3.44	1.07
9. I can easily read and write in one foreign language.	1200	3.87	1.13
10. I can easily use MS Office, PDF Reader, and other common international software.	1200	3.87	1.13

Table 2. Academic Motivation Analysis of Descriptive Statistics of Undergraduate Students.

Variables	N	Mean	Standard deviation
1. If I discover something new that I never saw before, for the pleasure that I obtain.	1200	4.10	0.94
2. To enjoy the knowledge of subjects that interest me.	1200	3.85	0.95
3. I find enjoyment in learning new things.	1200	3.95	0.98
4. I can learn about a lot of things that interest me because of my studies.	1200	3.92	1.04
5. I believe that education will be a key part of my preparation in the career I selected because I think that will	1200	4.31	1.58

be a key part of me getting better prepared.			
6. This will aid me to making a better choice of career orientation.	1200	3.96	0.96
7. I think that my education will increase my ability to be a worker.	1200	3.90	1.14
8. To find out that I can finish my diploma.	1200	4.16	1.47
9. Because when I succeed in school, I feel important.	1200	3.93	0.92
10. To show myself that I am an intelligent person.	1200	3.78	1.05
11. I would like to demonstrate to myself that I am capable of achieving good grades in my studies.	1200	3.91	1.07
12. Because I need at least a high school diploma to find a high-paying job later on.	1200	3.87	1.11
13. To obtain a more respected job later on.	1200	3.72	1.03
14. Because I want to lead a "decent life" someday.	1200	4.01	1.06
15. Well, honestly, I don't know; I'm just feeling like I'm wasting my time at school.	1200	2.80	1.44
16. I had multiple good reasons to attend university, but now I'm not sure if I should stay.	1200	2.65	1.22
17. I can't see why I go to university, and frankly, I couldn't care less.	1200	2.95	1.30
18. I don't know; I can't understand what I'm doing in school.	1200	3.07	1.39

Figure 1: Mean Scores of Cognitive Competence(knowledge)

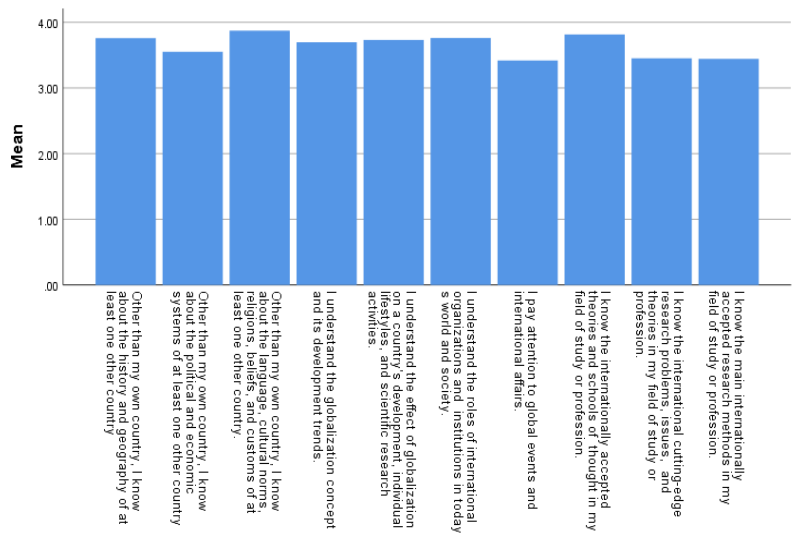
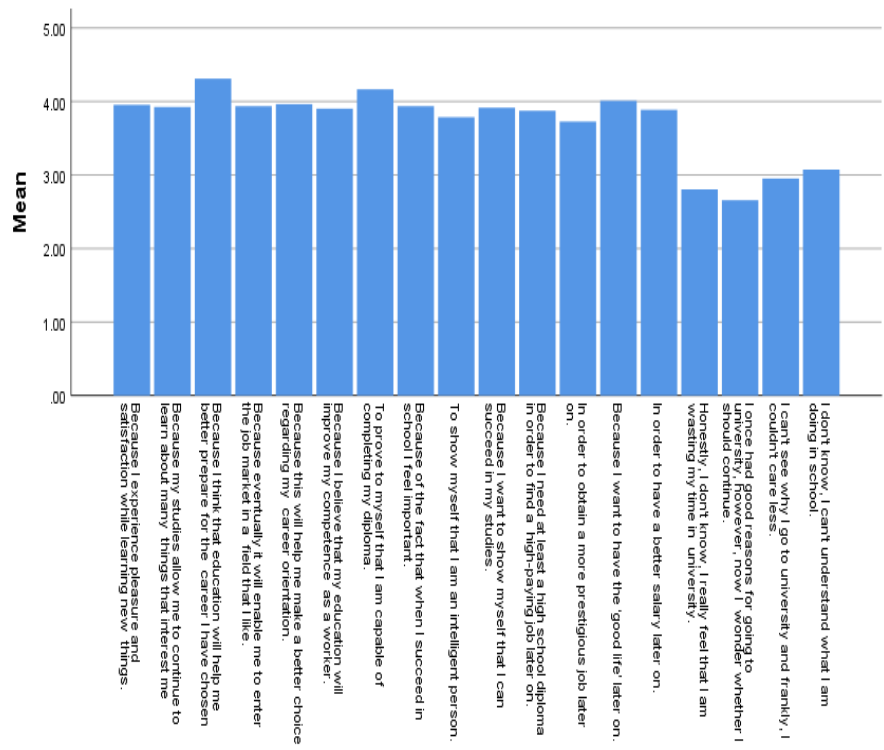


