The Impact of Student Aptitude on Academic Success in International Higher Education

Fahad Qayyum

Country Manager, Pakistan - Queen's University, Belfast

*Email: fahad.fq87@gmail.com

Abstract: International students have diverse backgrounds and experience that can impact their academic success in international education. Purpose of this research intends to provide empirical evidence of the impact of student aptitude on the academic success in the context of higher education in UK. Data is gathered from 748 international students studying at UK universities, and analyzed using regression analysis. The results revealed a significant positive association amid student aptitude and academic success among international students. The regression coefficient (β=0.65) and R^2 (0.40) of the model designated students' aptitude to be a strong antecedent of academic success. The results are supported by the Cognitive Load Theory which suggests that students having higher cognitive abilities could manage cognitive load in a better manner, which facilitate effective learning and higher academic success. The findings imply that aptitude and cognitive abilities of students are critical contributing factors towards academic performance and inspires additional assessment of cognitive and non-cognitive elements in this regard. The findings are of significance to practitioners and educators in designing more effective student support systems and educational strategies for international higher education.

Key words: Student Aptitude, Academic Success, International Higher Education, United Kingdom, Student Support

1. Introduction

The world is becoming more of a global village. Higher education institutions (HEIs) across the globe are receiving numerous enrollments of international students. International student brings along diverse backgrounds and experience that can hugely impact their academic success in international education. Aptitude of students is an important factor that influence academic performance, particularly when it comes to international education. Student aptitude is often assessed using standardized test scores, academic achievements of the students, and their cognitive abilities. It is a significant predictor of a student's ability to perform well academically in a foreign environment. Academic success is a multi-dimensional construct that beside academic grades and GPA, also include students' overall ability to achieve educational goals, persistence with challenges, and secure graduation (York, Gibson & Rankin, 2019). Whereas, typically measured through GPA, grades, and completion rates, however, Academic success also includes student ability to engage in learning process and counter academic challenges (Chemers, Hu, & Garcia, 2001; Khan, 2023). Student aptitude represents student inherent learning abilities, including problem-solving skills, cognitive abilities, knowledge and capacity of critical thinking required for academic success (Laidra, Pullmann, & Allik, 2007). The association amid students' academic success and aptitude is recognized well in the scholarly research, with aptitude being a significant predictor of academic success. Recent research has demonstrated that students with higher aptitude levels are inclined to better perform academically, impacting GPAs, course completion rates, and persistence in the academic pursuits (Lynam, Cachia

& Stock, 2024; Richardson, Abraham, & Bond, 2012; Schneider & Preckel, 2017). Studying student aptitude is predominantly imperative in the international higher education, since students generally counter with additional challenges, like cultural differences, language barriers, and differences in educational systems. International students are required to acclimate to a novel academic atmosphere that might be immensely unlike to what they are already accustomed. This process of immense adaptation can be influenced by the students' aptitude, which in turn affects their academic success (Crawford & Wang, 2016; Mulyadi et al., 2024). Understanding the relationship amid student aptitude and academic success in the international higher education is of significant importance to academicians, policymakers, and institutions since this can help in designing better student support systems, resulting in lower dropout rates (Bastien, Seifen-Adkins, & Johnson, 2018; Hoyt, 2023).

Being one of the highly preferred destinations for international students, the United Kingdom provides an exceptional context to analyze the impact of student aptitude on academic success. The varied student populace and the academically competitive environment present both challenges and opportunities for international students. Previous research has established that international students typically struggle with academic adaptation, leading to diminished academic performance and higher attrition rates (Sherry, Thomas, & Chui, 2010). However, student aptitude can play a significant role in facilitating this this adaptation process. However, limited research has explored its impact on academic success with reference to UK higher education. Prior literature predominantly focused on native students leaving a significant gap in understanding how these dynamics play out in the context of UK (Moussa, 2021). Additionally, prior research explores factors like language proficiency and cultural adaptation, the specific role of student aptitude as an antecedent of academic success has seldom been addressed. This study intends to address this research gap and provide empirical evidence of the impact of student aptitude on the academic success in the context of higher education in UK. The research contributes to both body of knowledge and practical interventions for improving student outcomes. The primary research question for this research is that, "What is the impact of student aptitude on academic success of international students in higher education?" The corresponding objective of the study is to examine the relationship between student aptitude and academic success amongst international students in UK universities.

