UNIVERSITY OF CAPE COAST

ECONOMICS STUDENTS' MOTIVATIONAL ORIENTATIONS, SELF-REGULATED LEARNING AND ACADEMIC ENGAGEMENT IN HIGHER EDUCATION: A STRUCTURAL EQUATION MODELLING APPROACH

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BY

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Thesis submitted to the Department of Business and Social Sciences Education of the Faculty of Humanities and Social Sciences Education of the College of Education Studies, University of Cape Coast, in partial fulfilment of the requirements for the award of Doctor of Philosophy Degree in Economics Education

JULY 2024

DECLARATION

Candidate's Declaration

I hereby declare that this thesis is the result of my own original research and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Signature ……………………………Date …………………..

Name: Francis Arthur

Supervisors' Declaration

We hereby declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines on supervision of thesis laid down by the University of Cape Coast.

Principal Supervisor's Signature………………………Date…………………

Name: Alhaji Prof. Mumuni Baba Yidana

Co-supervisor's Signature……………………………Date…………………

Name: Dr. Bernard Yaw Sekyi Acquah

ABSTRACT

In the dynamic landscape of higher education, understanding the factors that influence Economics students' self-regulated learning and academic engagement is paramount. This study delves into the intricate interplay between Economics students' motivational orientations, self-regulated learning strategies, and their academic engagement using a Structural Equation Modelling (SEM) approach. The study was quantitative research that adopted a descriptive cross-sectional census design. In all, 452 undergraduate Economics students were involved in the study. Motivational orientations, self-regulated learning, academic engagement and academic support scales were adapted as the data collection instruments. Both descriptive (frequency and percentages, mean and standard deviation) and inferential statistics were used to analyse the data that were obtained. The study found that the Economics students had high motivational orientations, self-regulated learning and academic engagement. The study also revealed no statistically significant differences in self-regulated learning and academic engagement based on gender and academic level. Again, it was found that academic self-efficacy, task value orientation, mastery approach and performance-avoidance goal orientations had significant influence on Economics students' self-regulated learning. Finally, it was revealed that the lecturer's academic support negatively moderated the positive relationship between self-regulated learning and academic engagement. It was recommended that curriculum developers and Economics educators should design Economics curricula that challenge higher education students intellectually while providing opportunities for independent learning and problem solving.

KEYWORDS

Academic engagement

Agentic engagement

Artificial neural network

Economics

Higher education

Motivational orientations

Self-regulated learning

Structural equation modelling

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DEDICATION

To my wife Sharon Abam Nortey (Ohemaa), and daughter Doxa Abigail Nana Yaa Arthur (Anuonyam)

TABLE OF CONTENT

LIST OF TABLES

LIST OF FIGURES

CHAPTER ONE

INTRODUCTION

Education in the fourth industrial revolution (4IR) [Education 4.0] has called on students in higher education to become lifelong learners. In order for this to happen, higher education students need to self-regulate their learning. However, evidence from educational empirical studies in some parts of the globe has shown that students' self-regulated learning is affected by their motivational orientations. Additionally, some empirical studies have indicated a relationship between students' self-regulated learning and their academic engagement. Therefore, this study examines the motivational orientations, self-regulated learning, and academic engagement of Economics students in higher education using a hybrid approach combining Structural Equation Modelling and Artificial Neural Network (SEM-ANN).

Background to the Study

Higher education has been urged to move away from traditional teaching, which solely focuses on students' knowledge of subject matter and their ability to pass examinations (Anane, 2020). Instead, there is a growing demand for a shift towards focusing on students' motivational orientations and self-regulatory factors related to teaching and learning (Anane, 2020). According to Lewin and Stuart (2003), students' ideals must be nurtured and rewarded to serve as lifelong motivators. Learning the content area alone is not enough; students also need to learn how to self-regulate their learning process (Antonelli, Jones, Burridge & Hawkins, 2020; Higgins, Frankland & Rathner, 2021).

Motivational orientation is an essential element in fostering academic growth, particularly in the context of higher education. Educators and researchers have long grappled with the difficulty of sustaining students' motivation levels throughout their higher education experience with the ultimate objective of achieving academic success *(*Abello, Alonso-Tapia & Panadero, 2021; Kelmendi & Nawar, 2016; Senior, Bartholomew, Soor, Shepperd, Bartholomew & Senior, 2018*)*. Motivational orientation refers to an individual's inherent tendencies, attitudes, and inclinations towards engaging in various activities, pursuing goals, and achieving desired outcomes (Frumos, Leonte, Candel & Ciochină-Carasevici, 2024). It encompasses the underlying factors that drive and direct a person's behaviour, choices, and persistence in the face of challenges. Motivational orientations include intrinsic goal orientation, extrinsic goal orientation, task value, control of learning beliefs, self-efficacy, test anxiety, and achievement goal orientation (Elliot & Murayama, 2008; Frumos et al., 2024; Pintrich & De Groot, 1990; Pintrich, Smith, García & McKeachie, 1991).

The academic success, self-regulation and engagement of students is influenced by a multitude of interconnected psychological factors, with some of the most crucial ones including orientation towards learning goals (Dinger & Dickhäuser, 2013; Cerasoli & Ford, 2014; Keys, Conley, Duncan & Domina, 2012), and motivational orientation elements (Alhadabi & Karpinski, 2020; Bai & Wang, 2023; Muwonge, Schiefele, Ssenyonga & Kibedi, 2019; Stegers-Jager, Cohen-Schotanus & Themmen, 2012). Motivational orientations of students influence their learning process and academic performance (Abello et al., 2021; Vandewalle, Nerstad & Dysvik, 2019).

In the twenty-first century, lifelong learning has played a vital role in addressing global issues such as health, climate crises, and technological transformation (UNESCO, 2022). Lifelong learning relies on self-regulated learning (SRL), which emphasises independent and self-directed actions aimed at enhancing knowledge and skills (Lüftenegger, Schober, van de Schoot, Wagner, Finsterwald, & Spiel, 2012; Wigfield, Klauda & Cambria, 2011). SRL is recognised as the focal point of learning in this era (Anthonysamy, Koo & Hew, 2020). Students who effectively regulate their learning processes exhibit improved academic performance (e.g., Hidayat, 2021; Richardson, Abraham & Bond, 2012) and a heightened sense of well-being (Davis & Hadwin, 2021).

A global characteristic of higher education is the opportunity and necessity for students to self-regulate their learning (Dresel et al., 2015). Higher education is typically characterised by complex and concurrent achievement tasks and great autonomy regarding learning organisation, learning materials, specific learning goals, and learning procedures. Successful implementation of SRL is particularly crucial for students in higher education, given their greater responsibility and autonomy than those in elementary and secondary schools (Jansen, van Leeuwen, Janssen, Jak & Kester, 2019; Sitzmann & Ely, 2011). Higher education students face many challenges when acquiring and refining their knowledge (Tauber & Ariel, 2023). They are assigned educational activities to complete independently, and they learn new information in preparation for class assessments. In order to succeed, students must effectively take charge of their learning to meet achievement goals and maintain knowledge over time.

The concept of self-regulated learning has attracted growing attention over the past three decades due to its valuable heuristic nature (Martínez-López, Moran, Mayo, Villar & Tinajero, 2023). This interest stems from its capacity to serve as a model for academic learning and its inspiration for educators aiming to comprehend how students can attain engagement and autonomy (Huang, Zhou, Wang, Wang, Liu, Shi, Chen, Yang & Pan, 2023; Schunk & Greene, 2018). Self-regulated learning is the process of activating and maintaining cognitions, affects, and actions when students address learning objectives while interacting with environmental factors. It is conceptualised as a self-directed process initiated and sustained by metacognition, including cognitive and metacognitive and resource management strategies (Schunk & Zimmerman, 2013; Zeidner & Stoeger, 2019).

Cognitive and metacognitive strategies involve direct approaches to learning tasks and higher-order thinking processes for planning, monitoring, and regulating cognitive activities (Efklides, 2017). These strategies include rehearsal, elaboration, organisation, critical thinking and metacognitive self-regulation (Araujo, Gomes & Jelihovschi, 2023; Zeidner & Stoeger, 2019). On the other hand, resource management strategies refer to the intentional and strategic allocation of cognitive, metacognitive, and motivational resources to enhance the learning process (Al-Abdullatif, Al-Dokhny & Drwish, 2023). This includes time and study environment management, effort regulation and peer learning (Araujo et al., 2023; Hands & Limniou, 2023). These skills collectively constitute a foundational competence crucial for academic success and life-long learning (OECD, 2018).

Higher education (HE) Economics courses provide a rigorous academic experience that immerses students in economic theories, principles and applications. These courses cover diverse areas such as microeconomics, macroeconomics, econometrics, and specialised areas such as labour economics, international trade, and environmental economics (de Muijnck & Tieleman, 2022). Beyond fundamental concepts, an economics education in higher education emphasises critical analysis, empirical research, and policy implications, equipping students with problem-solving and analytical skills essential for understanding complex economic phenomena and making informed decisions (Volpe, 2015). In addition, interdisciplinary perspectives allow students to explore the intersections between economics, sociology and other disciplines, fostering a holistic understanding of socio-economic dynamics (Hass, 2020).

Given the intellectually demanding nature of higher education economics, the development of self-regulated learning (SRL) skills is critical to students' academic and career success (Wang, 2021; Wu, 2024). SRL enables students to take control of their learning, set meaningful goals and adopt adaptive strategies to achieve them (Mejeh, Sarbach & Hascher, 2024; Taranto & Buchanan, 2020). In economics education, where students need to master complex theories, analyse empirical data and synthesise different perspectives, SRL helps them to manage their time, resources and cognitive efforts effectively. By promoting metacognitive awareness, SRL enhances autonomy and resilience, enabling economics students to overcome academic challenges and excel in their future careers as economists, policy makers and researchers. In addition, students pursuing a Bachelor of Education with a major in Economics need to develop both content knowledge and pedagogical approaches to teach Economics effectively at the pre-tertiary level. As future educators, these pre-service Economics teachers need strong SRL skills to facilitate lifelong learning and effective teaching.

There is a growing concern about students' academic engagement globally (Mahama, Dramanu, Eshun, Nandzo, Baidoo-Anu & Amponsah, 2022). The increasing relevance of student engagement is attributed to the assertion that high levels of student engagement serve as a crucial and rewarding avenue for achieving academic success (Bowden, Tickle & Naumann, 2021). In academic contexts, engagement appears necessary for promoting high academic success (Lam et al., 2018; Lei, Cui & Zhou, 2018). Previous research indicates that self-regulated learning and student engagement play a crucial role in fostering student academic achievement (Panadero, 2017; Sakurai & Pyhalto, 2018). Alonso-Tapia and Ruiz-Díaz (2022) also observed a connection between academic engagement and self-regulation. Moreover, empirical studies across diverse educational levels and contexts consistently indicate a positive correlation between self-regulated learning and academic engagement (Cleary, Slemp & Pawlo, 2021; Li & Lajoie, 2022).

Research also suggests that SRL can serve as a mediator between motivation and academic engagement (Baars, Wijnia & Paas, 2017; El-Adl & Alkharusi, 2020; Hayat, Shateri, Amini & Shokrpour, 2020), but this mediating role remains largely unexamined in Economics education. In addition, studies have highlighted the importance of teacher support in improving student SRL and academic engagement (Azila-Gbettor & Abiemo, 2021; Laxdal, Mjåtveit, Leibinger, Haugen & Giske, 2020; Liu, Zhen, Ding, Liu, Wang, Jiang & Xu, 2018; Miao & Ma, 2023; Sadoughi & Hejazi, 2023).

Gender has long been implicated in educational research as a determinant of learning styles, preferences and academic performance (Ali et al., 2023; Ambaye, 2024; Li & Qiu, 2018; Tsaousis & Alghamdi, 2022). Studies have shown mixed results regarding gender differences in SRL and academic engagement, with some suggesting that male students have stronger SRL skills (Appiah-Kubi, Amponsah, Nti-Adarkwah & Asoma, 2022), while others find no significant gender differences (Anazifa, Limiansi & Pratama, 2023; Stanikzai, 2020). Similarly, studies of academic engagement show inconsistencies, with some highlighting significant gender differences (Ganiyu, 2021; Hartono, Umamah, Sumarno & Puji, 2019), while others report no such differences (Amoah, Britwum, Acheampong & Sefah, 2021; Zhao, Narasuman & Ismail, 2023). These discrepancies highlight gender as a relevant factor in understanding the SRL of business students.

In addition, academic level plays a crucial role in students' SRL and engagement, with research suggesting that higher academic levels require greater autonomy and self-regulation (Guo, 2020; Tang & Neber, 2008). However, while some studies report higher extrinsic motivation across academic levels (Diseth, Mathisen & Samdal, 2020), others suggest a combination of intrinsic and extrinsic motivational orientations (Khan, Khan & Ayub, 2022). These studies further emphasise the need to consider both gender and academic level when understanding students' self-regulated learning and academic engagement.

In the light of this, educators worldwide have been urged to implement measures that use self-regulated learning and student engagement (Mahama et al., 2022). Therefore, recognising the critical roles of motivational orientations, self-regulated learning and academic engagement in ensuring high-quality tertiary education, this study examined Economics students' motivational orientations, self-regulated learning and academic engagement in higher education using structural equation modelling.

Statement of the Problem

Lifelong learning is a key priority for promoting equity and sustainability in society (Mejeh et al., 2024). The ability to engage in lifelong learning is one of the aims of teacher education as stipulated in the National Teaching Standards (NTS, 2017). Goal 4 of the Sustainable Development Goals (SDGs) for 2030 is to 'ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.' According to Mejeh et al. (2024), "self-regulated learning (SRL) is a fundamental requirement for achieving successful lifelong learning" (p. 1). Self-regulated learning is relevant for Economics students being prepared for lifelong learning and the capacity to transfer skills, knowledge, and abilities (Russell et al., 2022).

However, a growing body of research shows that most undergraduate students face a range of new challenges in their academic engagement, primarily due to the changed circumstance in the learning and study environment and a corresponding failure to engage in self-regulated learning (Broadbent & Poon, 2015; Hadwin & Winne, 2012; Papageorgiou, 2022). Also, studies have shown that many students are not competent in self-regulated learning, especially after experiencing years of teacher-directed "traditional" learning in formal education – where the teacher directs the learning objectives and means (Morris & Rohs, 2021).

Anecdotal experience of the researcher reveals that some higher education Economics students wait for the lecturer to come to the lecture theatre before they try to organise themselves to study the course materials, while others also exhibit the opposite. This may result from the subject's complex nature or the students' motivational orientations. Some of the concepts (e.g., market failure, market structure, fiscal policy multipliers, rational expectations, prisoner's dilemma) and theories (e.g., theory of consumer behaviour, game theory, Solow growth model) of economics demand that, apart from what is taught in the lecture theatre, students conduct extensive research and consult others for better understanding. This will require students to have the inner drive represented here as self-regulated learning and fortitude for lifelong learning, which will eventually influence their academic engagement and success.

It is worth noting that there is a growing body of research on students' motivational orientations and self-regulated learning. For example, Anane (2020), Anthonysamy et al. (2020), and Jensen et al. (2019) examined students' motivational orientations and self-regulated learning. Other studies have also focused on personality traits and self-regulated learning (Mahama et al., 2022), personality traits and students' motivation (Nyarko, Kugbey, Amissah, Ansah-Nyarko & Dedzo, 2016), and students' academic engagement and academic performance (Essiam, 2019). Yet, little is known about the motivational orientations of Economics students in higher education; hence, this study intends to fill this gap by examining Economics students' motivational orientations.

In addition, other empirical studies have focused on students' level of self-regulated learning; however, findings from these studies have yielded conflicting results. Some studies have revealed that students exhibit low levels of self-regulated learning (Mahama et al., 2022), moderate self-regulated learning (Appiah-Kubi et al., 2022), and high levels of self-regulated learning (Dorrenbacher & Perels, 2016; Ozan, Gundogdu, Bay, & Celkan, 2012). These conflicting results may be attributed to differences in the study population. For instance, Mahama et al. focused on college of education students, while Appiah-Kubi et al. (2022), Dorrenbacher and Perels (2016), and Ozan et al. (2012) sampled senior high school students.

Moreover, other studies have focused on the differences in self-regulated learning (e.g., Noviani, Istiqomah, Wibowo & Sabandi, 2023; Stanikzai, 2019) and academic engagement (e.g., Appiah-Kubi et al., 2022; Canchola González & Glasserman-Morales, 2020) based on gender. Canchola González and Glasserman-Morales also observed that the level of academic engagement among students may be influenced by certain demographic profiles, including gender and academic level. Additionally, studies (e.g., Liao, Zhang, Yang & Fei, 2023; Liu et al., 2018; Sadoughi & Hejazi, 2023) have focused on the influence of teacher support on academic engagement. However, these studies (e.g., Appiah-Kubi et al., 2022; Noviani et al., 2023) failed to consider the interaction effect of gender and academic level on students' self-regulated learning and academic engagement.

