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Research Article
Academic Engagement

Towards an Effective Education System: Harnessing Factors to Enhance Students' Performance

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The objective of this study was to assess the impact of student engagement on academic performance. Student engagement refers to participating in scholarly activities and adhering to the university's goals. The study involved 578 students from different higher educational institutes and universities in central India. The results indicate that cognitive engagement, emotional engagement, and behavioral engagement have a significant impact on academic performance. The research findings will assist academic administrators, professors, and governments in improving student performance.

Keywords: academic engagement, cognitive engagement, academic performance, india

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1. Introduction

Recent educational research has emphasized deeper learning, higher-order thinking, self-regulated learning, meta-cognitive learning, non-cognitive skills, and 21st-century skills (Palardy & Rumberger, 2019). The endorsement of these ideas by educational leaders, educators, and researchers reflects a shared belief in prioritizing the development of broad and adaptive skills and knowledge (Hilton & Pellegrino, 2012) (Hilton & Pellegrino, 2012). Fundamental principles unite the various notions, which may originate from different traditions and encompass diverse competencies and skills. Initially, they delineate attitudes, beliefs, and qualities rather than solely focusing on cognitive competencies, such as academic accomplishment and intellect. Scholars have recognized the crucial significance of these competencies and skills for students' learning and success (Gutman & Schoon, 2013) (Hilton & Pellegrino, 2012). Specifically, research has found a correlation between students' academic accomplishment and their academic and behavioral skills such as self-efficacy, teamwork, communication, and self-management (Fredricks et al., 2019; Palardy & Rumberger, 2019). Furthermore, the researchers view academic behavioral skills and engagement as malleable, suggesting they are susceptible to instruction, cultivation, and modification (Gutman & Schoon, 2013). Nevertheless, scholars have underscored the restricted scope of research in this domain, which predominantly concentrates on cognitive abilities rather than non-cognitive abilities and skills such as self-concept, social skills, creativity, and self-control. Furthermore, only a few studies have examined multiple constructs in this area (Hilton & Pellegrino, 2012). As far as I know, the cross-national comparison studies that measure many domains in a single study are still in their early stages. There is a lack of validation studies for instruments that evaluate skill sets, compare groups such as countries and gender, and assess the success of school systems. In the light of this context, the present study seeks to examine the academic, and behavioral skills and engagement of higher educational institutes, as well as their correlation with academic performance in India. The study aims to investigate three main aspects: (1) the internal validity of the measures used; (2) the fairness of these measures across different factors such as students' gender, and socio-economic background; and (3) the relationship between students' academic behavioral skills and engagement and their academic performance. Researchers emphasize the significance of evaluating the authenticity of adolescent responses in self-report surveys (Clark & Malecki, 2019).

2. Literature Review and Theoretical Framework

Scholars have utilized various broad terms, such as 21st-century skills, non-cognitive skills, social and emotional skills, and academic mindsets to denote personality traits, behaviors, skills, and competencies that are crucial in education for enhancing students' learning and achievement. Despite the introduction of these broad categories at different times and with different skill sets, they overlap (Tynan et al., 2020) and concur that non-cognitive skills such as grit, conscientiousness, social skills, and self-concept are equally crucial for academic success as cognitive skills alone (Gutman & Schoon, 2013). The initiatives that promote these principles have a shared understanding that, it is necessary to prioritize the development of versatile and transferable skills and knowledge (Hilton & Pellegrino, 2012). As mentioned earlier, there are multiple theoretical frameworks that encompass diverse types of non-cognitive talents, such as interpersonal and intrapersonal skills. The engagement research incorporates characteristics such as self-efficacy (Okolie et al., 2021) or self-regulation (Archambault et al., 2022) when constructing cognitive engagement. Renninger & Hidi (2020) argue that engagement and motivational variables including objectives, self-efficacy, and self-regulation determine how an individual interacts with the educational environment. (Palardy & Rumberger, 2019) highlighted the connections between specific traits and non-cognitive abilities such as; self-efficacy and self-control (individual), as well as social skills like communication and teamwork (interpersonal). As per the findings (Palardy & Rumberger, 2019), the 21st-century skills framework encompasses student dispositions, various forms of school participation, as well as intrapersonal and interpersonal abilities. Nevertheless, there is a scarcity of research examining abilities across several domains, and as far as we are aware, there is a dearth of cross-national comparative studies that assess these domains.