2. Literature Review and Hypothesis Development
2.1 Student Aptitude

Student aptitude refers to an individual's inherent ability to perform well in academics. Aptitude comprised of numerous cognitive abilities (critical thinking, problem-solving, and capacity to gain and apply knowledge). Often, it is assessed using standardized test scores, cognitive evaluation and academic achievements (Laidra, Pullmann, & Allik, 2007). Research has shown that aptitude is a strong antecedent of academic performance, whereby, higher levels of aptitude are associated with better academic performance (Richardson, Abraham, & Bond, 2012). However, the methods of conceptualizing and measuring aptitude considerably varies across research, resulting in inconsistent findings and interpretations. Recent researches have also explored the non-cognitive flanks of aptitude (motivation, self-efficacy, and resilience) that also have a crucial role in relation to academic success (Schneider & Preckel, 2017). Such factors often interact with cognitive abilities and enhance or mitigate their effects on academic outcomes. For example, students with high level of cognitive aptitude but lower level of motivation are likely to underperform in comparison to their more motivated counterparts; which emphasize the complex interplay between various constituents of aptitude (Kappe & Van-Der-Flier, 2012). A lack of consensus on the most effective ways to assess and enhance aptitude exists, particularly in diverse educational settings, despite the extant research on the topic. Additionally, the interaction of cognitive and non-cognitive factors of aptitude remains underexplored and limited research has examined these elements. Therefore, exploration of student aptitude is important, particularly in international education contexts to design interventions targeting both cognitive and non-cognitive skills. For international higher education, student aptitude has additional significance. International students encounter unique challenges which includes language barriers, cultural differences, and unfamiliar educational systems. All such challenges can affect students' ability to achieve academic success (Crawford & Wang, 2016). Research has shown that international students with higher aptitude levels are better prepared to adapt to these challenges and perform well academically (Bianchi & Martini, 2023). However, the relationship between aptitude and academic success in this context is not straightforward, since several external factors, like support systems and institutional resources are also in play. Importance of non-cognitive factors in international students' academic success is also emphasized by the prior research. For example, self-efficacy and resilience are found to be particularly important for international students, helping them in overcoming the anxiety and stress related to getting education in foreign

country (Furnham, 2020).

2.2 Student Academic Success and Aptitude

Academic success is multifaceted factor not only comprising of academic performance (measured by GPA or grades) but also includes learners' persistence in studies, achieving educational goals, and timely completion of the degree (York, Gibson, & Rankin, 2019). Multiple factors affect academic success including but not limited to student aptitude, study habits, learning strategies, and external support systems. Research has indicated that students with higher aptitude tend to achieve higher GPAs and are likely to successfully complete their studies (Schneider & Preckel, 2017). According to Lynam et al. (2024) academic success is defined by students as combination of grades, student agency (self-regulation and setting goals), external and institutional support and aptitude (motivation and self-evaluation). Therefore, aptitude is not the only antecedent of academic success. Non-cognitive elements like motivation, self-regulation, orientation and time management, also have a crucial role (Pintrich & De Groot, 1990; Habib, Amir and Khan, 2020). Students having high aptitude but poor time management skills may not be able to meet academic deadlines, resulting in lower grades and academic performance. On the contrary, students with moderate aptitude along with good self-regulation skills may perform better academically (Duckworth, Peterson, Matthews, & Kelly, 2007). Focusing on the dimensions of academic success and their association to student aptitude, research may provide a more nuanced understanding of the aspects contributing to successful academic outcomes. As mentioned earlier, in international higher education academic success is highly challenging. Mulyadi et al (2024) found that international students encounter cultural shocks as a result of homesickness, language barriers, communication issues, and loneliness, which adversely affect their academic success and overall well-being. Research has demonstrated that international students who successfully overcome these challenges tend to perform well academically; however, the ones struggling with adaptation to new academic systems, and cultures, may not perform well and dropout (Bastien, Seifen-Adkins, & Johnson, 2018). According to Moussa (2021), student support services, like advisory system, language support, and mentoring, may enable international students to overcome the complexities of studying in a foreign country. However, to the level up to which these support systems are effective is often contingent upon students' initial aptitude. While the body of research regarding academic success in international education is growing, focus of most of the studies remains on external factors like institutional support and cultural adaptation. Also, the relationship amid student aptitude and academic success in the international higher education is complex and multifaceted. Prior research has constantly demonstrated the favorable outcomes of student aptitude on academic performance, limited research has explored this association in international educational settings. This study addresses this research gap, and hypothesized that:

H1: Student aptitude significantly effect academic success of international students in higher education.

The hypothesis posits the anticipated relationship amid student aptitude and academic success. Testing of this hypothesis in UK higher education context would contribute to the understanding of how student aptitude impacts academic outcomes for international students.

2.3 Theoretical Underpinning

Theoretical underpinning for the current study is provided by Cognitive Load Theory (CLT) (Sweller (1988). CLT proposed that effective learning takes place when cognitive load is optimized, because the learners' cognitive capacity is limited. Regarding the present study CLT helps to explain how student aptitude (cognitive abilities, problem-solving, information processing) effects academic success of the students. Student with higher level of aptitude are better able to manage the cognitive load that help them to integrate and apply complex information effectively, leading to academic success (Sweller, 2020). The theory is very relevant to the present study since it emphasizes the significance of cognitive capacity for academic performance.

3. Methods
3.1 Methodology and Procedures

A quantitative mono-method research methodology was adopted for this research. Survey strategy was used to collect data and examine the association amid student aptitude and academic success of international students. Time horizon adopted for the research was cross-sectional, collecting data at a single point in time. Administering the

survey online, international students enrolled at various UK universities were targeted. The participants were ensured anonymity and confidentiality and informed consent was obtained.

3.2 Population and Sample
Target population for this research included international students studying at UK universities. Convenient sampling technique together with snowball sampling technique was used to choose the study sample. This yielded a total of 748 usable responses. The sample size was considered to be suffice for the study, yielding results with adequate robustness.

3.3 Measures
3.3.1 Student Aptitude
Scale for assessment of student aptitude was adapted from Wolfe and Johnson (1995), which is a previously validated scale. The scale contained 10-items to assess student aptitude (including cognitive and non-cognitive aspects). Five-point anchors ranging from Strongly Agree to Strongly Disagree were used to record responses A sample item from the scale was, "I can solve complex problems effectively." In the present study the scale yielded internal consistency of $\alpha = 0.81$.

3.3.2 Academic Success
Academic Success was evaluated using GPA reported by students. GPA is an objective indicator of academic performance and is commonly used in academic research (Richardson, Abraham, & Bond, 2012). Participants were requested to report their most recent cumulative GPA.

3.3.3 Data Analysis Techniques
After proper screening, the data was analyzed using SPSS-25 software. Demographic characteristics and descriptive statistics were computed first. Correlation coefficient for the study variables was then computer. Finally, regression analysis was performed to examine the effect of student aptitude on academic success. As per recommended practice, linearity, normality, and homoscedasticity assumptions underlying CLRM were examined before running the regression analysis.

4. Data Analysis and Results
Analysis of data conducted using SPSS 25 software. The analysis involved computing sample demographics, descriptive statistics, correlations between study variables and regression analysis to test the study hypothesis.