Also, these empirical studies (e.g., Anane, 2020; Appiah-Kubi et al., 2022; Mahama et al., 2022) rarely investigated moderators such as academic level, gender, and lecturer academic support towards the understanding of motivational orientations, self-regulated learning, and academic engagement. Specifically, there is a notable gap in research addressing the moderating role of academic level in the relationship between motivational orientations and self-regulated learning among Economics students. In addition, it seems that moderators, such as lecturers' academic support and gender, in the context of the relationship between Economics students' self-regulated learning and academic engagement are lacking in the literature. Moreover, it appears that other studies have not focused on the mediating role of self-regulated learning in the relationship between motivational orientations and academic engagement.

To elaborate further, in an attempt to holistically examine the influence of motivational orientations on self-regulated learning and self-regulated learning on academic engagement, structural equation modelling (SEM) appears to be the appropriate statistical technique. Becker, Cheah, Gholamzade, Ringle, and Sarstedt (2023) emphasised that SEM is recognised as an appropriate statistical tool for evaluating complex structural models. Also, other studies (e.g., Al-Sharafi, Al-Emran, Iranmanesh, Al-Qaysi, Iahad & Arpaci, 2022; Arpaci, Karatas, Kusci & Al-Emran, 2022; Quan, Tan, Aw, Cham, Basu & Ooi, 2024) have highlighted the significance of using Artificial Neural Network (ANN) in conjunction with PLS-SEM due to the latter's inability to capture non-linear relationships. However, these studies (e.g., Anane, 2020; Anthonysamy et al., 2020; Mahama et al., 2022; Nyarko et al.,

2016) have not utilised any robust statistical analytical tools to examine the complex relationships between motivational orientations, self-regulated learning, and academic engagement in Higher Education. This is a critical research gap from the methodological perspective and highlights the importance of this current study as it examined Economics students' motivational orientations, self-regulated learning, and academic engagement in Higher Education using SEM and ANN approaches.

Assumptions of the Study

This study is grounded on certain assumptions. The assumptions in effect, form the yardstick by which conclusions about the study can be made. The assumptions are:

1. Higher education Economics students perceive their motivational orientations, self-regulation and academic engagement as important in the Economics education programme.
2. The study assumes that there are causal relationships between motivational orientations, self-regulated learning, and academic engagement. For example, it may be assumed that certain motivational factors lead to specific self-regulated learning behaviours, which, in turn, influence academic engagement.
3. It is assumed that the higher educational environment remains relatively consistent during the data collection period, without significant changes or interventions that could impact students' motivational orientations, self-regulated learning, or academic engagement.

Purpose of the Study

The study employed descriptive cross-sectional survey design to examine undergraduate Economics students' motivational orientations, self-regulated learning and academic engagement in higher education with a particular focus on the University of Cape Coast using PLS-SEM-ANN. The essence of the PLS-SEM-ANN was to provide a robust analytical tool to explain the complex relationships between undergraduate Economics students' motivational orientations, self-regulated learning and academic engagement. The specific objectives of the study were formulated based on this purpose.

Research Objectives

The specific objectives of the study were to:

1. examine undergraduate Economics students' level of motivational orientations.
2. investigate undergraduate Economics students' level of self-regulated learning.
3. examine undergraduate Economics students' level of academic engagement.
4. ascertain the difference in undergraduate Economics students' self-regulated learning based on gender and academic level.
5. determine the difference in undergraduate Economics students' academic engagement based on gender and academic level.
6. ascertain the influence of undergraduate Economics students' motivational orientations on their self-regulated learning.
7. determine the influence of undergraduate Economics students' self-regulated learning on their academic engagement.

8. ascertain the moderating role of gender in the relationship between undergraduate Economics students’ self-regulated learning and academic engagement.
9. examine the moderating role of lecturer’s academic support in the relationship between undergraduate Economics students’ self-regulated learning and academic engagement.
10. determine the moderating role of the levels of undergraduate Economics students in the relationship between motivational orientations and self-regulated learning.
11. ascertain the mediating role of undergraduate Economics students’ self-regulated learning in the relationship between motivational orientations and academic engagement.

Research Questions

The following research questions were stated to guide the study:

1. What is the level of motivational orientation of undergraduate economics students?
2. What is the level of undergraduate Economics students’ self-regulated learning?
3. What is the level of academic engagement of undergraduate economics students?

Research Hypotheses

The following research hypotheses were formulated and tested in the study:

1. H_0: There is no statistically significant difference in undergraduate Economics students’ self-regulated learning based on gender and academic level.

H_1: There is a statistically significant difference in undergraduate Economics students' self-regulated learning based on gender and academic level.

2. H_0: There is no statistically significant difference in undergraduate Economics students' academic engagement based on gender and academic level.

   H_1: There is a statistically significant difference in undergraduate Economics students' academic engagement based on gender and academic level.

3. H_0: There is no statistically significant influence of undergraduate Economics students' motivational orientations on their self-regulated learning.

   H_1: There is a statistically significant influence of undergraduate Economics students' motivational orientations on their self-regulated learning.

4. H_0: There is no statistically significant influence of undergraduate Economics students' self-regulated learning on their academic engagement.

   H_1: There is a statistically significant influence of undergraduate Economics students' self-regulated learning on their academic engagement.

5. H_0: Gender does not moderate the relationship between undergraduate Economics students' self-regulated learning and academic engagement.

H_1: Gender moderates the relationship between undergraduate Economics students' self-regulated learning and academic engagement.

6. H_0: Lecturer's academic support does not moderate the relationship between undergraduate Economics students' self-regulated learning and academic engagement.

   H_1: Lecturer's academic support moderates the relationship between undergraduate Economics students' self-regulated learning and academic engagement.

7. H_0: Levels of Economics students does not moderate the relationship between undergraduate Economics students' motivational orientations and self-regulated learning.

   H_1: Levels of Economics students moderates the relationship between undergraduate Economics students' motivational orientations and self-regulated learning.

8. H_0: Undergraduate Economics students' self-regulated learning does not mediate the relationship between motivational orientations and academic engagement.

   H_1: Undergraduate Economics students' self-regulated learning mediates the relationship between motivational orientations and academic engagement.

Significance of the Study

The findings of this study require the attention and proactive engagement of stakeholders, including Economics students, teacher educators (lecturers), and university authorities. This study has significant implications for lecturers and educators in shaping their pedagogical practice. Understanding students' motivational orientations, self-regulated learning, and academic engagement allows lecturers to tailor their teaching methods to align with their needs and preferences. Insights gained from this study may inform the development of targeted instructional strategies that enhance motivation and foster self-regulated learning, ultimately contributing to improved academic engagement. Lecturers could use these findings to design courses that resonate with students' motivation and promote a more effective and engaging learning environment.

This study provides valuable information for university authorities for institutional planning and resource allocation. Insights into the motivational orientations, self-regulated learning, and academic engagement levels may guide the development of support programmes and initiatives aimed at enhancing the overall student experience. By understanding Economics students' specific needs and challenges, university authorities could implement policies that foster a conducive learning environment, ensuring that resources are strategically allocated to address the identified areas of concern.

This study directly benefits students by shedding light on the factors influencing their academic experiences. Awareness of their motivational orientations, self-regulated learning behaviours, and levels of academic engagement might empower them to reflect on their learning styles and make informed decisions about their academic journey. The findings may also guide students in seeking appropriate support mechanisms, such as mentorship or academic counseling, to enhance their learning outcomes. Ultimately, the study promotes a student-centred approach, encouraging individuals to take an active role in their education and fostering a sense of agency in their academic pursuits.

Policy makers in the education sector can leverage the study's findings to inform evidence-based policy decisions. Identifying gender and academic level differences in self-regulated learning and academic engagement may provide policy makers with insights into potential areas of inequality that may require targeted interventions. Additionally, understanding the moderating roles of gender and academic support in the relationship between self-regulated learning and academic engagement could guide the development of inclusive policies that address diverse student needs. Policy makers might use these insights to advocate for systemic changes that promote a supportive and equitable learning environment within the broader educational landscape.

This study significantly advances knowledge in the field of education, particularly in the domain of Economics students' experiences in Higher Education. By examining motivational orientation, self-regulated learning, and academic engagement, this study might enhance our understanding of the complex interplay between psychological and behavioural factors that influence student learning outcomes. The empirical findings add to the existing body of knowledge and offer a nuanced perspective on how these dimensions interact within the context of economics education. This new knowledge creates opportunities for future research, allowing scholars to explore the intricacies of student motivation, learning strategies, and academic engagement across various academic disciplines.

In terms of methods, the study's significance lies in its utilisation of both Structural Equation Modeling (SEM) and Artificial Neural Network

(ANN) approaches. This methodological pluralism enhances the robustness of the research by employing sophisticated statistical techniques to analyse complex relationships within the data. The integration of SEM allows for a structural examination of latent variables, while the use of ANN, a machine learning approach, offers the flexibility to capture non-linear patterns and relationships. The combination of these methodologies contribute to the methodological toolkit in educational research and sets a precedent for interdisciplinary approaches that can yield more comprehensive insights into the dynamics of student learning experiences.

Finally, in terms of practical implications, the findings of this study could offer actionable insights for educators, policymakers, and educational institutions. Understanding how motivational orientations impact self-regulated learning and, in turn, academic engagement allows for developing tailored interventions to enhance student experiences. Educators can adapt instructional strategies to align with students' motivational needs, and institutions can implement support programs that address the specific challenges identified in the study. This practical significance extends to improving pedagogical practices and developing evidence-based policies that foster a conducive learning environment for Economics students in Higher Education.

Delimitation

The study specifically concentrated on the motivational orientations, self-regulated learning, and academic engagement of Economics students in higher education, with a particular focus on the University of Cape Coast. The choice to examine the University of Cape Coast exclusively was driven by the controlled environment it offered to investigate the motivational orientations, self-regulated learning, and academic engagement of Economics students. Additionally, the study exclusively involved students pursuing a Bachelor of Education (B.Ed) in the Social Sciences with a major in Economics.

Limitations

The quantitative approach employed in this study may restrict the comprehension of the complex factors that shape students' motivational orientations, self-regulated learning, and academic engagement. On the other hand, qualitative methods can offer more in-depth insights into individual experiences, viewpoints, and contextual subtleties that quantitative data may not capture.

Additionally, it is necessary to acknowledge that the intricate relationship between motivational orientation, self-regulated learning, and academic engagement cannot be fully understood through numerical measurements alone as they may not capture the nuances and complexity of these constructs. However, Structural Equation Modelling (SEM) and Artificial Neural Network (ANN) have helped overcome this limitation.

Furthermore, the study's focus on a specific student group within the Bachelor of Education (B.Ed) Social Sciences programme, specifically those majoring in Economics at the University of Cape Coast, may limit the generalisability of its findings. The experiences and characteristics of this particular group may not be representative of Economics students in other academic programmes or institutions, which could affect the external validity of the study.

Operational Definition of Terms

Academic engagement: Academic engagement refers to the level of interest, involvement, and effort that students invest in their academic activities.

Artificial Neural Network Approach: It is a machine learning technique designed to recognise patterns, make predictions, or perform other tasks by simulating the way biological neurons interact.

Economics students: Economics students are individuals who are enrolled in academic programmes or courses related to the field of Economics.

Motivational orientations: Motivational orientation refers to the underlying reasons and psychological processes that drive individuals to engage in specific activities or pursue particular goals.

Self-regulated leaning: Self-regulated learning (SRL) is a process in which individuals actively and autonomously manage their own learning experiences. **Structural Equation Modelling**: Structural Equation Modelling (SEM) is a robust statistical technique used in the analysis of relationships between endogenous and exogenous variables.

Higher education: Higher education refers to the educational level beyond secondary school, typically provided by colleges, universities, and other institutions of learning.

Organisation of the Study

The study is structured into five chapters. The first chapter provides an introduction to the study, including the background, problem statement, research purpose, research questions, research hypotheses, significance, delimitations, limitations, and an overview of the study's organisation. The second chapter examines relevant literature related to the study, categorised into theoretical, conceptual, and empirical reviews. In the third chapter, the methodological approach of the study is outlined, encompassing research philosophy, approach, design, population, respondents, data collection instruments, validity and reliability tests, data collection procedures, ethical considerations, and data processing and analysis. The fourth chapter presents the collected data's results and their corresponding discussions. Lastly, the fifth chapter summarises the study, presents conclusions, provides recommendations, discusses the study's contributions, and suggests directions for further research.

CHAPTER TWO

LITERATURE REVIEW

Overview

This chapter comprehensively explores factors such as motivational orientations, self-regulated learning, and academic engagement. The chapter is structured into three sections: theoretical review, conceptual review, and empirical review. The theoretical review section examines expectancy-value theory, self-regulated learning theory and engagement theory. The following concepts: motivational orientations, self-regulated learning and academic engagement, which guides the study follows. In the empirical review section, related empirical studies are reviewed.

Theoretical Review/Theoretical Foundation

The theoretical review, also known as the theoretical foundation, plays a vital role in any research study as it provides a comprehensive understanding of the existing theories that underpin the study. This section critically examines and synthesises relevant theories and literature that inform the study's conceptual framework. By delving into the existing body of knowledge, the theoretical review establishes the foundation for the research study, helping to justify the research questions and hypotheses.

Expectancy-Value Theory

Eccles and Wigfield (2002) proposed the expectancy-value theory, highlighting the importance of individuals' beliefs about their competence and the subjective value they attach to specific tasks or goals. This theory suggests that individuals with high expectancy and task value are more likely to have a mastery-oriented motivational orientation and engage in tasks for the inherent satisfaction of learning and personal growth (Eccles & Wigfield, 2002).

Eccles and Wigfield (2002) proposed the expectancy-value theory, highlighting the importance of individuals' beliefs about their competence and the subjective value they attach to specific tasks or goals. The expectancy-value theory, as a crucial theoretical framework in the literature, offers insights into individuals' motivational orientations and their influence on learning behaviour (Wigfield & Eccles, 2000; Wigfield, Eccles, Fredricks, Simpkins, Roeser & Schiefele, 2015). From the perspective of this theoretical model, motivation is defined as the processes enabling individuals to choose suitable goals and successfully pursue them (Elliott, 1983). In this context, motivational factors are considered integral components of an individual's goal structures and beliefs regarding what holds significance (Ames, 1992).

Within the expectancy-value theory, expectancy is characterised as an individual's beliefs regarding their ability to successfully execute a goal-oriented action, specifically focusing on competence-related beliefs in certain tasks (Wigfield et al., 2015). Notably, this aligns with Bandura's self-efficacy theory, where expectancies for success and self-efficacy are frequently treated as a shared general factor in the literature (Ball, Huang, Cotten, Rikard & Coleman, 2016; Bandura, 1997).

The theory further elaborates on the concept of value, denoting the perceived worth attributed to a task's achievement, enjoyment, and usefulness (Wigfield et al., 2015). This value component comprises three distinct elements: attainment value or importance, intrinsic value, and utility value associated with the task. Thus, within the expectancy-value theory, motivation is intricately linked to expectancy, representing individuals' confidence in task competence, and value, reflecting the subjective assessment of a task's significance and utility (Wigfield et al., 2015).

Intrinsic value corresponds to the concept of intrinsic motivation (Deci, Vallerand, Pelletier, & Ryan, 1991; Ryan & Deci, 2000; Ryan & Deci, 2020; Wigfield & Eccles, 2000). On the other hand, utility value aligns with the construct of extrinsic motivation (Deci & Ryan, 1985; Ryan & Deci, 2020) as it encompasses more externally driven reasons for task engagement, such as pursuing a task to achieve a specific outcome. This study adopts the expectancy-value theory as its theoretical framework to explore the motivational orientations of Economics students and the associations between ten motivational variables—namely, academic self-efficacy, control of learning beliefs, extrinsic goal orientation, intrinsic goal orientation, task value orientation, test anxiety, mastery approach goal orientation, mastery avoidance goal orientation, performance-approach goal orientation, performance-avoidance goal orientation, and self-regulated learning.

Expectancy-value theory, as elucidated in this study, aligns with examining students' motivational orientations and their impact on self-regulated learning. This theoretical framework posits that students' expectations regarding their ability to succeed in Economics, coupled with the subjective value they attribute to the subject and learning process, are likely to shape their engagement in self-regulated learning strategies. For example, if Economics students perceive the course as personally relevant and believe in their capacity to perform well, they are more inclined to employ proactive self-regulated learning techniques.

In a broader context, Eccles and Wigfield (2002) underscored the importance of comprehensively understanding how diverse motivational factors, including task values and self-efficacy, collectively influence behaviours associated with academic achievements, such as self-regulated learning. Empirical evidence from studies such as those conducted by Bai and Wang (2023; 2021) further reinforces this notion, highlighting the significant predictive role of motivational orientations, such as self-efficacy beliefs and task value, in shaping various aspects of self-regulated learning behaviours.

Self-Regulated Learning Theory

Self-regulated learning theory, proposed by Zimmerman and Schunk (2001), is a cognitive constructivist approach that focuses on individuals' ability to control and direct their learning processes (Zimmerman & Schunk, 2001). According to this theory, learners actively engage in a cyclical process of setting goals, monitoring their progress, applying strategies, and evaluating their performance (Zimmerman & Schunk, 2001).

The foundation of self-regulated learning theory lies in the belief that learners are not passive recipients of information but active participants in their learning (Zimmerman & Schunk, 2001). They have the capacity to set meaningful goals that align with their learning objectives and use self-monitoring techniques to assess their progress towards these goals (Zimmerman & Schunk, 2001). By engaging in metacognitive processes, learners can identify their strengths and weaknesses and adjust their learning strategies accordingly (Zimmerman & Schunk, 2001).