Figure 2: Mean Scores of Academic Motivation



Descriptive Statistics of the Study Variables

The descriptive statistics of the study variables are presented in the table. Knowledge, intrinsic motivation, and extrinsic motivation had relatively higher mean scores, whereas amotivation had a comparatively lower mean score.

Variable	N	M	SD
Knowledge	1200	3.65	0.59
Intrinsic motivation	1200	3.96	0.70
Extrinsic motivation	1200	3.94	0.63
Amotivation	1200	2.87	1.05

Pearson correlation was used for analyzing the correlation between cognitive competence(knowledge) and intrinsic motivation of undergraduates.

Research objective 1

To examine the relationship between cognitive competence(knowledge) and academic motivation “intrinsic motivation” amongst undergraduate students.

Research hypothesis 1.1

The relationship between cognitive competence (knowledge) and academic motivation “intrinsic motivation” of undergraduate students is not significant.

Table 3: *The Relationship between Knowledge and Academic Motivation “Intrinsic” of Undergraduate Students*

Variables	N	R	P
Knowledge and Intrinsic Motivation	1200	0.35	$p < .001$

Correlation analysis was then performed to determine the relationship between knowledge and intrinsic motivation by undergraduate students, as presented in Table 3. Results indicated that knowledge had a positive correlation with intrinsic motivation ($r = .35$, $p < .001$). Thus, it was concluded that there was a significant relationship between knowledge and intrinsic motivation of the undergraduate students and the null hypothesis was rejected.

Research objective 2

To examine the relationship between cognitive competence(knowledge) and academic motivation “extrinsic motivation” of undergraduate students.

Research hypothesis 2.1

The relationship between cognitive competence (knowledge) and academic motivation “extrinsic motivation” of undergraduate students is not significant.

Table 4: *Academic motivation “extrinsic motivation” in Undergraduate students and its relation with cognitive competence(knowledge)*

Variables	N	R	P
Knowledge and Extrinsic Motivation	1200	0.26	$p < .001$

The results of the correlation analysis showed that there was a positive correlation between knowledge and extrinsic motivation among the undergraduate students ($r = .26$, $p < .001$). Thus, the null hypothesis was rejected indicating that there was a significant relationship between knowledge and extrinsic motivation

Research objective 3

To examine the relationship between cognitive competence(knowledge) and academic motivation “amotivation” of undergraduate students.