2.1 Academic Engagement

Engagement has garnered significant interest in the field of education as a potential remedy for the issues of dropout rates, low academic performance, and feelings of detachment (Fredricks et al., 2016). The literature provides many definitions of engagement (Fredricks et al., 2004) and uses multiple ideas interchangeably (Griffiths et al., 2009). According to Boekaerts (2016), engagement refers to a student's active participation and involvement in activities within the school setting. Specifically, it encompasses the student's reactions and interactions with the presented learning content in the physical, instructional, and social environments (p.81). Fredricks et al. (2004) emphasized that there is general agreement in comprehending engagement as a multidimensional concept that encompasses three dimensions: behavioral, cognitive, and emotional engagement. The multidimensionality approach enables us to examine the interconnections among the various sub-dimensions of involvement. While there is widespread consensus that, engagement is a complex concept encompassing behavioral, cognitive, and emotional aspects, recent discussions have highlighted the interconnectedness of these dimensions (Renninger & Hidi, 2020). Although there are varying ideas about how engagement is defined, there is a general agreement and scientific evidence that shows a connection between involvement, academic success, and behavior in school (Furlong & Christenson, 2008). According to multiple researchers, school engagement plays a crucial role in both school dropout and educational achievement (Fredricks et al., 2019; Wang & Eccles, 2012).

Behavioral Engagement(BE)

Behavioral engagement refers to the extent to which students participate in various behaviors, such as attending school regularly, avoiding behavioral difficulties, and actively participating in school or school-related activities. Adolescents exhibit a significant degree of behavioral involvement when they consistently attend classes, refrain from engaging in misconduct, and approach their classes with a positive attitude toward learning (Finn & Zimmer, 2012). The school behaviors mentioned are associated with school success (Nelson & Baltes, 2019). Some researchers have also looked at misbehaviour, problem behaviors, or deviant behaviors to see, if students are engaged or not engaged in their work (Palardy & Rumberger, 2019).

Cognitive Engagement(CE)

Cognitive engagement refers to the extent to which an individual is actively involved in the learning process, demonstrating thoughtfulness, strategic thinking, and a willingness to tackle complex concepts and challenging activities (Fredricks et al., 2004). The literature has employed various methods to measure cognitive engagement. Teachers commonly derive observable characteristics, such as time-on-task, class engagement, and homework completion, from their observations of students' classroom behavior (Finn & Zimmer, 2012). Conversely, researchers have utilized students' self-reports that specifically emphasize their engagement in schoolwork and their ability to persevere in the face of challenging topics (Reeve & Tseng, 2011). In addition, certain scholars have highlighted the importance of students' cognitive engagement in academic efforts (Chi & Wylie, 2014).

Emotional Engagement(EE)

Emotional engagement is defined as the level of interest in school and encompasses both positive and negative attitudes towards teachers, pupils, and the school itself. This encompasses a sense of belonging and a connection to the subjects under study (Chan-Olmsted & Wolter, 2018). Some researchers conducted analyses on various psychological states such as happiness, anxiety, and sorrow (Taylor & Statler, 2014), while others concentrated on the socioemotional components of schooling (Usán Supervía & Salavera Bordás, 2019) or the sense of belonging and value in school (Wang & Eccles, 2012). Furthermore, certain research has indicated that there is a correlation between elevated levels of emotional involvement, increased levels of cognitive engagement, and good behavior in an educational setting (Siddiq et al., 2020).