Self-regulated learners also employ various self-regulatory strategies to enhance their learning outcomes. These strategies include planning, organising, and managing their time effectively (Zimmerman & Schunk, 2001). Additionally, learners engage in self-instruction, guiding themselves through the learning process by using self-explanation and self-questioning techniques (Zimmerman & Schunk, 2001). They also use self-reinforcement, rewarding themselves for achieving milestones and staying motivated (Zimmerman & Schunk, 2001).

The self-regulated learning theory has been widely applied in educational settings. Teachers can facilitate self-regulated learning by providing explicit instruction on goal setting, self-monitoring, and strategy use (Zimmerman & Schunk, 2001). They can also create a supportive learning environment that encourages students to take ownership of their learning and fosters autonomy (Zimmerman & Schunk, 2001).

Numerous studies have provided evidence for the effectiveness of self-regulated learning in enhancing academic achievement. For example, Panadero and Alonso-Tapia (2014) found that self-regulated learning strategies positively correlated with students' performance in various academic subjects. Similarly, Pintrich (2004) conducted a meta-analysis and reported a significant positive relationship between self-regulated learning and academic achievement.

This theory emphasises that students’ motivational beliefs are an imperative precursor to self-regulation (Schunk & Zimmerman, 2008). Park (2022) reiterated that the primary factor that facilitates students’ persistence in their academic tasks is their motivational beliefs. Self-regulated learning theory emphasizes the key role of motivational orientation in instigating and maintaining students’ self-regulation in learning. In this study, motivational orientations (e.g., academic self-efficacy, control of learning beliefs, extrinsic goal orientation, intrinsic orientation, task value orientation, test anxiety, mastery approach goal orientation, mastery avoidance goal orientation, performance-approach goal orientation, and performance-avoidance goal orientation) were hypothesised to influence self-regulated learning.

The use of self-regulated learning theory in this study provides a robust foundation for exploring the intricacies of self-regulated learning among students in higher education, particularly within Economics. Self-regulated learning theory posits that individuals actively engage in a cyclical process of setting goals, monitoring their progress, employing strategies to attain these goals, and reflecting on their effectiveness. In higher education Economics, students are expected to autonomously regulate their learning activities to grasp complex Economic concepts and theories effectively. By examining the extent to which Economics students engage in self-regulated learning practices, this study aims to shed light on their ability to effectively manage their learning processes within this specialised academic domain.

Central to this investigation is exploring how self-regulated learning practices influence academic engagement among Economics students at the higher education level. Academic engagement encompasses various facets of student involvement, including their level of participation in class activities, their depth of understanding course materials, and their overall investment in academic pursuits. Through the lens of self-regulated learning theory, this study seeks to elucidate the extent to which students' proactive regulation of their learning processes affect their academic engagement. By delineating the intricate relationship between self-regulated learning and academic engagement within Economics education, this research provides valuable insights into the factors that contribute to students' academic success and satisfaction within this discipline.

Furthermore, by elucidating the interplay between self-regulated learning and academic engagement in Economics, this study contributes to a broader discourse on effective pedagogical practices and student learning outcomes in higher education. Understanding how students in Economics courses employ self-regulated learning strategies to enhance their academic engagement not only informs instructional approaches tailored to the unique needs of Economics students but also underscores the importance of fostering self-regulatory skills across disciplines. By promoting self-regulated learning practices in Economics education, educators can empower students to become active agents in their learning journey, equipping them with essential skills for lifelong learning and professional success in Economics and beyond.

Engagement Theory

Engagement theory, proposed by Kearsley and Schneiderman (1999), focuses on the active involvement of learners in the learning process, emphasising the importance of their emotional and cognitive engagement (Kearsley & Schneiderman, 1999). According to this theory, learners are more likely to achieve meaningful and long-lasting learning outcomes when actively engaged and motivated in their educational experiences (Kearsley & Schneiderman, 1999).

Engagement theory suggests that various strategies and practices can foster learners' engagement. These include creating a supportive and inclusive learning environment, promoting active participation and collaboration, incorporating real-world applications and problem-solving activities, and providing timely and constructive feedback (Kearsley & Schneiderman, 1999). These strategies aim to enhance learners' motivation, interest, and intrinsic satisfaction, increasing their engagement and promoting deeper learning.

In recent years, the engagement theory has gained further prominence and widely discussed and applied in educational research and practice. Researchers have examined the relationship between learner engagement and various educational outcomes, such as academic achievement, retention rates, and student satisfaction. For example, Wang, Bao, Liu and Zhang (2023) conducted a study examining the impact of learner engagement on academic performance and found a significant positive correlation between engagement and students' grades.

Furthermore, technology-mediated learning environments have provided new opportunities to enhance learner engagement. Online learning platforms and interactive digital tools can be designed to incorporate elements that promote engagement, such as gamification, multimedia resources, and collaborative learning features (Martin, Parker & Deale, 2022). These technological advancements have allowed educators to create dynamic, interactive learning experiences that cater to diverse learner preferences and foster active engagement.

However, it is important to note that engagement theory has challenges and limitations. The concept of engagement itself can be multifaceted and subjective, making it challenging to measure and assess accurately (Fredricks, Blumenfeld & Paris, 2004). Additionally, individual differences, external distractions, and contextual factors can influence learners' engagement levels, making it a complex and dynamic construct to understand and promote effectively.

Moreover, as proposed by Kearsley and Schneiderman (1999), engagement theory highlights the significance of learners' active and meaningful involvement in the learning process. By fostering engagement through various strategies and practices, educators can enhance learners' motivation, interest, and intrinsic satisfaction, ultimately promoting deeper and more effective learning.

Engagement theory provides a comprehensive framework for understanding the various dimensions of academic engagement among students, particularly in the context of learning Economics. In a study examining Economics students' academic engagement through these dimensions, each dimension is critical in shaping students' learning experiences and outcomes in Economics. For instance, behavioural engagement is essential for students to actively participate in lectures, seminars, and practical exercises, allowing them to interact with the subject matter and apply theoretical concepts to real-world scenarios.

Cognitive engagement is fundamental for students to develop a deep understanding of Economic theories, principles, and analytical tools, enabling them to analyse complex economic phenomena, make informed decisions, and contribute to Economic discourse and policymaking. In addition, emotional engagement is crucial for fostering students' interest, motivation, and passion for Economics, which can sustain their commitment to learning and pursuing excellence in the field despite encountering challenges or setbacks. Moreover, agentic engagement empowers students to take ownership of their learning journey in Economics, encouraging them to set ambitious goals, seek learning opportunities beyond the classroom, and develop the skills and mindset needed to thrive in a dynamic and competitive Economic landscape.

Interaction of the Theories

The interaction of expectancy-value theory, self-regulated learning theory and engagement theory provides a structured understanding of how economics students' academic engagement develops through motivation, self-regulation and active participation. Expectancy-Value Theory explains why students are motivated to learn by emphasising their beliefs about competence and the value they place on academic tasks (Eccles & Wigfield, 2002). When students perceive learning as valuable and believe in their ability to succeed, they are more likely to engage in self-regulated learning behaviours. This motivational foundation serves as the driving force behind students' efforts to manage their own learning, making motivation a key determinant of self-regulation.

Self-regulated learning theory builds on this motivational foundation by explaining how students take control of their learning processes (Zimmerman & Schunk, 2001). Motivated students actively use strategies such as goal setting, time management, metacognitive reflection and strategic study techniques to optimise their academic performance. Through self-regulation, students transform their motivation into meaningful actions that enhance their learning experience. However, self-regulated learning does not occur in isolation; it is reinforced by engagement, which determines how consistently students apply these strategies. When students persist in their learning efforts and adapt their strategies in response to challenges, they maintain their engagement in academic tasks.

Engagement Theory completes the picture by emphasising the role of external influences and meaningful learning experiences in sustaining student engagement (Kearsley & Schneiderman, 1999). Whereas expectancy-value theory explains the reasons for motivation and self-regulated learning theory describes the strategies students use, engagement theory emphasises the importance of students' academic engagement. When students use self-regulated learning strategies in an engaging learning environment, they become more cognitively, emotionally and behaviourally involved in their studies. This dynamic interaction between motivation, self-regulation and engagement provides a holistic understanding of undergraduate Economics students' motivational orientations, self-regulated learning and academic engagement.

Conceptual Review

Meaning of Motivational Orientations

Motivational orientation refers to an individual's inclination or disposition towards specific goals, motives, or incentives that drive their behaviour, engagement, and achievement in various domains, including education (Eccles & Wigfield, 2002). It reflects an individual's underlying motivation and can significantly impact their approach to learning, persistence, and overall performance.

Pintrich, Smith, Garcia, and McKeachie (1993) proposed six motivational orientations: academic self-efficacy, control of learning beliefs, extrinsic goal orientation, intrinsic orientation, task value orientation and test anxiety. Then later on, Elliot and Murayama (2008) added the achievement goal orientation components: mastery approach goal orientation, mastery avoidance goal orientation, performance-approach goal orientation, and performance-avoidance goal orientation.

Pintrich et al. (1993) categorised these orientations into value component (intrinsic goal orientation, extrinsic goal orientation, and task value orientation), expectancy component (academic self-efficacy, control of learning beliefs) and affective component (test anxiety). This study considered mastery approach goal orientation, mastery avoidance goal orientation, performance approach goal orientation, and performance avoidance goal orientation under the value component.

Goal orientation pertains to a student's perception of the reasons behind engaging in a learning task (Bandhu, Mohan, Nittala, Jadhav, Bhadauria & Saxena, 2024; Pintrich, 2000; Wigfield & Cambria, 2010). It refers to the student's general goals or orientation to the entire course. Intrinsic goal orientation focuses on the extent to which a student sees their participation in a task-driven by factors like challenge, curiosity, and mastery (Peker, 2024). When a student possesses an intrinsic goal orientation, their involvement in the task is an end rather than a means to an end. Complementing intrinsic goal orientation, extrinsic goal orientation deals with the degree to which a student views their participation in a task-driven by external factors such as grades, rewards, evaluation by others, and competition (Anane, 2020; Bandu et al., 2024). High extrinsic goal orientation indicates that engaging in a learning task is a means to an end, with the student's main concerns relating to issues not directly tied to the task, such as grades, rewards, and comparisons with others (Tsai, Wu & Chen, 2024). Like intrinsic goal orientation, this concept refers to the overall orientation to the course.

Task value orientation differs from goal orientation by focusing on the student's evaluation of how interesting, important, and useful a task is ("What do I think of this task?") [Wigfield et al., 2015]. In contrast, goal orientation examines the reasons behind the student's participation in the task ("Why am I doing this?"). A high task value should lead to greater involvement in one's learning. Task value relates to students' perceptions of the course material regarding interest, importance, and utility.

The achievement goal orientations are mastery approach goal orientation, mastery avoidance goal orientation, performance-approach goal orientation, and performance-avoidance goal orientation (Alhadabi & Karpinski, 2020; Al-Harthy, 2016; Elliot, 1999). The concept of achievement goal has been understood in two main ways: as an inherent, enduring trait and as a variable that can be influenced by situational factors (Ames, 1992; Du, Wang, Ma, Luo, Wang & Shi, 2020; Jagacinski, Madden & Reider, 2001). Mastery goals focus on skill development and task mastery. In order words, mastery orientation refers to a student's aim to master a skill or comprehend content thoroughly (Datu, Chiu, Mateo & Yang, 2024; Huang & Sang, 2024). Also, performance-approach goals aim for high performance and positive assessments of competence. Performance orientation involves students striving to exhibit superior performance compared to others or predetermined benchmarks (Lei, 2024). Conversely, performance-avoidance goals aim to evade low performance and negative competence assessment (Abello et al., 2021). This suggests that avoidance orientation occurs when students avoid appearing less intelligent than their peers.

Control of learning refers to students' belief that their learning efforts will yield positive outcomes. It involves the belief that outcomes depend on one's own effort, as opposed to external factors like the teacher (Wahyuningsih, Qohar, Azizah, Asmianto & Atan, 2024). If students believe that their studying efforts make a difference in their learning, they are more likely to study strategically and effectively. Essentially, if students perceive control over their academic performance, they are more inclined to invest the necessary effort strategically for desired changes.

Academic self-efficacy is the self-assessment of an individual's belief in their capacity to master academic tasks, which includes both the judgment of their capability to accomplish a task and their confidence in their skills to perform it (Bai, Chao & Wang, 2019; Paloș, Vîrgă & Okros, 2024). In the context of Economics students, academic self-efficacy plays a pivotal role in shaping their learning experiences and outcomes. Students with high levels of academic self-efficacy tend to approach their Economics coursework with confidence and determination, believing in their ability to understand complex Economic theories, solve intricate problems, and excel in their academic endeavours. This belief in their capabilities not only influences their academic performance but also affects their motivation to persist through challenges and setbacks encountered in the learning process. Conversely, students with low academic self-efficacy may experience doubt, anxiety, and reluctance when faced with demanding Economics tasks, which can hinder their learning progress and diminish their overall academic achievement.

However, test anxiety is found to have a negative correlation with expectancies and academic performance. It comprises two components: a worry, or cognitive component, and an emotionality component. The worry component involves negative thoughts that disrupt performance, while the emotionality component relates to the affective and physiological arousal aspects of anxiety (Anane, 2020). Cognitive concern and preoccupation with performance are significant sources of performance decrement. Training in effective learning strategies and test-taking skills is suggested to reduce anxiety levels.

Meaning of Self-Regulated Learning

Self-regulated learning (SRL) is a comprehensive concept viewed from a social cognitive perspective. According to Zimmerman (2015), SRL refers to learners' voluntary efforts to manage and maintain the cognitive, behavioural, and motivational aspects of learning. This process occurs in a cyclical loop consisting of three phases: the initial planning phase, the execution phase, and the reflective phase. Each phase involves various sub-processes. Numerous studies have underscored the importance of SRL in various learning contexts, highlighting that individuals equipped with SRL skills can actively regulate their metacognitive (Efklides, 2011; Greene, 2021), behavioural (Frazier, Schwartz & Metcalfe, 2021), and motivational processes (Schunk & DiBenedetto, 2020; Zimmerman, 2008) to achieve their objectives.

Extensive research has highlighted the indispensability and benefits of acquiring self-regulated learning (SRL) skills across various educational stages (Dignath, Buettner & Langfeldt, 2008). The COVID-19 pandemic and the consequent shift to remote learning emphasised the criticality of SRL skills in enabling students to navigate unprecedented circumstances (Sarva, Linde & Daniela, 2021). Furthermore, SRL holds significance in formal learning settings and informal learning environments, future professional endeavours, and has been recognised as a key competency for lifelong learning (Ifenthaler, 2012; Taranto & Buchanan, 2020). Self-regulated learning (SRL) has been advocated as a pivotal factor in fostering proactive and continuous learning throughout one's life (Yong & Sokumaran, 2023).

Researchers assert that self-regulated learning transpires when learners proactively establish learning objectives and subsequently monitor, adapt, and assess their cognitive processes, motivation, emotions, behaviours, and surroundings to accomplish those goals (Chou, Hsieh & Pan, 2024; Greene, Bernacki & Hadwin, 2024).

Self-regulated learning is a purposeful and iterative procedure comprising three phases (preparation, execution, and reflection). During these phases, learners autonomously employ various strategies to establish attainable and specific learning objectives, sustain their motivation, manage their emotions, and monitor and assess their advancement towards the set goals (Zimmerman & Moylan, 2009).

Self-regulation entails individuals actively observing, managing, and contemplating their own learning experiences (Vosniadou, Bodner, Stephenson, Jeffries, Lawson, Darmawan, Kang, Graham & Dignath, 2024). Students who possess self-regulation exhibit qualities related to motivation, metacognition, emotions, and behaviour that contribute to an enhanced learning process.

Pintrich et al. (1993) observed that self-regulated learning could be divided into cognitive and metacognitive strategies (rehearsal, elaboration, organisation, critical thinking, and metacognitive self-regulation), and resource management strategies (time and study environment management, effort regulation, peer learning and help-seeking). In this study, the various dimensions of self-regulated learning proposed by Pintrich et al. (1993) were adapted to measure Economics students' self-regulated learning. The various dimensions of self-regulated learning were defined by Pintrich et al. (1993).

Basic rehearsal strategies involve vocalising or naming items from a list to activate information in working memory rather than storing it in long-term memory (Schunk, 2005). While suitable for simpler tasks, these strategies are believed to influence attention and encoding processes, yet they may not facilitate the construction of internal connections among information or its integration with existing knowledge (Weinstein, Acee & Jung, 2011). Additionally, elaboration strategies aid in storing information in long-term memory by establishing internal connections between items (Ha, Roehrig & Zhang, 2023; Weinstein et al., 2011). Techniques such as paraphrasing, summarising, creating analogies, and generative note-taking help learners integrate new information with their existing knowledge.

Organisation strategies assist learners in selecting pertinent information and establishing connections among the information to be learned. Techniques like clustering, outlining, and identifying main ideas in reading passages contribute to an active, effortful process, engaging learners closely in the task and potentially leading to improved performance (Ha et al., 2023). Also, critical thinking measures how students apply prior knowledge to solve problems, make decisions, or critically evaluate situations against predefined standards (Karaer, Hand & French, 2024).