4.1 Sample Characteristics and Demographics
Table 1, presents the demographics of study participants. The sample (n = 748) was dominated by male students (63%), and respondents of age between 23 to 27 years. Also, almost half (48%) of the participants were pursuing their undergraduate degrees and 36% were Masters students. Participants belonged to various world regions including Asia, Africa, Europe and America. So, demographically the sample was a diverse sample.

Table 1: Sample Demographics

Demographic Variable	Category	Percentage (%)
Age	18-22 years	32
	23-27 years	45
	28-32 years	15
	33 years and above	8
Gender	Male	63
	Female	34
	Non-response	3

	Undergraduate	48
Education Level	Master's	36
	Doctoral	16
	Asia	40
	Africa	25
Region	Europe	15
	North America	13
	South America	7
N=748		

Table 2: Descriptive Statistics

Variable	Minimum	Maximum	Mean	SD	Student Aptitude
Student Aptitude	1.60	4.80	3.72	0.63	
Academic Success (GPA)	2.30	4.00	3.30	0.51	0.62 (p<0.01)

4.2 Descriptive Statistics and Correlations
Descriptive statistics and bi-variate correlation of the focal variables are displayed in Table 2. Correlation analysis showed that student aptitude is significantly positively correlated to students' academic success (r = 0.62) with p-value of lea than 0.01.

Table 3

Regression Analysis Results

Variable	Unstandardized β	Standardized β	t-value	p-value
Constant	1.10	-	4.70	0.000
Student Aptitude	0.65	0.62	12.30	0.000

Dependent Variable: Students' Academic Success

4.3 Results of Regression Analysis
Regression analysis intended to examine the impact of student aptitude on academic success. The model was observed to be statistically significant with F = 151.20, p < 0.01. This indicated that the model reliably predicts academic success in relation to student aptitude. Results indicated significant positive effect of student aptitude on academic success, with a regression coefficient (β) of 0.65. This suggests that for a unit increase in student aptitude, academic success (measured as GPA) is expected to increase by 0.65 points. The R^2 = 0.40 of the model indicates that approximately 40% of the variance in academic success is explained by student aptitude. This shows a meaningful contribution of student aptitude to effect academic performance. Overall, the results supported the hypothesis that in international higher education settings student aptitude is associated with better academic success. The results designate student aptitude as an important antecedent of predicting academic success.

4.4 Discussion on Results

The present study primarily examined the impact of student aptitude on their academic success in international higher education settings. The results provide significant insights into the role of student aptitude in determining the academic success. The results revealed a significant positive association amid student aptitude and academic success among international students. The regression coefficient and R^2 of the model designated students' aptitude to be a strong antecedent of academic success, explaining 40% of the variance in academic success. A statistically significant positive correlation ($r = 0.62$) also supports the hypothesis od student aptitude being significant antecedent of academic success. The findings of the present study are aligned with previous research that demonstrate the significance of student aptitude in academic success. Schneider and Preckel (2017) underscored that students with higher level of cognitive abilities are likely to perform well academically. The finding is also consistent with Lynam et al. (2024), who confirmed that students with higher aptitude levels tend to achieve better academic results. The findings are also in-line with recent literature which has emphasized the role of both cognitive and non-cognitive elements of aptitude in academic success. Savicki, (2023) elaborated how international students having greater cognitive abilities are better equipped to acclimatize to the challenges posed by studying abroad, resulting in better academic outcomes. Likewise, Furnham (2020) argued that non-cognitive factors of aptitude help international students to overcome the anxiety and stress related to studying abroad. Although the present study focus remained on cognitive aptitude, it is equally important to consider that non-cognitive elements are also likely to bear key significance on academic success of international students. Additionally, the results are aligned with the Cognitive Load Theory (Sweller, 1988; Sweller, 2020), which suggests that students having higher cognitive abilities could manage cognitive load in a better manner, which facilitate effective learning and higher academic success. The theoretical perspective emphasizes the importance of cognitive capabilities in academic settings, especially international students who are likely to counter additional challenges (cultural and language barriers). Despite the significant, the findings of the present study do not fully align with few earlier researches. For instance, Kappe and Van-Der-Flier (2012) highlighted the multifaceted relationship amid cognitive and non-cognitive aspects of aptitude and suggested that only high cognitive aptitude may not always result in higher academic performance in case there is a lack of other factors like time management or motivation. Additionally, Sherry, Thomas, and Chui (2010) contended that problems of adaptation to new academic environments faced by international student lead to unfavorable academic performance and higher rates of dropout. These researches recommend that external factors like adopting to new cultures, external support might also significantly affect academic success, possibly having a moderating impact.