2.2 Academic Performance(AP)

Academic accomplishment of students is frequently utilized as a dependent variable in educational research to determine the factors that influence success in academic (Zahedi et al., 2021). Furthermore, both subjective and objective assessments of students' academic performance are

employed. While these approaches exhibit distinct differences, the researchers emphasize their respective merits and drawbacks. Self-reported academic performance is commonly assessed using characteristics such as self-efficacy, curiosity, academic ambitions, and/or self-expectations, as well as teachers' expectations of performance. Furthermore, it is regarded as more cost-effective and simpler to assess in conjunction with other subjective factors such as attitudes, perceptions, and emotions. Additionally, it could be susceptible to bias due to students' tendency to either overestimate or underestimate their own competency. Performance-based measurements are more laborious and expensive since they need the development of credible assessments by teachers or other individuals. However, they often yield more objective, accurate, and dependable results. In the realm of ICT competence (Aesaert et al., 2017), and other disciplines (Kaiser et al., 2013), scholars have examined the precision and partiality of students' self-reported and performance-based competence. Based on the above discussion, the conceptual framework for this research is shown in figure 1.

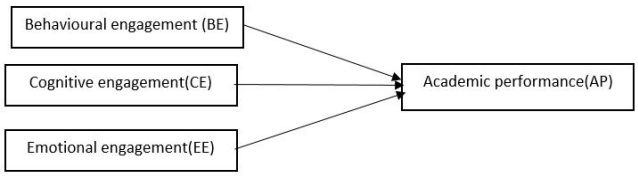

Figure 1: Conceptual framework

The following hypotheses are framed on the above conceptual framework:

H1: The students' behavioral engagement significantly influences the academic performance.

H2: Cognitive engagement of students are significantly determining the academic performance.

H3: The students' emotional engagement significantly impacts on academic performance.

3. Study Methodology

3.1 Sample and Procedure

The data was obtained via cross-sectional convenience sampling. This sampling technique is efficient in terms of time and cost, making it well-suited for conducting preliminary studies on fresh issues (Schreuder et al., 2001). The study's sample size was based on the requirements of structural equation modeling (SEM).

The study involved a total of 700 graduate and postgraduate students from central India. The surveys were conducted in between January 2024 and April 20, 2024. After the initial screening process, 337 out of the 389 respondents were considered for further study. Male students accounted for 59.7% of the sample, while 44.6% of them were post-graduate students. The study sample included the science stream (33.5%), the commerce stream (31.9%), and the arts stream (35.6%).

3.2 Measures

The assessment of the students' engagement was conducted using a construct consisting of 24 items, which were designed to measure three dimensions: behavioral (6 items), cognitive (7 items), and emotional (11 items). Fazilat Siddiq's research (Siddiq et al., 2020) served as the source of all the above items. Studentsuseda 4-point Likert scale to assess their level of agreement with various statements. The scale ranged from 1 (indicating strong disagreement) to 4 (indicating strong agreement).The self-reporteditems were to measure the three aspects of the students' academic performance: (1) their expected academic achievement (i.e., how well they thought they would do in school this year, rated on a 5-point Likert scale); (2) how interested they were in their homework (rated on a 5-point Likert scale); and (3) how they thought their teachers would grade their work as students (rated on a 4-point Likert scale).

4. Results and Analysis

The model underwent empirical testing using structural equation modeling (SEM) approaches, specifically based on the partial least squares (PLS) method and was implemented using the R programming language. Partial Least Squares (PLS) regression is a useful technique for assessing data during the initial stages of theory building and verification (Hair et al., 2019).

The measuring model was evaluated based on its internal reliability (IR), convergent validity (CV), and discriminant validity (DV). The internal reliability of the measurements was assessed using Cronbach's alpha and composite reliability (CR) ratings. The construct's DV and CV were measured using the "average variance extracted" (AVE) method, as proposed by Fornell & Larcker (1981) and Hair et al. (2019), as shown in Table 1.

The estimated loadings of the significant constructs ranged from 0.71 to 0.79, surpassing the necessary threshold of 0.5 (Hair et al., 2019). Cronbach's alpha and composite reliability (CR) were employed to assess the internal consistency of the concept. The coefficients for Cronbach's alpha ranged from 0.69 to 0.81, while the composite reliability (CR) values ranged from 0.77 to 0.84. The values for all measures for all constructs exceeded the recommended threshold of 0.7, indicating that the internal reliability was moderate to high (Fornell & Larcker, 1981; Hair et al., 2019).