Metacognition involves the awareness, knowledge, and control of cognition, focusing on the control and self-regulation aspects of self-regulated learning. Metacognitive self-regulation includes planning (goal setting and task analysis), monitoring (tracking attention, self-testing, and questioning), and regulating (fine-tuning and continuous adjustment of cognitive activities), aiming to enhance performance by assisting learners in checking and correcting their behaviour during a task. Apart from regulating cognition, effective students must manage and regulate their time and study environments. Time management encompasses scheduling, planning, and effective use of study time, varying from daily to weekly and monthly scheduling (Hensley, Wolters, Won & Brady, 2018; Peker, 2024). Study environment management pertains to creating an organised, quiet, and distraction-free setting for academic work (Peker, 2024).

Self-regulation extends to controlling effort and attention amidst distractions and less engaging tasks. Effort regulation reflects a commitment to achieving study goals even in challenging circumstances, signifying goal commitment and regulating the continued use of learning strategies (Komarraju & Nadler, 2013). Peer learning is when students collaborate with other students (Newman, 2002). Collaborating with peers positively impacts achievement. Dialogue with peers can aid in clarifying course material and gaining insights not easily attained individually. In line with peer learning, students also seek help in the course of learning, which is called help-seeking. Managing support from peers and instructors is crucial. Recognising one's limitations and seeking assistance from peers or teachers is a hallmark of successful students, with research indicating that peer help, tutoring, and teacher assistance facilitate academic achievement (Ha et al., 2023).

Concept of Academic Engagement

Research into engagement has primarily originated from professional and occupational settings (Sinval, Casanova, Marôco & Almeida, 2021). Within these environments, engagement is defined as a positive psychological condition characterised by vigor, dedication, and absorption, all linked to well-being in the context of work (Bakker, Schaufeli, Leiter & Taris, 2008; Hirschi, 2012; Schaufeli & Bakker, 2010). More recently, there has been an extension of the study of engagement in educational settings, particularly within higher education (Christenson & Pohl, 2020; Christenson, Reschly & Wylie, 2012; Kuh, 2009; Vasalampi, Salmela-Aro & Nurmi, 2009). These investigations are frequently observed in international research focused on academic learning and achievement (Krause & Coates, 2008; Schaufeli, Martinez, Pinto, Salanova & Bakker, 2002).

The important role of academic engagement in student development has attracted recent researchers' interest in examining how to promote students' academic engagement (Stroet, Opdenakker & Minnaert, 2013; Wang & Eccles, 2013). Academic engagement among students is characterised by the time, intention, and energy dedicated to educationally sound activities (Sinval et al., 2021). Engagement, being a broad meta-construct, presents challenges due to varying definitions within and across different types of engagement (Fredricks, Filsecker & Lawson, 2016). Two prominent conceptualisations have emerged in academic contexts, sparking recent debates (Senior, Bartholomew, Soor, Shepperd, Bartholomew & Senior, 2018). Schaufeli et al. (2002) adapted the Utrecht Work Engagement Scale (UWES) from a business perspective to measure student engagement in university settings. The UWES–Student version (UWES-S) retained the three dimensions of work engagement (vigor, absorption, and dedication), adapted to the university context by rephrasing some original UWES items.

Fredricks et al. (2004) proposed another conceptualisation, defining academic engagement as a multidimensional construct encompassing behavioural, emotional, and cognitive dimensions. However, criticisms have been raised regarding both conceptualisations, emphasising the need for clarity and differentiation among dimensions within adopted frameworks (Fredricks et al., 2004).

Theoretical frameworks overlapping with previous literature in academic engagement highlight the necessity for clear definitions and differentiation between dimensions (Fredricks, 2015). The academic engagement literature calls for measures that carefully consider these dimensions, avoiding content overlap and enhancing the utility of psychometric instruments (Fredricks et al., 2004). In response to criticisms, Maroco, Maroco, Campos and Fredricks (2016) developed the University Student Engagement Inventory (USEI), encompassing behavioural, cognitive, and emotional dimensions. The behavioural dimension involves attendance, punctuality, task completion, participation, and adherence to social and institutional rules. The cognitive dimension pertains to students' thoughts, perceptions, and strategies related to knowledge acquisition, study methods, and academic self-regulation. The emotional dimension encompasses positive and negative feelings related to the learning process, class activities, peers, and teachers.

Academic engagement refers to students' active and enthusiastic participation, involvement, and investment in their learning activities and academic tasks (Fredricks et al., 2004). It encompasses behaviours, emotions, and cognitions that reflect students' dedication, interest, and commitment to their educational experiences. This definition suggests that academic engagement describes the degree to which students involve themselves in learning-related activities, including behavioural, affective and cognitive engagement that underlie students' connectedness to academics (Appleton, Christenson, & Furlong, 2008; Fredricks, Blumenfeld, & Paris, 2004; Fredricks & McColskey, 2012).

Research has shown that academic engagement is a multifaceted construct with several dimensions (Walker & Koralesky, 2021). One commonly studied dimension is behavioural engagement, which refers to observable actions and participation in learning activities (Fredricks et al., 2004). This includes active involvement in classroom discussions, completion of assignments, and overall attentiveness during instructional sessions.

Another dimension is emotional engagement, which involves students' affective experiences and feelings towards their learning and school environment (Fredricks et al., 2004). Emotional engagement includes positive emotions such as interest, enjoyment, and excitement and negative emotions such as boredom or anxiety related to academic tasks.

Lastly, cognitive engagement relates to students' intellectual efforts, thinking processes, and depth of learning (Fredricks et al., 2004). It involves students' ability to apply critical thinking problem-solving skills and effective learning strategies to enhance their understanding and mastery of academic content.

Moreover, Reeve and Tseng's (2011) proposed that academic engagement has four dimensions such as "cognitive," "behavioural," "emotional," and "agentic." The term "agentic component" in this model denotes students' constructive contributions to learning (Reeve & Tseng, 2011). Additionally, Veiga (2016) explored engagement in school, encompassing cognitive, emotional, behavioural, and agentic dimensions. The agentic component is defined as an active interest and heightened self-confidence in learning and knowledge acquisition.

The concept of "agentic engagement" pertains to how students intentionally and proactively seek to customise and improve their learning experience and the environment in which it takes place (Fletcher, 2016; Reeve & Jang, 2022; Reeve & Shin, 2020). To illustrate, during the learning process, students may internally generate suggestions, express their preferences, pose questions, engage in discussions about their needs and thoughts, propose goals and objectives, articulate their interests, request resources or learning opportunities, explore solutions to questions, seek further clarification of instructions, and make choices (Mehran, 2014). Also, Shernoff, Kelly, Tonks, Anderson, Cavanagh, Sinha and Abdi (2016) characterised agentic engagement as the interactive dynamic between teachers and students.

This current study employed a four-dimensional approach to academic engagement, encompassing the cognitive, behavioural, emotional, and agentic dimensions. The extensive literature informed this on engagement originating from professional and occupational settings, and the conceptualisation of academic engagement has garnered significant attention within higher education contexts. While previous research has predominantly focused on conceptualisations rooted in either the Utrecht Work Engagement Scale or the multidimensional framework proposed by Fredricks et al. (2004), recent critiques have underscored the necessity for clarity and differentiation among dimensions within adopted frameworks. To address these concerns, Maroco et al. (2016) developed the University Student Engagement Inventory (USEI), which encompasses behavioural, cognitive, emotional, and agentic dimensions, aligning with the multifaceted nature of academic engagement.

Drawing on theoretical frameworks that emphasise the importance of clear definitions and differentiation between dimensions, the inclusion of the agentic component in the conceptualisation of academic engagement, as proposed by Reeve and Tseng (2011) and Veiga (2016), provides a comprehensive understanding of students' active and enthusiastic participation, involvement, and investment in their learning activities and academic tasks. Therefore, adopting a four-dimensional approach to academic engagement, encompassing cognitive, behavioural, emotional, and agentic dimensions, not only aligns with existing theoretical frameworks but also responds to the call for measures that carefully consider these dimensions, enhancing the utility of psychometric instruments, and promoting a nuanced understanding of students' engagement in higher education settings

Research has consistently highlighted the positive impact of academic engagement on various educational outcomes. For example, a study by Wang, Shen and Mavilidi (2021) examined the relationship between academic engagement and academic performance in higher education. The findings indicated that students who were more academically engaged demonstrated higher levels of academic achievement.

Furthermore, academic engagement has been linked to increased student satisfaction, improved classroom behaviour, and higher retention rates (Fredricks et al., 2004). It also plays a crucial role in fostering a positive and supportive learning environment and facilitating students' overall well-being and sense of belonging within the academic community.

Meaning of Lecturer Academic Support

Teacher support includes academic and emotional support (Johnson, Johnson, Buckman, & Richards, 1985; Patrick, Kaplan & Ryan, 2011). Specifically, teacher academic support describes students' belief that the teacher cares about what and how much the students have learned, and teacher emotional support reflects students' perception that the teacher cares about the students as different individuals (Johnson et al., 1985). The two concepts are distinct constructs (Johnson, Johnson, & Anderson, 1983) as they distinguish teacher–student interaction under a classroom context from such an interaction under a general social context. Meanwhile, the two concepts are closely correlated to constitute a single measure (Wentzel, 1997) as they both come from the teacher and occur in a real class situation.

Adequate support and good rapport with teachers can create a caring climate that provides a secure environment for students to explore and engage (Birch & Ladd, 1997; Furrer & Skinner, 2003). Teacher support is a very important facilitator for student learning as teachers are important organisers of classroom activities (Patrick, Ryan, & Kaplan, 2007; Simons-Morton & Chen, 2009).

Likewise, lecturer's academic support refers to the assistance, guidance, and resources provided by instructors or lecturers to facilitate students' academic success, learning, and engagement (Hagenauer, Hascher & Volet, 2015). It involves various forms of support, such as clarifying course content, offering feedback, providing additional resources, and creating a supportive learning environment.

Research has shown that an effective lecturer's academic support can positively impact students' academic outcomes and overall learning experience. For instance, a study by Nunn, Barrow and Anda (2020) examined the role of lecturer support on student engagement and satisfaction in higher education. The findings revealed that students who perceived higher levels of support from their lecturers reported greater engagement and satisfaction with their learning.

Lecturer's academic support can take different forms. One important aspect is the clarity and organisation of instructional materials and course content. Clear communication of expectations, learning objectives, and explanations of complex concepts can enhance students' understanding and reduce confusion (Kember, 2009). Providing timely and constructive feedback is crucial for supporting students' learning and improvement. Effective feedback helps students identify their strengths areas for improvement and guides how to enhance their performance (Hattie & Timperley, 2007).

Moreover, lecturers can offer additional resources and opportunities for students to deepen their understanding and extend their learning beyond the classroom. This can include recommending relevant readings, providing supplementary materials, or facilitating access to academic support services (Lizzio, Wilson & Sim, 2002). Creating a supportive and inclusive learning environment is also an important aspect of lecturer's academic support. By fostering a positive classroom climate, encouraging active participation, and demonstrating approachability and responsiveness, lecturers can help students feel valued, motivated, and supported in their learning journey (Hagenauer et al., 2015).

In the current study, the lecturer's academic support encompasses a range of assistance and guidance provided by instructors or lecturers to facilitate Economics students' academic success, learning, and engagement. This support may manifest in various forms, including but not limited to clarifying complex concepts during lectures, providing additional resources or references for further reading, offering constructive feedback on assignments and assessments, and being available for one-on-one consultations or academic advising sessions. Such support is instrumental in helping students navigate the intricacies of Economics coursework, develop a deeper understanding of key theories and principles, and enhance their critical thinking and problem-solving skills. Moreover, the lecturer's academic support is crucial in fostering a positive and supportive learning environment where students feel valued, motivated, and empowered to actively engage with the subject matter and pursue academic excellence in Economics.

Empirical Review

This segment of the chapter focuses on empirical studies that are related to the current study. In this section, the review is organised under the various research questions and hypotheses formulated to guide the study. These are studies on motivational orientations, self-regulated learning, academic engagement, differences in self-regulated learning based on gender and academic level, differences in academic engagement based on gender and academic level, the influence of motivational orientations on self-regulated learning, the influence of self-regulated learning on academic engagement, moderating roles of gender and lecturer academic support in the relationship between self-regulated learning and academic engagement.

Students' Level of Motivational Orientations

Diseth et al. (2020) assessed the construct validity of the Norwegian adaptation of a scale designed to measure both intrinsic and extrinsic motivation. Additionally, the study explored mean-level distinctions in intrinsic and extrinsic motivation across three different grade levels: 8th and 10th grades of lower secondary school and 1st grade of upper secondary school. Finally, the study probed the correlation between students' perceived academic achievement and their intrinsic and extrinsic motivation levels. Through factor analysis conducted on the entire sample ($N = 3203$), a one-factor solution for intrinsic motivation and a three-factor solution for extrinsic motivation were validated. Notably, students across all grades exhibited a significantly higher mean level of extrinsic motivation than intrinsic motivation. The research identified noteworthy differences in the mean levels of intrinsic motivation and the subscales of extrinsic motivation across various grade levels. Furthermore, students' perceived academic performance demonstrated a positive correlation with intrinsic motivation and the subscales of extrinsic motivation.

Khan et al. (2022) conducted a comparative investigation into the motivational orientations of university students concerning learning the English language. Data collection and analysis were performed using quantitative methods. The study sample consisted of 500 students randomly selected from 12 undergraduate programmes across four universities. Twenty (20) students were chosen from each programme at the three universities within this sample. The researcher designed a questionnaire containing 16 items representing students' integrative (4 items), instrumental (6 items), resultative (3 items), and intrinsic orientations of motivation (3 items). The collected data were organised and examined based on the frequency of responses to each questionnaire. Mean scores, standard deviation, standard error of the mean, and ANOVA were used for comparison. The findings indicated high levels of students' integrative, instrumental, resultative, and intrinsic motivational orientations toward learning English, reflecting their increased inclination to learn English at the university level.

Nurhasnah, Lufri, Andromed, and Mufit (2022) investigated students' confidence in learning science, focusing on their self-efficacy. Students were expected to possess self-potential and cultivate a sense of assurance in accomplishing learning objectives. The survey research was conducted among 30 ninth-grade students at SMPN in Padang City. Data were gathered through a questionnaire comprising 15 questions based on self-efficacy indicators. The data analysis revealed that the self-efficacy level among ninth-grade students at SMPN in Padang City was 70.94, categorised as high. This indicates active collaboration between teachers and students in fostering success in the science learning process.

Mahmud, Akmal and Arias (2023) examined the predominant motivational orientation and the level of motivation among students from Gayo, focusing on their enthusiasm for studying English at the Department of English Language Education, Universitas Islam Negeri Ar-Raniry in Banda Aceh. The study included 33 students from batch 2014 to batch 2018 in the Department of English Language Education, representing the Gayo Highland districts (Central Aceh, Gayo Lues, and Bener Meriah Districts). The study employed a random sampling technique, utilising close-ended questionnaires as the data collection tool. Results indicated that the overall score for intrinsic motivation surpassed that of extrinsic motivation (4.21 > 3.05). Consequently, this study suggested the need for educators to enhance students' extrinsic motivation, aiming to elevate their academic performance in English studies at the university level.

Hameed, Channa, Khan, Khan, Rana, Gayantri, Arif and Timmer (2023) studied the extent of test anxiety and its relationship with the academic performance of undergraduate students. This cross-sectional analytical study was conducted from September 1st to December 15, 2022, using a purposive sampling technique to collect data from undergraduate students at Sohail University in Karachi. The Westside Test Anxiety Scale questionnaire was used, and data analysis was performed using SPSS version 22.0. The analysis involved descriptive statistics, the Mann-Whitney U test, and Spearman’s correlations. The results revealed that 44% of the participants were male, 94% were single, 50% were nursing students, and 57.5% were in their 1st and 2nd years of undergraduate studies. The majority of the respondents (70.5%)

experienced high to extremely high levels of test anxiety, while 17.5% had a mild to moderate level of anxiety.

A significant association was observed between test anxiety and the study program ($p = 0.021$). A weak reciprocal correlation coefficient was also identified between academic performance and test anxiety ($r = -.473$). The study's findings indicated that 88% of undergraduates exhibited high to extremely high levels of test anxiety. Furthermore, a significant link was established between the study programme and anxiety levels, along with a significant correlation between academic performance and test anxiety.

Students’ Level of Self-Regulated Learning

Mahama, Dramanu, Eshun, Nandzo, Baidoo-Anu, and Amponsah (2022) investigated the influence of personality traits on the self-regulated learning and academic engagement of college education students. Employing a quantitative approach, the study used a questionnaire for data collection and conducted descriptive and inferential statistical analyses. The research followed an analytical cross-sectional design, drawing a sample of 652 participants (87.0% return rate) from an accessible population of 17,396. The data collection instruments included adapted versions of the Taiwanese Short Self-Regulation Questionnaire, the University Student Engagement Inventory, and Big-Five Personality Inventory. Multivariate multiple regression was employed for data analysis. Results indicated that college education students demonstrated lower levels of self-regulated learning and academic engagement. Specifically, the study highlighted that a significant portion of students exhibited low academic engagement ($n = 210$, 37.0%), while others demonstrated high academic engagement ($n = 189$, 30.4%), with a smaller group showing a moderate level of academic engagement (n = 169, 29.8%). It is noteworthy that Mahama et al.'s investigation specifically focused on college of education students, distinguishing it from the scope of the current study.