4.5 Implications of the Study
The findings of the current study have significant implications for scholars, researchers, practitioners, managers, leaders, and policymakers in the context of international higher education. For scholars and researchers, the study extends the existing body of knowledge with provision of empirical evidence of the significance student aptitude as an antecedent of academic success. The findings imply that cognitive abilities of students are critical contributing factors towards academic performance and inspires additional assessment of cognitive and non-cognitive elements in this regard. The findings are of significance to practitioners and educators in designing more effective student support systems and educational strategies for international higher education. Universities can device couturier academic support programs to address the specific students' needs with varying levels of cognitive abilities, given the importance of student aptitude. Additionally, to identify students requiring additional support and resources, assessment tools to measure student aptitude could be integrated into the admissions process. For managers and leaders of educational institutes, the findings imply fostering of an environment to nurture student aptitude and academic success. By offering professional development programs and creating a culture of inclusivity, universities can better support the academic and personal development of international students. Also, in the context of higher education (Ahmad, Edwin, & Bamber, 2022) found that with implementation of positive organizational behavior framework and coordinated systems, wellbeing of employees can be enhanced. Managers, may use similar interventions for students support and eliminating stressed induced by factor related to studying abroad.

4.6 Limitations of the Study
The sample for the study was large and diverse. Still it may not be fully representative of the diverse body of international students. Together with cross-sectional design of the study this my limit the findings generalizability and validity of the causal relationship. Also, the use of convenient sampling may result in self-selection bias and limiting the sample representativeness. Moreover, the reliance on self-reported data can lead to several biases,

which should be acknowledged as a limitation. Additionally, **t**he scale used for student aptitude is previously validated one, still capturing complete domain of student aptitude is another limitation of this study. Lastly, the scope of the study remained limited to direct relationship of student aptitude and academic success. Non-incorporation of moderating and mediating factors is also a significant limitation.

4.7 Future Research Directions
Future research in this area can employee longitudinal designs together with more robust random sampling techniques to seek deeper understanding of phenomenon. Expanding on the research to include students from different countries and cultural backgrounds could also yield cross-cultural comparisons. Cultural context can even be used as moderating factors. A viable direction for future research could be to examine other relevant factors that can effect academic success like resilience, social integration and emotional intelligence in conjunction with aptitude. This may yield a more wholesome understanding of factors contributing to academic success of international students. Also, the impact of specific interventions to augment student aptitude can be studied by future research. Few such intervention could be mentorship programs, academic skills training, or targeted support services. Moreover, Student aptitude can include various cognitive and non-cognitive or external elements, and exploring the moderating effect of such factors in conceptualization of this study could be a viable direction for future research.

5. Conclusion
The current research study offers a strong evidence of the significant role of student aptitude in enhancing academic success among international students in UK higher education. The findings confirmed the importance of cognitive abilities in academic performance and implies that institutions need to consider student aptitude while designing support systems for international students, and contribute significantly to the existing body of knowledge. Whereas, the study supports the hypothesis that student aptitude is a significant antecedent of academic success, it also raises imperative questions regarding the role of non-cognitive factors and external support systems. While developing strategies for better academic outcomes for international students in higher education, universities should take into account consider these findings. This will ultimately contribute to the student academic success in a competitive and challenging academic environment.

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