Table 1: Construct Validity

Constructs	Items	Loading	Cronbach' Alpha	CR	AVE
BE	6	0.76	0.79	0.81	0.68
CE	7	0.79	0.81	0.84	0.69
EE	11	0.71	0.69	0.77	0.63
AP	3	0.75	0.73	0.77	0.65

In addition, Fornell and Larcker (1981) discovered that the square root of AVE for each of the constructs fell within the range of 0.79 to 0.83 (shown in boldface) and smaller than the respective correlation of the constructs with other constructs (Table 2). This demonstrates the construct's validity.

Table 2: Constructs DV

Constructs	Mean	SD	BE	CE	EE	AP
BE	2.89	0.09	0.82			
CE	2.91	0.04	0.31	0.83		
EE	2.73	0.10	0.33	0.29	0.79	
AP	2.63	0.13	0.39	0.38	0.36	0.80

The proposed study model was evaluated using the "goodness of fit" (GoF), "path coefficients," and "coefficient of determination" (R2) to assess its overall performance. According to Alolah (Alolah et al., 2014), the GoF is computed as $((GoF = \sqrt{\overline{AVE} * R^2})$. The recommended threshold value, according to the GoF, was 0.36. The model's GoF value is 0.69, above the criterion. Hence, the model's overall quality is satisfactory.

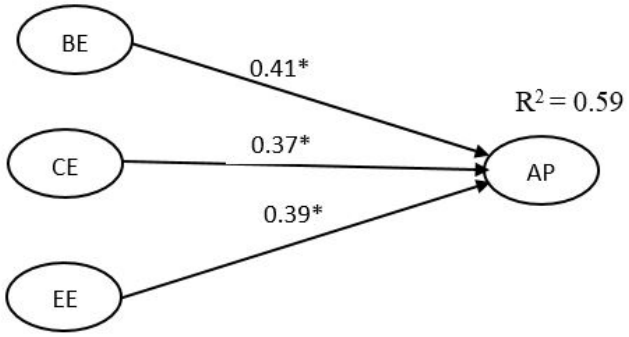

Figure 2: Direct relations

Figure 2 illustrates the coefficients of the direct connections between BE, CE, EE, and AP. The variables BE, CE and EE exhibit significant and direct impacts on AP, with path coefficients of 0.41, 0.37 and 0.39, respectively. These findings indicate that BE, CE and EE have a significant impact on students' academic performance. Therefore, the findings confirm the hypotheses H1, H2 and H3.

The research findings determined that student engagement in the academic course work can serve as a general indicator of their performance. This is consistent with the results of other investigations as documented in the literature (Anderson, 2016; Huei, 2014; Rajabalee et al., 2020). Further, the correlation between engagement and performance among the students is significant. However, the association between these variables is not very strong. This highlights the limitations of the classical model of knowledge acquisition in learning, which primarily relies on observational learning behaviors. This results are in line with Holmes (Holmes, 2018) and Rajabalee (Rajabalee et al., 2020). According to Santally and Senteni (Santally & Senteni, 2004), the course designers must guarantee that the courses address the three essential phases: information acquisition, knowledge application, and knowledge creation. Creating an environment that effectively models student involvement can improve learning results by utilizing smart learner scaffolds and individualized support.

5. Conclusion, Limitations and Future Scopes

After considering the research data from a holistic viewpoint, we have determined that behavioural engagement is the most powerful indicator of academic achievement or success among graduate and postgraduate students. Students who possess a

strong belief in their own ability to succeed and who are capable and willing to take academic action will be able to self-motivate and engage in the cognitive tasks necessary for success. The findings indicated that affective involvement, behavioral engagement, and mental engagement all played a role in predicting academic performance. Therefore, it is crucial to prioritize the activities that promote cognitive engagement in educational environments.

The current research has certain drawbacks. Using a longitudinal approach, we can design future studies to examine the variables that predict academic performance. Researchers from other countries may find it advantageous to conduct research with larger sample sizes, similar to the examples found in the literature (Rajabalee et al., 2020). To gain a deeper understanding of engagement, academic motivation, self-efficacy, and academic achievement the researchers can use associative studies to assess their linkages. It would be advantageous to design a research study encompassing additional regions and urban areas to enhance academic performance in terms of scientific knowledge and practical application.

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