Brahma and Saikia (2023) analysed the impact of self-regulated learning on academic procrastination among college students. This study was a descriptive, questionnaire-based survey conducted at the Kamrup (M) College of Assam, affiliated with Gauhati University. The sample consisted of 142 college students (both boys and girls). Data were collected both offline and online, and SPSS was used to perform statistical tests. Z-score, percentage, chi-square, correlation, and regression analyses were performed to test the null hypotheses and determine the objectives. The results showed that all college students fell under an extremely high level of self-regulated learning to the average level of self-regulated learning, indicating that they were self-regulated learners.

Chen, Lin, Chen and Fu (2023) delved into the concealed patterns of self-regulated learning (SRL) techniques, encompassing cognitive, metacognitive, and motivational regulation, as adopted by Chinese learners of English as a foreign language (EFL) within a context of high-stakes testing. Additionally, the study examined the correlations between these strategies and individual factors such as gender, grade, reading proficiency, and motivational beliefs. Employing a sequential explanatory mixed-methods approach, 1,113 students in grades 11 and 12 underwent a reading comprehension test and responded to a questionnaire regarding their utilisation of strategies and individual characteristics. Sixteen participants were randomly chosen for subsequent semi-structured interviews. The results disclosed three distinct SRL profiles, delineated by varying degrees of SRL strategy engagement: high, medium, and low.

Students' Level of Academic Engagement

In Malaysia, Ayub, Yunus, Mahmud, Salim and Sulaiman (2017) examined secondary school students' mathematics engagement level. This research employed a descriptive survey design. Data collection from the secondary school students was conducted in Pahang. The schools were randomly selected for this study. Among them were cluster secondary schools, national religious secondary schools, daily national secondary schools, island secondary schools. A total of 55 items were utilised and adopted from Kong, Wong and Lam (2003). A total of 387 students (186 male and 201 female) from the urban and rural secondary schools in Pahang, Malaysia, were randomly selected. There were 158 students from the urban schools and 229 students from the rural schools. Descriptive analyses for mathematics engagement domains revealed behavioural engagement had the highest mean (M = 3.74, SD = .63), followed by cognitive engagement (M = 3.56, SD = .43) and affective engagement (M = 3.48, SD = .47). The mean for students' overall mathematics engagement was 3.56 (SD = .46). The overall mean indicated students had a moderate mathematics engagement (M = 3.56, SD = .46).

Torto (2020) explored the nature of student engagement within English classrooms in basic public schools in Ghana. Employing a quantitative research approach, the investigation involved 61 English language teachers in the Cape Coast metropolis. Data was collected through a Likert Scale questionnaire with five points, and the subsequent analysis employed descriptive statistics, specifically means and standard deviation. The study's findings indicated that among the three dimensions of student engagement, the emotional dimension emerged as the predominant aspect.

Estévez, Rodríguez-Llorente, Piñeiro, González-Suárez and Valle (2021) examined school engagement, academic achievement and self-regulated learning. This study used latent profile analysis (LPA) with a sample of 717 5th and 6th year primary school students. The analysis revealed two distinct groups of low-engaged students: one with low behavioural engagement (5.02%) and the other with low emotional engagement. Most participants (31.95%) had moderately high levels of engagement, while 56.48% had moderate levels across the three dimensions of school engagement. Students with high levels of engagement achieved better grades managed their time and study environments more effectively and were more strategic in seeking information. They also exhibited less maladaptive regulatory behaviour. The differences between students with low behavioural and emotional engagement and those with moderate levels of engagement may be related to the management of contextual resources and information-seeking behaviours. This study underscores the importance of considering the combined dimensions of emotional, behavioural, and cognitive engagement in studying school engagement.

In a different study, Bayoumy and Alsayed (2021) explored the connection between learning engagement, motivation, and academic performance among university nursing students. The researchers used a descriptive design with a comparative correlational approach to analyse the data, which described and compared the study outcomes. Data were collected from 425 students attending the King Saud bin Abdulaziz University for Health Sciences campuses in Riyadh, Jeddah, and Alhasa. A questionnaire was used to collect data, and academic achievement was considered as measured by cumulative and last semester grade-point averages. This study found moderate levels of engagement among the students.

Effah and Nkwantabisa (2022) investigated the academic engagement levels of university accounting students in Ghana and explored the relationship between academic engagement (Vigour, Dedication, and Absorption) and academic performance, as measured by students' perceived academic performance and Grade Point Average (GPA). Using a quantitative research approach and questionnaires as the primary research instrument, data were collected from 215 university students and analysed using a hierarchical regression technique. The results showed that accounting students scored higher in Dedication than in Vigor and Absorption in terms of academic engagement. Furthermore, the analysis revealed that older accounting students performed better academically than their younger counterparts. Moreover, academic engagement affected students' academic performance with a stronger emphasis on their dedication to accounting.

In Ghana, Mahama et al. (2022) explored personality traits as predictors of self-regulated learning and academic engagement among college students. This study employed a quantitative approach to data collection using a questionnaire. The data analysis was performed using descriptive and inferential statistics. This study adopted an analytical, cross-sectional design. A sample of 652 students was drawn from an accessible population of 17,396.

Adapted versions of the Taiwanese Short Self-Regulation Questionnaire, University Student Engagement Inventory, and Big Five Personality Inventory were used for data collection. The collected data were analysed using multivariate multiple regression analysis. The study revealed that college students exhibited lower self-regulated learning and academic engagement levels.

Specifically, the study discovered that the majority of students had a low level of academic engagement (n = 210, 37.0%), while some possessed a high level of academic engagement (n = 189, 30.4%), and a few had a moderate level of academic engagement (n = 169, 29.8%). This study focused on the college of education students, which is different from the current study's.

Additionally, with specific emphasis on cognitive engagement, Yidana and Arthur (2022) investigated the extent of academic cognitive engagement among Economics students using a descriptive cross-sectional survey design. Data were collected from 422 Senior High School Economics students utilising the Academic Cognitive Engagement Scale (ACES). Data analysis involved descriptive statistics (frequencies, percentages, mean, and standard deviation) and inferential statistics (One-Way MANOVA). The findings revealed a high level of academic cognitive engagement among economics students, with 59.7% of the participants demonstrating a high level of engagement. Despite the study's focus solely on the cognitive dimension of academic engagement, the authors acknowledged the potential for a more comprehensive understanding by incorporating cognitive, emotional and agentic engagement dimensions in future research.

Difference in Economics Students' Self-Regulated Learning based on Gender and Academic Level

Stanikzai (2020) examined the extent of self-regulated learning and gender differences among English as a Foreign Language university students in Afghanistan. The sample comprised 180 students (105 males and 75 females) from four different public universities in Afghanistan. A questionnaire with 48 items assessing the self-regulated learning of university students was administered. The study's findings revealed that the majority of university students fell into the category of having a high level of self-regulated learning. Importantly, no significant difference was identified between male and female university students in Afghanistan concerning their self-regulated learning.

Appiah-Kubi, Amponsah, Nti-Adarkwah and Asoma (2022) studied the influence of gender on self-regulated learning on students' academic engagement in Ghana. Descriptive cross-sectional survey design was utilised for the study. Stratified and systematic sampling techniques were employed to select a sample of 315 senior high school students in the Berekum Municipal in the Bono Region of Ghana for the study. The study adapted questionnaires on self-regulated learning and students' engagement to collect data from the students. Data were analysed descriptively (frequencies, means, and standard deviations) and inferentially (regression, MANOVA, and Hayes Process). The study revealed that students were moderately self-regulated and moderately academically engaged. Again, male students were found to have more self-regulated learning capacities than their female counterparts. However, no significant difference was found in students' academic engagement based on gender.

Noviani, Istiqomah, Wibowo and Sabandi (2023) explored the potential moderating influence of gender on the relationship between self-regulated learning, self-efficacy, and learning motivation and their impact on academic achievement in economics. The study used a quantitative correlational approach, focusing on social studies students in Boyolali, with a total population of 1,284 students. The study employed a cluster random sampling, the research included a sample size of 308 students. Data collection was conducted through a questionnaire, and the analysis involved moderated regression analysis.

The study's findings revealed that the t-count for the self-regulated learning variable was 1.385, falling below the critical value of 1.656, and the significance value of 0.167 exceeded 0.05. Regarding the self-efficacy variable, the t-count was 1.929, surpassing the critical value of 1.656, but the significance level of 0.055 was higher than 0.05. For the learning motivation variable, the t-count was 2.122, exceeding the critical value of 1.656, and the significance value of 0.035 was below 0.05. The study indicated no significant difference in self-regulated learning between male and female students. While gender showed a positive influence on self-efficacy, this effect was not statistically significant. However, gender had a positive and statistically significant impact on learning motivation.

Anazifa et al. (2023) investigated self-regulated learning among undergraduate students. Descriptive survey design was employed for the study. A total of 124 students participated, responding to 24 online questions that encompassed six subscales: goal setting, environment structuring, task strategies, time management, help-seeking, and self-evaluation. Descriptive analysis was employed to compare mean averages in gender and disciplinary differences. Independent sample T-tests were employed to analyse the relationship between students' self-regulated learning and gender, as well as the relationship between self-regulated learning and study programs. Additionally, correlation analysis was conducted to explore the connection between students' self-regulated learning and their academic achievement. The results indicated no significant differences in self-regulated learning based on gender.

Difference in Economics Students' Academic Engagement based on Gender and Academic Level

Students' academic engagement is significantly influenced by contextual and domain-specific factors (Sinatra, Heddy, & Lombardi, 2015). Although academic engagement has received considerable attention in the fields of education and psychology, limited foreign language research has addressed this critical learning construct as well as the underlying mechanisms through which it is impacted by other factors. Yu, Zhou, Zheng, Cao, and Li (2019) explored Chinese undergraduate students' motivation and engagement in English as a Foreign Language (EFL) writing classes. The study revealed that students were highly motivated and engaged in EFL writing, and individual differences, such as gender, grade, and the prestige of their college, affected their motivation and engagement. According to Canchola González and Glasserman-Morales (2020), the level of academic engagement among students may be influenced by certain profile characteristics, including their gender and academic level.

Lietaert, Roorda, Laevers, Verschueren, and De Fraine (2015) scrutinised differences in behavioural engagement between male and female students in Dutch language classes. The study involved 385 Grade 7 students and 15 language teachers. The methodology included assessing teacher support through student reports and measuring student engagement through reports from students, teachers, and observers. Structural equation modelling was used to test the mediating role of teacher-support dimensions in explaining gender-related differences in behavioural engagement.

Moreover, a multi-group analysis was employed to examine the potential divergent effects of teacher support dimensions on boys' and girls' engagement. The results indicated that boys demonstrated lower engagement levels than girls, and reported receiving less support from their teachers. Autonomy support and involvement were identified as partial mediators of the relationship between gender and behavioral engagement. Autonomy support emerged as a protective factor for boys' engagement, but not for girls, while structure and involvement equally contributed to engagement for both genders.

King (2016) investigated gender variations in students' motivation, engagement, and achievement. The study included participants (n = 848) from two public secondary schools in the Philippines. The findings revealed that boys exhibited a less favourable academic profile in terms of motivation, engagement, and achievement. Path analyses demonstrated that these gender-related distinctions were linked to peer attitudes toward school. Specifically, boys perceived their friends as having more negative attitudes toward school, and these perceptions were connected to lower levels of motivation, engagement, and achievement. Notably, there were no significant gender differences in the perceived parental and teacher support. Importantly, there were no discernible gender differences in engagement.

Hartono et al. (2019) conducted an evaluation of student engagement in high school history classes in Jember, taking into account gender and grade distinctions. The study encompassed 354 Social Sciences majors from classes X, XI, and XII in five State Senior High Schools in Jember. Data analysis employed two-way Multivariate Analysis of Variance (MANOVA). The findings indicated a noteworthy difference in student engagement levels based on both gender (p-value < 0.05) and grade (p-value < 0.05). Notably, the mean score of female students' engagement (3.66) exceeded that of male students (3.46). Furthermore, student engagement scores in grade X (3.71) were higher compared to those in grade XI (3.53) and grade XII (3.43). These findings suggest that students’ engagement is dependent on their demographic characteristics such as gender and grade (academic level).

Ganiyu (2021) examined College of Education Science students’ engagement in emergency rote teaching (ERT) in Nigeria. This descriptive survey aimed to investigate the affective, behavioural, cognitive, and overall engagement levels of pre-service science teachers in Colleges of Education in Kwara State, Nigeria, participating in online ERT classes. Purposive and snowball sampling methods were employed to select six Colleges of Education, with 241 students taking part in the study. The online questionnaire's reliability coefficient for data collection was 0.81. Mean and independent t-test analyses were utilised to interpret the gathered data. Results revealed a high general level of student engagement, and a notable gender difference was observed in behavioural engagement levels ($X2(2) = 7.561$, $p = 0.023 < .05$), favoring male students. The study concluded that students in Colleges of Education demonstrated high levels of affective, behavioural, cognitive, and overall engagement in ERT.

Amoah et al. (2021) studied the correlation between students' involvement and their academic performance, focusing on College of Education students in Ghana. A descriptive survey approach was employed for the study, utilising multi-stage sampling techniques, including proportionate and simple random sampling. A total of 310 students, consisting of 187 males and 123 females, were selected from five Colleges of Education to partake in the research. Data collection used standardised tools, and analysis encompassed descriptive statistics (e.g., mean, standard deviation) along with inferential methods such as multiple regression and independent sample t-tests.

Results indicated that self-reported behavioural, emotional, and cognitive engagement did not serve as predictors for the academic achievement of College of Education students. Furthermore, the amalgamation of various facets of student engagement did not forecast academic success either. Additionally, findings revealed no significant gender disparity in the engagement levels among College of Education students.

Zhao et al. (2023) investigated the impact of gender, major, and age variations on student engagement in a blended learning environment. The research employed SPSS 26 to perform independent t-test and one-way ANOVA analyses to discern the effects of gender, age, and major on student engagement. The superstar platform was utilised to establish a blended learning environment, widely adopted in Chinese higher education.

The findings showed that there was no statistically significant difference in behavioural engagement between male and female students. Male students exhibited higher average levels of cognitive engagement and emotional engagement compared to their female counterparts. Students majoring in liberal arts or science do not demonstrate significant differences in behavioural engagement, cognitive engagement, and emotional engagement. Interestingly, students of varying ages display a significant difference in emotional engagement, while no significant differences are observed in behavioural or cognitive engagement.

Influence of Students' Motivational Orientations on their Self-Regulated Learning

Sen and Yilmaz (2016) examined the correlation between time and study environment management, effort regulation, self-efficacy beliefs, control of learning beliefs, and metacognitive self-regulation among preservice teachers. Additionally, the study explores both the direct and indirect impact of metacognitive self-regulation on time and study environment management. Utilizing data from 506 preservice teachers collected through the Motivated Strategies for Learning Questionnaire (MSLQ), the findings revealed a positive and significant correlation between control of learning beliefs and metacognitive self-regulation, self-efficacy beliefs and metacognitive self-regulation, metacognitive self-regulation and time and study environment management, time and study environment management and effort regulation, as well as metacognitive self-regulation and effort regulation. Beyond the direct influence of metacognitive self-regulation on time and study environment management, there is an additional indirect effect through effort regulation.

Tosuncuoglu (2019) investigated learners in higher education in a Turkish context, in terms of motivational components such as goal orientation, self-efficacy, intrinsic value, test anxiety and self-regulated learning components such as cognitive strategy usage and self-regulation. The study was carried out with 233 higher-education students enrolled in the English Language and Literature department. Descriptive, variance and correlation analyses were carried out to answer the research questions. The results showed that the participants were reported to have satisfactory level of goal orientation, self-efficacy, intrinsic value, test anxiety, cognitive strategy usage and self-regulation. ANOVA results indicated that there were statistically significant differences between the three types of students, regular (daytime), evening, and distance education, with regard to goal orientation and self-efficacy. Furthermore, correlation analysis suggested that there was a moderate level of correlation between self-regulation and cognitive strategy usage.

Abdulhay, Ahmadian, Yazdani and Amerian (2020) explored the connection between goal orientations (specifically, mastery-approach, mastery-avoidance, performance-approach, and performance-avoidance goals) and the self-regulation of writing in Iranian university EFL learners. A survey instrument was employed, administered to a sample of 116 second-year students enrolled in essay writing courses. Pearson product-moment correlation and regression techniques were applied for the data analysis. The most robust correlation was identified between the personal performance approach and performance avoidance goals. Personal mastery and performance goals as well as mastery goal structure were significantly and positively associated with self-regulation in writing. Efficacy exhibited a significant relationship with goal-orientation measures. Goal orientation plays a role in predicting self-regulation of writing. Additionally, the study found that performance-approach goal structure positively predicted writing achievement. In summary, these findings suggest that comprehending the nature of goal orientations facilitates the alignment of writing self-regulation and achievement.

Lim and Yeo (2021) conducted a systematic review to identify the motivational factors most closely associated with self-regulated learning, and to also explore the nature of these associations. The review included 20 studies with a total sample size of 8,759 participants who met the inclusion criteria. The collective evidence from the reviewed studies consistently demonstrated positive and significant relationships between motivational constructs, such as self-efficacy, intrinsic goal orientation, task value, and control of learning beliefs, and self-regulated learning. Test anxiety exhibited a negative and insignificant relationship with, and prediction of, self-regulated learning. In contrast, findings regarding extrinsic goal orientation were inconsistent, showing both positive and negative associations with and predictions of self-regulated learning.