Research hypothesis 3.1

The relationship between cognitive competence (knowledge) and academic motivation “amotivation” of undergraduate students is not significant.

Table 5: *Correlation Between Cognitive Competence (Knowledge) and Academic Motivation “Amotivation” of Undergraduates*

Variables	N	R	P
Knowledge and Amotivation	1200	-.0099	p = .001

Results at the undergraduate level revealed that knowledge and amotivation had a significant yet weak negative correlation ($r = -.099$, $p = .001$), as seen in Table 5. This indicates a slight negative association between knowledge and amotivation. So, it was concluded that the null hypothesis was rejected because the relationship between knowledge and amotivation was statistically significant.

Discussion

The findings revealed that there was a significant positive correlation between knowledge and intrinsic motivation of undergraduate students ($r = .35$, $p < .001$). This suggests that there was a positive association between knowledge level and intrinsic motivation. This finding indicates a positive association between knowledge and intrinsic motivation among undergraduate students. This is in line with the Self-Determination Theory (Deci & Ryan, 2000; Ryan & Deci, 2017), which lists competence as one of the psychological needs that form the basis of motivation and engagement. In addition, research based on SDT in education also mentions the importance of psychological needs in the students' intrinsic and extrinsic motivation (Guay, 2022).

Knowledge was also significantly and positively related to extrinsic motivation ($r = .26$, $p < .001$). This finding indicates that knowledge was positively correlated with students' level of extrinsic motivation. Academic knowledge can have an association with students' work towards external academic and future-oriented goals, including academic performance, career development and employment. Self-Determination Theory recognizes that different forms of motivation are related to the reasons underlying students' engagement in academic activities (Deci & Ryan, 2000; Guay, 2022). The present study, however, employed a correlational design, thus, the results suggest an association, not necessarily a causal relationship.

The correlation between knowledge and amotivation was not high, and was negative ($r = -.099$, $p = .001$). There was a small negative relationship between knowledge and amotivation. This finding should be interpreted with consideration for the size of the correlation. According to Self-Determination Theory, amotivation is when someone doesn't have the intention or motivation to do something (Deci & Ryan, 2000; Ryan & Deci, 2017). The current result shows that knowledge is negatively associated with amotivation, although the association is weak, in undergraduate students.

In summary, the findings indicate that knowledge was significantly related to intrinsic and extrinsic motivation, and amotivation, as the cognitive component studied in this research. Intrinsic and extrinsic relationships were positive, and amotivation was negative. These results are analyzed and discussed in relation to academic motivation and cognitive competence in the 21st Century Competency Framework and Self-Determination Theory.

Conclusion and Future Proposals

The general aim of this study was to explore the correlation between cognitive competence and academic motivation of undergraduate students. This project will conclude with a summary and a few recommendations for future research.

The study examined the correlation between cognitive competence (knowledge dimension) and academic motivation of the undergraduate students. The results showed that there was a significant positive correlation between knowledge and intrinsic motivation ($r = .35$, $p < .001$) and knowledge and extrinsic motivation ($r = .26$, $p < .001$). Additionally, there was a relatively small, but significant, negative relationship between knowledge and amotivation ($r = -.099$, $p = .001$). As a whole, the results show that knowledge was significantly related to intrinsic motivation, extrinsic motivation, and amotivation of undergraduate students.

The results indicate that HEIs can be the location that offers learning environments which are conducive to the development of knowledge and the engagement of students in the learning process. Teachers are free to emphasize conceptual understanding, opportunities for the application of knowledge, and meaningful learning experiences that promote student involvement in academic activities. The relationship between knowledge and amotivation was also very low so it cannot be taken as a ground to make strong institutional claims.

Further studies might explore the connection between cognitive competence and academic motivation in other contexts of higher education and in various academic fields. Other factors that may relate to students' motivational status can also be considered in additional studies, including teaching-learning strategies, classroom environments and students' learning experiences. Additional knowledge of the relationship between cognitive competence and academic motivation through time can be gained from research designs such as longitudinal.

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