Lee, Watson and Watson (2020) examined the relationships between self-efficacy, task value, and the use of self-regulated learning strategies by massive open online course (MOOC) learners from a social cognitive perspective. A total of 184 participants who enrolled in two MOOCs completed surveys. The results of Pearson's correlation analysis show a positive correlation between self-efficacy and the use of self-regulated learning strategies, as well as a positive correlation between task value and the use of self-regulated learning strategies. The results of hierarchical multiple regression analysis showed that self-efficacy and task value are significant predictors of the use of self-regulated learning strategies. There was a statistically significant difference in the use of self-regulated learning strategies between learners who possessed high self-efficacy and those who possessed low self-efficacy. In addition, learners who had high task value showed statistically significant higher average self-regulated learning scores than those who had low task value.

Fitriastuti, Mustami'ah and Arya (2021) determined the relationship between self-efficacy and goal orientation with self-regulated learning. This study used a quantitative approach with a correlational type. Respondents were students of the Faculty of Psychology, Hang Tuah University, Surabaya class of 2019. Respondents totalled 75 students, selected using a saturated sampling technique. This study uses a self-regulated learning scale, a self-efficacy scale, and a goal orientation scale. The results of the study indicated that self-efficacy and goal orientation had a significant positive relationship with self-regulated learning, with an effective variable contribution of 58.4%.

Nisa, Ul Islam and Laraib (2022) investigated the effect of learners' interest and goal orientation on their practice of self-regulated learning strategies in English Subject. The model of this paper consisted of interest (feeling-related and value-related valence beliefs), goal orientation (performance and mastery goal orientation), and SRL strategies (cognitive and metacognitive strategies). Seven hundred and thirty-one (731) English undergraduates participated in this paper. All the participants were assessed on goal orientation using Goal Orientation Questionnaire, interest using the Interest Questionnaire, and practice of self-regulated learning strategies using the Questionnaire about SRL Strategies. Pearson correlation and Multiple Regression were used to analyse the data.

The findings revealed that learners' interest and goal orientation positively correlated to their practice of self-regulated learning strategies. Mastery goal orientation was the independent predictor of learners' practice of cognitive and metacognitive strategies. A value-related valence belief was the independent predictor of learners' practice of cognitive strategies. In contrast, a feeling-related valence belief was an independent predictor of learners' practice of meta-cognitive strategies. Similarly, Baars et al. (2017) found that motivation is a positive personal influencing factor affecting self-regulated learning.

El-Adl and Alkharusi (2020) studied the connections between self-regulated learning strategies, students' learning motivation, and academic achievement in mathematics. The study adopted a descriptive research design and involved 238 ninth-grade students in the Sultanate of Oman. The assessment of participants' use of self-regulated learning strategies and motivation was conducted using the Motivated Strategies for Learning Questionnaire. Academic achievement was gauged through the total score attained in mathematics. The findings unveiled statistically significant positive associations between self-regulated learning and intrinsic motivation, extrinsic motivation, task value, control of learning beliefs, self-efficacy, and academic achievement. Additionally, test anxiety exhibited a negative correlation with self-regulated learning.

A recent study by Hayat et al. (2020) investigated how medical students' confidence in their academic abilities (self-efficacy), their emotions about learning (learning-related emotions) and their strategic learning approaches (metacognitive learning strategies) influence their academic performance. The study involved 279 medical students at Shiraz University of Medical Sciences. They completed questionnaires on each of these factors. Statistical analysis showed that students' self-efficacy influenced both their feelings about learning and the strategies they used to learn. Furthermore, these emotions and strategies in turn influenced their academic performance. Interestingly, the study also showed that positive emotions about learning played a mediating role, that is, they helped to explain the relationship between self-efficacy and academic performance.

Influence of Students' Self-Regulated Learning on their Academic Engagement

Setiani and Wijaya (2020) investigated the relationship between self-regulated learning and student engagement in the context of college students' management of multiple roles. The study adopted a descriptive survey design involving 206 college students from X University, 114 males and 92 females. The measuring tools used included a self-regulated learning instrument and student course engagement quotient. Using the Pearson correlation technique, the analysis revealed a positive and statistically significant correlation between self-regulated learning and student engagement ($r = 0.262$, $p = 0.000 < 0.05$).

Gaxiola-Romero, Gaxiola-Villa, Corral-Frías, and Escobedo-Hernández (2020) explored the relationship among Positive Learning Environments (POLE), academic engagement, and self-regulated learning among high school students. Using a cross-sectional design, 166 first-year high school students participated, consisting of 76 males (45.8%) and 90 females (54.2%), with an average age of 15.2 (S.D. = .43). Prior to their involvement, parental consent and participant assent were obtained. Students completed a questionnaire assessing parental academic support, pro-academic friends, positive family environment, academic engagement, and self-regulated learning. Structural equation modelling demonstrated a significant correlation ($p < .05$), with POLE acting as a latent factor influenced by parental academic support, pro-academic friends, and a positive family environment. The structural model indicated a positive link between POLE and academic engagement (structural coefficient = .80). Additionally, academic engagement was correlated with self-regulated learning (structural coefficient = .55), accounting for 30% of students' SRL. These results indicate that fostering a positive learning environment can boost academic engagement and contribute to the cultivation of self-regulated learning skills among students.

Utami and Aslamawati (2021) investigated the impact of self-regulated learning on the engagement of accounting students. The underlying hypothesis posited a significant effect of self-regulated learning on the engagement of accounting students in Bandung. Employing a non-experimental causality research method, the study involved 360 Accounting students in Bandung, selected through proportional stratification sampling. The self-regulated learning test, utilising the short version of the Motivated Strategies for Learning Questionnaire (MSLQ), served as the measuring tool. Student engagement was gauged using the University Student Engagement Inventory (USEI), adapted from Maroco, Maroco, Campos, and Fredricks (2016). The data analysis yielded significant values of 0.000, supporting the research hypothesis. The findings indicated that self-regulated learning contributed to student engagement by 52.8%, with a significance level of 0.05.

Helsa and Lidiawati (2021) examined the extent of students' participation in the distance learning process during the pandemic, focusing on their capacity for self-regulation in learning. The study encompassed 521 participants; active students engaged in distance learning during the COVID-19 pandemic, comprising 161 males and 360 females aged between 18 and 21 years. The findings revealed a substantial correlation between self-regulated learning and student engagement ($r = .748$, $p = 0.000$). The results of the linear regression test were also significant (F (df1, df2) = 659.20, $p = .000$). The coefficient of determination indicated that self-regulated learning exerted a 55.9% influence on student engagement. In summary, this study highlighted the significant impact of self-regulated learning on student engagement.

Dewi and Hadiana (2021) investigated the dimensions of school engagement and the influence of self-regulated learning (SRL) on school engagement. The participants were 232 students from public high schools in Jakarta. To comply with physical distancing policies, the respondents completed two scales through a G-form: the school engagement measures and the online self-regulated learning questionnaire. Confirmatory factor analysis was employed to validate the instruments and regression analysis was used to assess the impact of SRL on school engagement. The results indicated that 57% of students exhibited low emotional engagement, 54% demonstrated low behavioural engagement, and 63% displayed low cognitive engagement in their school activities. Moreover, the findings highlighted that students' proficiency in regulating their goals and managing their time significantly influenced their school engagement.

Stan, Topală, Necşoi, and Cazan (2022) conducted an examination into the predictive value of individual traits, such as online self-efficacy and adaptability to uncertainty, as well as stress sources, on learning engagement during online learning. The research employed a descriptive survey design and involved 529 university students in a cross-sectional study. Findings indicated significant correlations between sources of stress in online learning and self-efficacy, learning engagement, and self-regulated learning strategies. Notably, self-regulated strategies, particularly task strategies and goal setting, acted as mediators for stressors perceived by students amidst the sudden transition to online activities and learning engagement. Goal setting and task strategies emerged as the most pertinent self-regulation techniques, highlighting the necessity for a well-defined learning structure in online activities.

Azhari, Fadjarajani, and Rosali (2023) examined the correlation among self-regulated learning, family support, and learning motivation in relation to students' learning engagement. One hundred 12th-grade students from a senior high school completed a questionnaire. Structural equation modelling using partial least squares (SEM-PLS) was employed to analyze the intricate relationships among these variables. Reflective analysis of the variables was applied to statistically investigate the connections between them. The observed

P-values between variables indicated significant relationships, specifically FS -> LM (0.006), LM -> LE (0.000), SRL -> LE (0.006), and SRL -> LM (0.000).

In Canada, Wu, Cieslik, Askari, Hadwin and Hood (2023) evaluated the psychometric properties of the self-regulated learning profile and self-diagnostic (SRL-PSD) instrument, specifically examining various components of self-regulated learning (SRL) and academic challenges faced by adolescents. The study involved 358 participants from a Canadian middle school. Administered through the LimeSurvey during a 25-minute instructional session spread over two days, the SRL-PSD subscales were used to assess students. The results indicated that the SRL-PSD was a reliable and valid self-report instrument for measuring adolescents' SRL practices and academic challenges. Furthermore, all types of SRL practices and academic challenges exhibited significant inter-correlations. Notably, all forms of SRL practices showed positive associations with school engagement, whereas all types of academic challenges were negatively associated with school engagement.

Liao, Zhang, Yang, and Fei (2023) investigated the interconnections among regulated learning, teaching presence, and student engagement within the context of blended learning in China. They formulated a two-level model encompassing contextual (teaching presence) and individual (regulated learning) factors. Employing the experience sampling method, this study gathered intensive longitudinal data from 139 participants across three universities during a 13-week blended course. Multilevel regression analysis was then conducted to scrutinise the impact of teaching presence, self-regulated learning (SRL), and co-regulated learning (CoRL) on both intra- and inter-individual variance in student engagement.

The study revealed that perceived teacher support and instructional design fit significantly and positively influence cognitive and emotional engagement, serving as crucial contextual factors shaping intra-individual variance in learning engagement. SRL and CoRL emerged as co-predictors of student engagement in blended learning, with CoRL showing a stronger association with emotional engagement, and SRL with cognitive engagement. Modality had a significant impact on cognitive engagement, but not on emotional engagement. SRL and CoRL positively moderated the relationship between perceived teaching presence and cognitive engagement, whereas they negatively moderated the relationship between teacher support and emotional engagement. In other words, the connection between teacher support and emotional engagement was more pronounced in situations characterised by low SRL or CoRL.

Zare, Delavar, Derakhshan, and Pawlak (2024) conducted a study utilising an explanatory sequential mixed-methods design to investigate the potential connection between the application of self-regulated learning (SRL) strategies and task engagement. The research involved 361 Iranian EFL students pursuing B.A. degrees in English language teaching or English language and literature, possessing a B1 English language proficiency level per the Common European Framework of Reference for Languages. Data collection was conducted remotely during the COVID-19 pandemic through questionnaire surveys, narrative frames, and semi-structured interviews. Quantitative data analysis indicated a significant predictive relationship between SRL strategy use and task engagement. Qualitative analysis further highlighted the crucial role of various SRL strategies, including (meta) cognitive, (meta)affective, (meta)motivational, and (meta)social strategies, in sustaining task engagement.

Moderating Role of Gender in the Relationship between Students' Self-Regulated Learning and Academic Engagement

Numerous investigations have explored gender disparities in self-regulated learning (SRL) across various components. Zimmerman and Martinez-Pons (1990) observed in an early study that girls exhibited a notably higher inclination than boys to utilise self-monitoring, goal setting, planning, and structuring strategies in their study habits. Bidjerano's (2005) review study further highlighted that female students, compared to males, demonstrated superior proficiency in employing self-regulated strategies such as information organisation, metacognition, time management, elaboration, and effort.

Conversely, Hargittai and Shafer (2006) discovered that females tended to evaluate their own skills lower than males, while Basol and Balgalmis (2016) reported higher average self-regulation scores among female participants, particularly in the areas of "planning and determining aims" and "lack of self-direction." The literature presents conflicting findings regarding gender-related differences in the constituent elements of SRL (Martinez-Lopez et al. 2017; Stanikzai, 2020), reflecting the varying conclusions of the different studies.

In an educational setting, numerous students encounter challenges in effectively regulating their learning. Despite their efforts, these strategies may prove unproductive, lack adaptability to specific learning tasks or situations, or fail to foster deep-level learning processes (Perry, Phillips & Dowler, 2004; Pintrich, 2004; Winne, 2005). However, studies have suggested that individual background characteristics contribute to variations in self-regulated learning (SRL). Notably, gender differences emerge, with boys displaying less self-regulating behavior than girls (Pajares, 2002; Vandevelde, Van Keer & Rosseel, 2013). Analyses of gender disparities in students' SRL profiles revealed that girls tend to report more favourable SRL profiles than boys (Heirweg, De Smul, Devos & Van Keer, 2019). Furthermore, in massive open online courses (MOOCs), female students are reported to adopt more goal-setting and environment-structuring strategies than their male counterparts (Li, 2019).

The shift to online learning during the COVID-19 lockdown necessitating a more person-oriented approach (Alghamdi, 2021) underscores the importance of understanding how gender influences individuals' application of Self-Regulated Online Learning (SROL) components. Despite this, limited research has explored gender differences in the context of SROL during the COVID-19 pandemic. To address this gap, this study adopts an SROL approach and examines gender profiles among high school students across the three phases of SROL during the COVID-19 lockdown. This study posits three hypotheses to explore gender differences in this context.

Several studies (e.g., Appiah-Kubi et al., 2022; Heirweg et al., 2019; Li et al., 2019) appraised indicated that there are gender variations in self-regulated learning and academic engagement. The preceding studies imply that gender might have an influence on the nexus between self-regulated learning and academic engagement. Therefore, the current study determines the moderating role of gender in the relationship between self-regulated learning and academic engagement.

Moderating Role of Lecturer Academic Support on the Relationship between Self-regulated Learning and Academic Engagement

Liu, Zhen, Ding, Liu, Wang, Jiang and Xu (2018) assessed 869 elementary school students in China using self-report questionnaires, to examine the multiple mediating effects of academic self-efficacy and positive academic emotions (enjoyment and relief) in the relations between teacher support and academic engagement (cognitive, behavioural and emotional aspects) within a math class. The results indicated that teacher support exerted a direct and significant impact on the three aspects of math engagement. Both academic self-efficacy and enjoyment mediated the relations between teacher support and the three aspects of math engagement, whereas relief did not mediate such relations. Moreover, teacher support affected math engagement through multiple paths from academic self-efficacy to both enjoyment and relief. Relief displayed a smaller effect on the three aspects of math engagement than enjoyment did. However, we did not find substantial difference in the underlying mechanisms of different aspects of engagement.

Laxdal et al. (2020) investigated the relationship between teacher learning support, motivational climate and self-regulated learning in upper-secondary school physical education. Descriptive cross-sectional survey design was utilised for the study. A sample consisting of 554 upper secondary school students from Norway answered a survey pertaining to their everyday experiences in physical education. A multiple regression based structural equation model indicated that teacher learning support, ego-involving motivational climate and task-involving motivational climate were all significant positive predictors of self-regulated learning, with teacher learning support emerging as the most prominent predictor.

Azila-Gbettor and Abiemo (2021) explored the connections between academic self-efficacy, study engagement, and perceived lecturer support within the context of higher education. A group of 376 participants from a technical university in Ghana volunteered for the study and completed a questionnaire on their experiences. Data was analysed using descriptive statistics and a method called Partial Least Squares-Based Structural Equation Modelling (PLS-SEM). The findings indicated that both academic self-efficacy and perceived lecturer support significantly and positively influenced study engagement. Moreover, perceived lecturer support played a significant role as a moderator between academic self-efficacy and study engagement. This research stands out as one of the pioneering studies examining a model involving academic self-efficacy, study engagement, and perceived lecturer support within a technical university setting, particularly from the perspective of a developing country.

Sadoughi and Hejazi (2023) examined the effect of teacher support on engagement by considering the serial mediating roles of learning experience and motivated learning behaviour. Participants were 384 EFL learners chosen through multi-stage cluster sampling. The SEM results demonstrated that teacher support directly and positively predicted engagement. Additionally, teacher support affected engagement through the serial mediating roles of learning experience and motivated learning behaviour. Teachers can provide learners with substantial support and encouragement to enhance their learning experience, which could in turn considerably affect their motivated learning behaviour. Consequently, EFL learners who are motivated and willing to exert effort in learning and classroom activities would be more engaged in their learning process.

Bia and Gu (2022) investigated the factors affecting self-regulated learning (SRL) and their underlying mechanisms, aiming to enhance this skill among K-12 students. Their study aimed to explore how teacher autonomy support influences students' online SRL by examining the structural connections between teacher autonomy support, parental autonomy support, students' self-efficacy, and students' online SRL. Using structural equation modelling and effect analysis, they analysed data collected from 961 Chinese K-12 students who transitioned to full-time online learning at home during the COVID-19 pandemic. The results revealed that parental autonomy support and students' self-efficacy independently played significant mediating roles in the influence of teacher autonomy support on students' online SRL. Moreover, parental autonomy support and students' self-efficacy collectively mediated the impact of teacher autonomy support on students' online SRL in a chain-like manner.

Miao and Ma (2023) examined teacher autonomy support influence on online learning engagement. This study collected 492 Chinese university students' survey questionnaires and applied structural equation model to measure their teacher autonomy support, self-efficacy, self-regulated learning (SRL), and online learning engagement. This study adopted self-determination theory (SDT), systematically explored the relationship between teachers' autonomy support and student learning engagement from the perspective of online contexts, and examined the mediating effects of students' self-efficacy and self-regulated learning (SRL) in online contexts. The study found that teacher autonomy support had a significant effect on student engagement in online learning, and was mediated by self-efficacy. Teacher-directed support had a significant effect on student engagement in online learning mediated by SRL. Teacher-directed support had a significant impact on online learning with self-efficacy and SRL as the main mediating variables.

Empirical studies (e.g., Azila-Gbettor & Abiemo, 2021; Laxdal et al., 2020; Liu et al., 2018; Miao & Ma, 2023; Sadoughi & Hejazi, 2023) reviewed showed that teacher support influenced students' academic engagement and self-regulated learning. Also, other studies such as Setiani and Wijaya (2020), Gaxiola-Romero et al. (2020) and Azhari et al. (2023) have found a significant positive connection between self-regulated learning and academic engagement. Drawing on the studies reviewed, the current study posits that the extent to which self-regulated learning positively influences academic engagement is contingent on the presence of lecturer's academic support. Hence, it was hypothesised that: *Lecturer's academic support does not moderate the relationship between self-regulated learning and academic engagement*.

Moderating Role of Students' Academic Level on the Relationship between Motivational Orientations and Self-Regulated Learning

Empirical studies have revealed that as students' progresses, their motivational orientations tend to decrease (Kitsantas, Winsler & Huie, 2008). If the motivational orientations of students increase, it is likely that their self-regulated learning will also increase.

Velayutham, Aldridge, and Fraser (2012) explored how students' motivational beliefs in science learning, including learning goal orientation, task value, and self-efficacy, influence their self-regulation in the science classroom, with a particular focus on the moderating effect of gender. The research involved 719 boys and 641 girls from grades 8, 9, and 10 across five public schools in Perth, Western Australia. The findings, obtained through structural equation modelling analysis, revealed that all three motivational constructs significantly predicted students' self-regulation in science learning. Furthermore, in examining gender differences, it was found that the impact of task value on self-regulation was only statistically significant for boys. These results suggest potential opportunities for educators to design effective intervention strategies aimed at enhancing students' self-regulation in science learning. Key strategies could involve fostering students' motivational beliefs related to learning goal orientation and self-efficacy in science learning. Moreover, interventions tailored for boys should specifically aim to enhance their perception of the value of science tasks.

Although this study used SEM, the study did not assess the common method bias and predictive relevance of the structural model. Another limitation of this was that grade-level differences were not analysed. Velayutham et al. (2012) recommended that future studies should concentrate on the moderating role of grade level. Hence, in order to fill this gap, the current study examines the moderating role of academic level on the relationship between students' motivational orientations and self-regulated learning.

In Ghana, Anane (2020) investigated how student teachers' motivational orientations mediate the connection between their prior performance and academic achievement. This cross-sectional correlation study utilized a survey method to collect quantitative data. The researcher employed both Stratified and Systematic sampling techniques to select 500 student teachers. Results revealed that students highly rated extrinsic motivation, the value of task or course materials, and self-efficacy for learning as significant motivators. Independent sample t-test comparing first and second year students' reported motivational orientations indicated statistically significant differences in their use of extrinsic motivation, control of learning beliefs, and task value as learning strategies, with first-year students reporting higher means than second-year students. The findings collectively suggested that student teachers' motivational orientations played a significant mediating role between prior performance (entry aggregates) and academic achievement (GPA), accounting for approximately 16.7% of the variance in this relationship. Together, prior performance and student teachers' motivational orientations explained around 42% of the variation in academic achievement.

Additionally, the study found that, except for intrinsic motivation where second-year students reported a higher mean than first-year students (though not statistically significant), all other mean scores were lower for second-year students compared to first-year students. This observation suggests that students' motivational orientations undergo dynamic changes under classroom learning conditions (McCombs, 2009; van Dinther, Dochy & Segers, 2011; Zimmerman, 2009) and may decline as students progress through their academic journey, possibly due to the challenges of upper-level classes or more demanding courses (Kitsantas et al., 2008). Consequently, it was hypothesised that the levels of Economics students do not moderate the relationship between their motivational orientations and self-regulated learning.

Mediating Role of Students' Self-Regulated Learning in the Relationship between Motivational Orientations and Academic Engagment

The mediating role of self-regulated language learning in the relationship between student engagement dimensions and language learning motivation was investigated among Iranian EFL learners by Ghelichli, Seyyedrezaei, Barani, and Mazandarani (2021). Using convenience sampling, 146 young adult male learners from Iran Language Institute participated in the study and completed three questionnaires. Structural equation modelling was used for data analysis. The findings revealed that self-regulated language learning did not mediate the relationship between student engagement and language learning motivation. However, significant positive relationships were observed between self-regulated language learning and behavioural, cognitive and agentic engagement, while its association with emotional engagement was not statistically significant. Ghelichli et al. relied on a relatively small and homogeneous sample, which limits the generalisability of their findings. The use of convenience sampling further reduces the external validity of the study, as it may not accurately represent the broader population of Iranian EFL learners. A more diverse and larger sample could have strengthened the robustness and applicability of the study.

A study by Zhang, Guan, Ahmed, Jobe and Ahmed (2022) examined the relationship between undergraduate students' achievement goal orientation and their academic engagement, emphasising the mediating roles of perceived school climate and academic self-efficacy. A total of 571 Chinese undergraduate students were selected using convenience and self-report methods to examine the effects of mastery and performance avoidance goals on academic engagement, as well as the chain mediation of perceived school climate and academic self-efficacy. Results indicated that both mastery-approach and performance-avoidance goals positively and directly influenced academic engagement. Furthermore, each goal orientation indirectly predicted academic engagement through perceived school climate and academic self-efficacy, with a significant chain mediation effect observed for both pathways. However, the study overlooked the potential mediating role of self-regulated learning in explaining how motivational orientations influence academic engagement, which could have provided a more comprehensive understanding of students' learning processes.

In another study, Zhong, Wen, and Li (2023) examined the extent to which different achievement goal orientations influence academic engagement through learning strategies and academic self-efficacy, and whether these effects vary by grade level. A total of 1,429 high school students (647 males, 782 females) were selected using cluster sampling. Achievement goal orientations, learning strategies, academic self-efficacy and academic engagement were measured using standardised scales. Results indicated that mastery approach, achievement approach, and achievement avoidance indirectly predicted academic engagement through the chained mediation of learning strategies and academic self-efficacy. However, mastery avoidance had neither direct nor indirect predictive effects on academic engagement. The study also found consistency in path structures across grades, except for differences in how mastery approach predicted learning strategies and how mastery avoidance influenced learning strategies. The study's reliance on cluster sampling, while useful for larger groups, may introduce bias by not ensuring a fully representative sample of high school students. A more randomised approach might improve the generalisability of the findings.

The role of self-regulated online learning behaviours in mediating the relationship between personality traits and student engagement in online learning environments was investigated by Kara, Ergulec and Eren (2024). A total of 437 university students from educational, social and health sciences disciplines participated in the study. Data were collected using the Big Five Inventory of Personality Traits, the Self-Regulated Online Learning Questionnaire, and the Student Engagement in the Online Learning Environment Scale. Structural equation modelling with bootstrap analysis was used to analyse the data. The results showed that the five-factor personality traits significantly predicted self-regulated online learning, which in turn was a strong predictor of student engagement. In addition, personality traits directly influenced student engagement, with self-regulated online learning acting as a partial mediator. The study focused exclusively on online learning contexts, which limits its applicability to traditional or blended learning environments. Furthermore, it primarily examined personality traits as predictors of engagement, overlooking the role of motivational orientations. Given the critical role of motivation in self-regulated learning and engagement, the inclusion of motivational constructs could have provided a more comprehensive understanding of student engagement in different learning settings. Therefore, it was proposed that undergraduate Economics students' self-regulated learning does not mediate the relationship between their motivational orientations and academic engagement.

Conceptual Framework

In this study, higher education Economics students' motivational orientations, self-regulated learning and academic engagement were examined. This section presents the conceptual framework of the study that was proposed based on the research questions and hypotheses. Figure 1 shows the conceptual framework of the study.

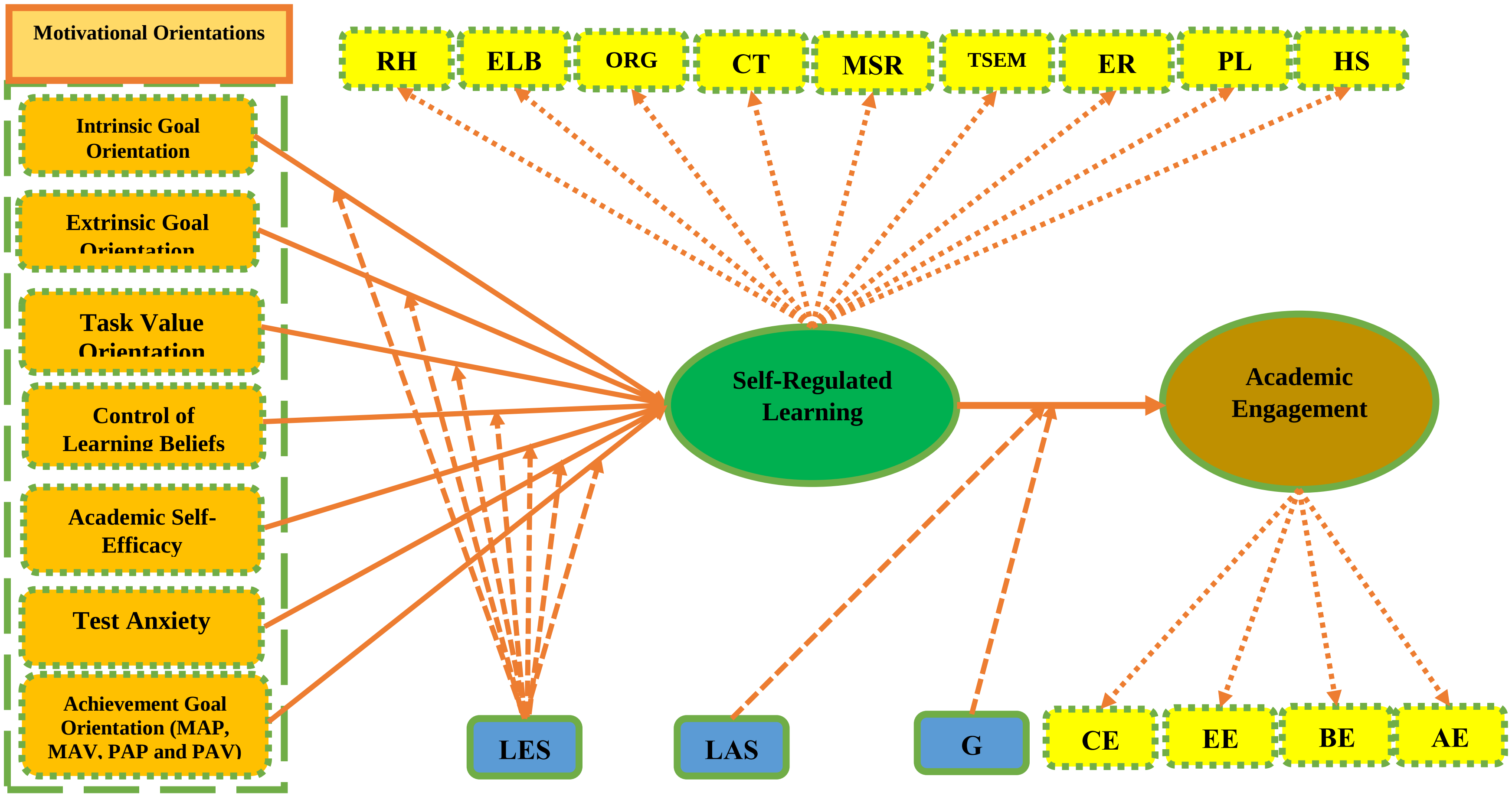


Figure 1: Conceptual framework
Source: Author's construct (2023).
Note: MAP = Mastery Approach Goal Orientation; MAV = Mastery Avoidance Goal Orientation; PAP = Performance Approach Goal Orientation; PAV = Performance Avoidance Goal Orientation; RH = Rehearsal; ELB = Elaboration; ORG = Organisation; CT = Critical Thinking; MSR = Metacognitive Self-Regulation; TSEM = Time and Study Environment Management; ER = Effort Regulation; PL = Peer Learning; HS = Help Seeking; LES = Level of Economics Students; LAS = Lecturer Academic Support; G = Gender; CE = Cognitive Engagement; EE = Emotional Engagement; BE = Behavioural Engagement and AE = Agentic Engagement.

The proposed conceptual framework (see Figure 1) for this study elucidates the intricate interplay among various motivational orientations, self-regulated learning dimensions, academic engagement, and moderating factors such as academic level, gender, and lecturer's academic support within the context of Economics education. This framework is a robust foundation for understanding the dynamics that shape students' academic experiences and outcomes.

At the framework's core, Economics students' motivational orientations encompass intrinsic and extrinsic goal orientations, academic self-efficacy, task value orientation, control of learning beliefs, test anxiety, mastery approach and avoidance goal orientations, and performance approach and avoidance goal orientations. These orientations are pivotal determinants of students' approach towards learning tasks and their degree of mastery or performance focus. Specifically, mastery approach and avoidance goal orientations (MAP and MAV) emphasise the pursuit or avoidance of mastering material. In contrast, performance approach and avoidance goal orientations (PAP and PAV) underscore achieving favourable performance outcomes or avoiding negative evaluations. These motivational orientations are poised to significantly influence students' engagement in self-regulated learning behaviours.

Self-regulated learning, characterised by rehearsal, elaboration, organisation, critical thinking, metacognitive self-regulation, time and study environment management, effort regulation, peer learning, and help-seeking, emerges as the mechanism through which students actively monitor, control, and regulate their learning processes. This multifaceted construct encapsulates diverse strategies and cognitive processes employed by students to optimise their learning outcomes. Notably, the proposed framework posits that students' motivational orientations are antecedents of their engagement in self-regulated learning behaviours, suggesting a reciprocal relationship between motivational factors and self-regulation processes.

Furthermore, the framework acknowledges the moderating role of academic level (LES) in shaping the relationship between motivational orientations and self-regulated learning. As students progress through their academic journey, their expertise and familiarity with disciplinary content may influence the salience and efficacy of motivational factors in driving self-regulated learning behaviours.

The proposed framework conceptualises self-regulated learning as a pivotal precursor to students' academic engagement. Cognitive engagement (CE), the first dimension of academic engagement, refers to the degree to which students immerse themselves intellectually in learning tasks, demonstrating deep cognitive involvement and the active processing of information. Self-regulated learning strategies such as elaboration, critical thinking, and metacognitive self-regulation play a crucial role in fostering cognitive engagement by facilitating the meaningful processing of course material, promoting higher-order thinking skills, and enabling students to monitor and regulate their cognitive processes effectively.

Emotional engagement (EE) pertains to students' affective responses and emotional investments in academic activities. Self-regulated learning behaviours, such as effort regulation and help-seeking can significantly impact emotional engagement by influencing students' perceptions of task difficulty, self-efficacy beliefs, and emotional experiences during learning. Effective regulation of effort and seeking appropriate assistance when faced with challenges can mitigate negative emotions, such as anxiety and frustration, fostering a positive emotional climate conducive to learning.

Behavioural engagement (BE) encompasses students' active participation in and persistence in learning activities, including attendance, completion of assignments, and adherence to academic tasks. Self-regulated learning dimensions, such as time and study environment management, peer learning, and rehearsal, are instrumental in shaping behavioural engagement by facilitating effective time management, creating collaborative learning experiences, and enhancing students' engagement in repetitive practice and rehearsal of course material.

Agentic engagement (AE) reflects students' sense of agency and ownership over their learning processes, encompassing self-regulation, initiative, and goal-directedness. Metacognitive self-regulation, organisation, and help-seeking are particularly salient in promoting agentic engagement by empowering students to set meaningful learning goals, monitor their progress, and adapt strategies in pursuit of academic success. The hypothesised relationship posits that self-regulated learning dimensions collectively serve as precursors to students' cognitive, emotional, behavioural, and agentic engagement in academic endeavours within the Economics domain. By fostering effective self-regulation and strategic learning behaviours, students are poised to exhibit heightened levels of engagement across these dimensions.

Gender (G) and Lecturers' Academic Support (LAS) were proposed as moderators that condition the association between self-regulated learning and academic engagement. Gender-related differences in learning preferences and experiences, along with the varying levels of support provided by lecturers, can shape the extent to which self-regulated learning translates into meaningful academic engagement across cognitive, emotional, behavioural, and agentic dimensions. Additionally, in the conceptual framework, self-regulated learning was proposed as a mediator in the relationship between motivational orientations and academic engagement, based on its central role in shaping students' learning behaviour.

Essentially, the conceptual framework delineates a comprehensive model that elucidates the complex interplay between motivational orientations, self-regulated learning processes, academic engagement, and contextual moderators within Economics education. By elucidating these relationships, the framework offers valuable insights into the mechanisms underlying students' academic experiences. It provides a theoretical basis for informing pedagogical practices and interventions to enhance learning outcomes and student engagement in Economics education.

Summary and Implications for Current Study

This section focuses on the theoretical review, conceptual review, empirical review and conceptual framework constructed to guide the study. The Expectancy-Value Theory (EVT), self-regulated learning theory and engagement theory were used to underpin the study. These theories served as a foundation for understanding Economics students' motivational orientations, self-regulated learning and academic engagement. For instance, the EVT helped explain students' expectancy and value aspect of learning.

Studies on students' motivational orientations were reviewed. Diseth et al. (2020) found that students across different grade levels exhibited higher levels of extrinsic motivation than intrinsic motivation, while Khan et al. (2022) reported high levels of intrinsic and extrinsic motivational orientations among university students learning English. Moreover, Nurhasnah et al. (2022) and Mahmud et al. (2023) focused on specific contexts, revealing high levels of self-efficacy and intrinsic motivation among ninth-grade students in Padang City and university students in Gayo, respectively. However, Hameed et al. (2023) identified high levels of test anxiety among undergraduate students, which indicates a potential barrier to academic motivation.

Also, discrepancies exist in studies examining students' level of self-regulated learning (SRL) and academic engagement. While Mahama et al. (2022) found lower levels of SRL and academic engagement among college of education students, Brahman and Saikia (2023) reported high levels of self-regulated learning among college students in Assam. Yidana and Arthur (2022) focused specifically on cognitive engagement among Economics students, highlighting a high level of academic cognitive engagement. These inconsistencies underscore the need for further research to elucidate motivational orientation, self-regulated learning, and academic engagement among higher education economics students.

Existing research (e.g., Anazifa et al., 2023; Appiah-Kubi et al., 2022; Noviani et al., 2023; Stanikzai, 2020) have investigated the impact of gender on self-regulated learning (SRL) among students, and there remains a gap in the literature concerning the specific examination of SRL among Higher Education Economics students. Previous studies have reported conflicting findings regarding gender differences in SRL, with some indicating no significant disparity (Anazifa et al., 2023; Stanikzai, 2020), while others have identified male students as having higher self-regulated learning capacities than their female counterparts (Appiah-Kubi et al., 2022). Thus, further research is needed to elucidate the role of gender in SRL among Higher Education Economics students and to reconcile the inconsistencies in the literature.

Additionally, studies exploring differences in academic engagement based on gender and academic level, such as that by Hartono et al. (2019), Ganiyu (2021), Amoah et al. (2021), and Zhao et al. (2023), have produced mixed results. While some studies found significant gender disparities in academic engagement (Hartono et al., 2019; Ganiyu, 2021), others reported no significant differences (Amoah et al., 2021; Zhao et al., 2023). This inconsistency suggests further investigation to understand better the nuanced factors influencing academic engagement among Higher Education Economics students and to address gaps in the current literature.

While extensive research has explored the relationship between students' motivational orientations and self-regulated learning (SRL), there remains a gap in the literature concerning higher education Economics students' motivational orientations. Previous studies by Sen and Yilmaz (2016), Tosuncuoglu (2019), Abdulhay et al. (2020), Lim and Yeo (2021), Lee et al. (2020) and Fitriastuti et al. (2021), Nisa et al. (2022), Baars et al. (2017), El-Adl and Alkharusi (2020), Hayat et al. (2020), and El-Adl and Alkharusi

(2017) examined various motivational components and their relationships with SRL across diverse educational contexts. However, none have specifically investigated the influence of motivational orientations on SRL among higher education Economics students, highlighting a novel area for exploration within the field.

Furthermore, the current study reviewed empirical works on relationship between self-regulated learning (SRL) and academic engagement, particularly among various student populations; there remains a notable gap in the literature concerning higher education Economics students. Studies by Setiani and Wijaya (2020) and Gaxiola-Romero et al. (2020), Utami and Aslamawati (2021), Helsa and Lidiawati (2021), Dewi and Hadiana (2021), Stan et al. (2022), Azhari et al. (2023) and Wu et al. (2023), Liao et al. (2023), and Zare et al. (2024) examined the relationship between SRL and academic engagement in various educational contexts. Still, none of these studies focused on higher education Economics students. Despite findings indicating a positive correlation between SRL and academic engagement across diverse educational contexts, limited attention has been paid to understanding this relationship within the unique academic domain of higher education Economics, warranting further investigation to elucidate potential nuances and implications for pedagogical practices within this discipline. In addition, these studies have not used a robust statistical tool such as an artificial neural network.

Empirical studies reviewed revealed gender disparities in self-regulated learning (SRL) and academic engagement, but there is a notable gap regarding the moderating role of gender in the relationship between self-regulated learning and academic engagement. Despite indications from prior studies suggesting gender differences in SRL and academic engagement, further investigation is warranted to elucidate the nuanced interaction between gender and these educational constructs, thereby contributing to a more comprehensive understanding of effective learning strategies among diverse student populations.

Existing literature has consistently focused on the influence of teacher support on students' academic engagement and self-regulated learning, with numerous empirical studies underscoring its significance (Azila-Gbettor & Abiemo, 2021; Laxdal et al., 2020; Liu et al., 2018; Miao & Ma, 2023; Sadoughi & Hejazi, 2023). Moreover, complementary research by Setiani and Wijaya (2020), Gaxiola-Romero et al. (2020), and Azhari et al. (2023) has consistently identified a positive association between self-regulated learning and academic engagement. However, there remains a dearth of literature specifically investigating the moderating role of lecturers' academic support on the relationship between self-regulated learning and academic engagement, thus warranting further investigation to ascertain its influence in educational settings.

Moreover, the studies reviewed showed a lacuna in the literature regarding the moderating role of academic level on the relationship between students' motivational orientations and self-regulated learning. The current study aims to address this gap by investigating whether the academic levels of Economics students moderate this relationship, building upon previous findings that suggest dynamic changes in students' motivational orientations throughout their academic journey, possibly leading to declines as they progress.

Lastly, although previous studies have explored mediating factors between student engagement and motivation, the role of self-regulated learning remains underexplored, particularly in traditional academic settings. While Ghelichli et al. (2021) found no mediating effect of self-regulated learning between student engagement and language learning motivation, their study was limited by a small, homogeneous sample. Similarly, Zhang et al. (2022) and Zhong et al. (2023) identified other mediators such as perceived school climate, academic self-efficacy and learning strategies, but did not consider self-regulated learning. Kara et al. (2024) demonstrated the mediating role of self-regulated online learning between personality traits and engagement, but overlooked motivational orientations. These gaps highlight the need for further investigation into whether self-regulated learning mediates the relationship between motivational orientations and academic engagement. Given these limitations, it is proposed that self-regulated learning does not mediate this relationship among undergraduate Economics students.

CHAPTER THREE

RESEARCH METHODS

Overview

The study examines Economics students' motivational orientations, self-regulated learning and academic engagement at the University of Cape Coast. This chapter describes the methods adopted to enable researchers who want to replicate the study to follow the procedures used to arrive at the findings. This chapter describes the research philosophy and approach based on which the study design was selected. Also, it describes the research design, population, respondents, data collection instruments, validity and reliability tests, data collection procedures, ethical considerations and data processing and analysis. Figure 2 shows the flowchart of the research methods employed for the study.

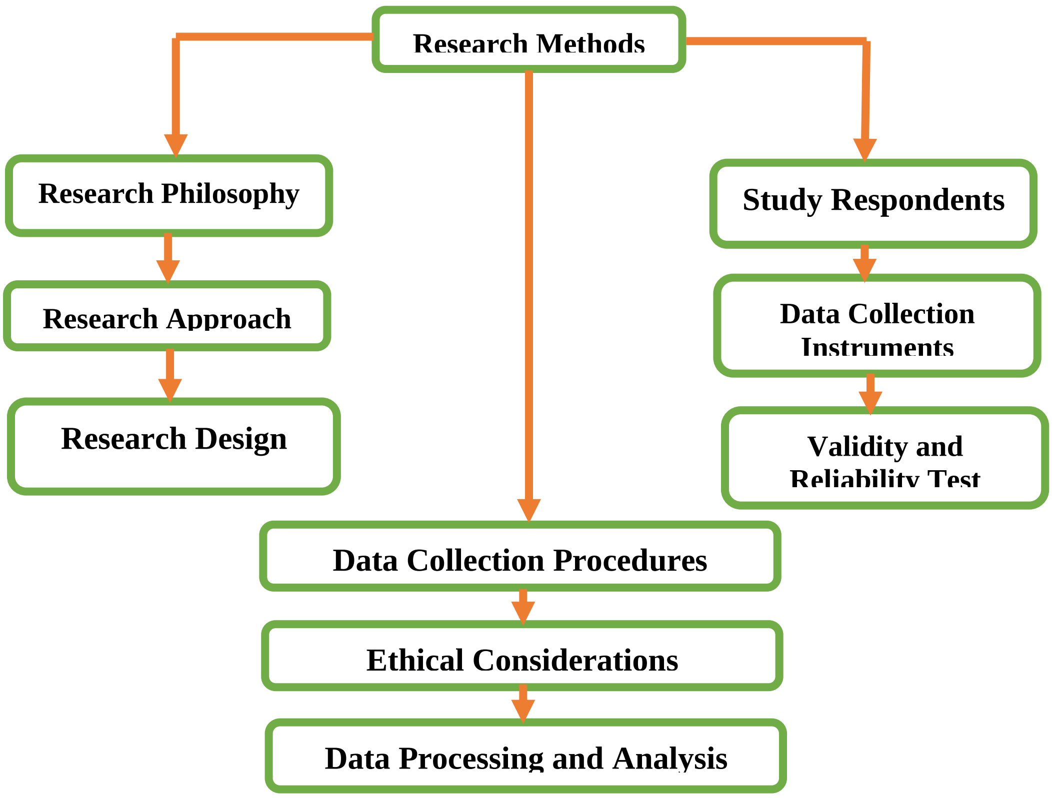


Figure 2: Research methods flowchart
Source: Author's Construct

Research Philosophy

Each research endeavour is built upon a foundation that reflects the worldview chosen by the researcher (Creswell & Plano Clark, 2018). This foundation serves as a philosophy that governs and guides research.

Positivist Paradigm

The foundational framework guiding this study is positivism. This approach highlights the impartiality of the research procedure (Creswell, 2014). Positivism asserts that reality can be observed, grasped objectively, quantified, and interpreted (Babbie, 2021; Cohen, Manion & Morrison, 2018). The selection of this research paradigm enabled the researcher to maintain an external stance on the research location and exert control over the entire research progression. Due to the quantitative essence of this study, embracing the positivist standpoint allowed the researcher to examine tangible data and analyse outcomes objectively.

A researcher's philosophy refers to their personal perspective on what constitutes acceptable knowledge and the methodology by which such knowledge is established (Saunders, Lewis & Thornhill, 2016). It is a comprehensive concept encompassing a set of beliefs, assumptions, and principles concerning the generation and development of knowledge, as well as how knowledge is connected to scientific research inquiry (Sekaran & Bougie, 2016).

Positivism, alternatively referred to as direct realism, establishes its philosophical position within the domain of natural sciences, where social realities are scrutinised to generate broad and law-like generalisations, such as cause and effect relationships (Bougie & Sekaran, 2019). This approach is valuable for producing a precise, reliable, and explicit understanding of a particular phenomenon. A positivist's main focus lies in the observation of phenomena and the ability to forecast their outcomes (Hair, Celsi, Money, Samouel & Page, 2016).

Positivists often employ scientific methods to propose and evaluate theories using carefully structured and quantifiable data where the researcher's personal values do not influence the investigation (Creswell, 2014). According to the positivists, observable and measurable phenomena can be considered factual knowledge, leading to the belief that the researcher's perspectives do not impact the interpretation of the object under study (Hair et al., 2016). Positivism places great importance on employing well-organised, easily replicated methodologies (Saunders et al., 2023). The term ‘positivism’ itself highlights the significance of what is being postulated, underscoring the positivist's strong emphasis on scientific research methods aimed at generating objective data and factual information unaffected by human biases (Bryman, 2016).

Positivists believe that during the research process, it is important for the researcher to maintain a sense of detachment from the subject under investigation and treat it as an object (Omodan, 2024). Consequently, researchers who align with the positivist philosophy also adopt a purely quantitative research approach (Hair et al., 2016).

Research Approach

This study adopts a quantitative research approach based on positivist ontology. Previous studies (Appiah, Ameko, Asiamah & Duker, 2023; Appiah, Boateng, Abugri & Barnes, 2022) have highlighted one of the key advantages of the quantitative research approach: its capacity to support statistical modelling and hypothesis testing. The present study employed a quantitative methodology to gather essential primary data on higher education Economics students' motivational orientations, self-regulated learning and academic engagement.

A quantitative approach involves set of mathematical and statistical techniques to examine data, as highlighted by Brandt and Timmermans (2021). Faems (2020) observed that quantitative methods are valuable for quantifying the magnitude, variability, and alterations in variables and for uncovering connections between variables and making predictions. Such methods are applicable for investigating diverse phenomena, encompassing economic, social, and scientific domains (Klein & Müller, 2019).

Research Design

According to Sekaran and Bougie (2016), research design can be defined as a meticulously constructed plan encompassing data collection, measurement, and analysis, devised to address explicitly defined research questions. This study employed a descriptive cross-sectional survey design to examine Economics students' motivational orientations, self-regulated learning and academic engagement in higher education.

Cross-sectional investigations encompass the acquisition of data from multiple respondents during a specific instance with the aim of addressing research questions (Hair et al., 2016). Such studies were conducted at a particular moment to gain insight into a phenomenon (Saunders et al., 2016). Correspondingly, Sekaran and Bougie (2016) asserted that a cross-sectional study involves a single occurrence of data collection focused on addressing the research question, albeit within relatively brief periods ranging from a few days to several months. Also, this design helps to describe or elucidate a phenomenon at a specific point in time (Wilson, 2014). In addition, according to Bell, Bryman and Harley (2022), the descriptive cross-sectional survey design is versatile, as it identifies present circumstances and addresses immediate requirements.

Moreover, the chosen research design aligns with a quantitative research approach. This design was chosen because the variables under investigation were not manipulated but examined in their existing states or conditions (Siedlecki, 2020). In this design, the researcher aims to describe the variables of interest without manipulating them. Unlike experimental designs that manipulate variables to establish causal relationships, a descriptive cross-sectional survey focuses on capturing a snapshot of the variables in their existing state or conditions (Siedlecki, 2020). This approach is particularly suitable for studying complex phenomena, such as motivational orientations, self-regulated learning, and academic engagement in the context of Economics education. The choice of this design aligns with the goal of understanding the current state of motivational factors and learning behaviours among Economics students in higher education, providing valuable insights into their academic engagement.

Furthermore, the cross-sectional design proves valuable in the context of this study as it facilitates the exploratory establishment of relationships among multiple variables (Spector, 2019).

Population

The study population comprised all Level 100, 200, 300 and 400 B.Ed Social Sciences (Economics major) students at the University of Cape Coast. The target pollution delineates an all-encompassing collection of components within a specific population, referring to the central subject of investigation from which the research samples are selected (Bryman, 2016; Hair et al., 2016; Sekaran & Bougie, 2016). The target population for this study encompassed all B.Ed Social Sciences (Economics major) students. The population for this study comprised all Economics students (N = 497) who were reading B.Ed Social Sciences (Economics major) during the 2022-2023 academic year, totaling 497 students.

All 497 Economics students were included in the study employing the census method to ensure a comprehensive analysis. The decision to use the census method was based on several justifications. First, by encompassing the entire population, the study aimed to achieve a high level of accuracy in predicting the dependent variables in the study and eliminating potential sampling errors (Kothari & Garg, 2019). Secondly, in line with the recommendations of Field (2018) and Field (2022) for predictive studies, a large sample size is deemed essential for using robust statistics. It is widely acknowledged that larger sample sizes contribute to higher predictive accuracy (Field, 2018; Field, 2022).

Table 1: Population Distribution of Economics Students

Level of Study	Gender	Total Number	Percentage (%)
100	Male	149	29.97
(N = 220)	Female	71	14.28
200	Male	63	12.68
(N = 88)	Female	25	5.03
300	Male	65	13.08
(N = 103)	Female	38	7.65
400	Male	55	11.07
(N = 86)	Female	31	6.24
Total		497	100

Source: Department of Business and Social Sciences Education 2022-2023, University of Cape Coast.

Respondents

All Level 100, 200, 300 and 400 B.Ed Social Sciences (Economics major) students participated in this study. Hence, the census method included all Levels of 100, 200, 300 and 400 B.Ed. Social Sciences (Economics major). According to Saunders et al. (2023), occasionally, it may be possible to collect and analyse data from every possible case or group member; this is termed a census. For this current study, the census method involved all of the Economics students. Ogah (2013) proposed that, in instances where the population size is relatively small, gathering data from every individual within the population may be feasible. Furthermore, it is generally accepted that larger samples yield more accurate results than smaller ones, provided that larger samples are both accessible and available (Gall, Gall & Borg, 2007). Figure 2 shows the number of Economics students involved in the study based on their academic level and gender.

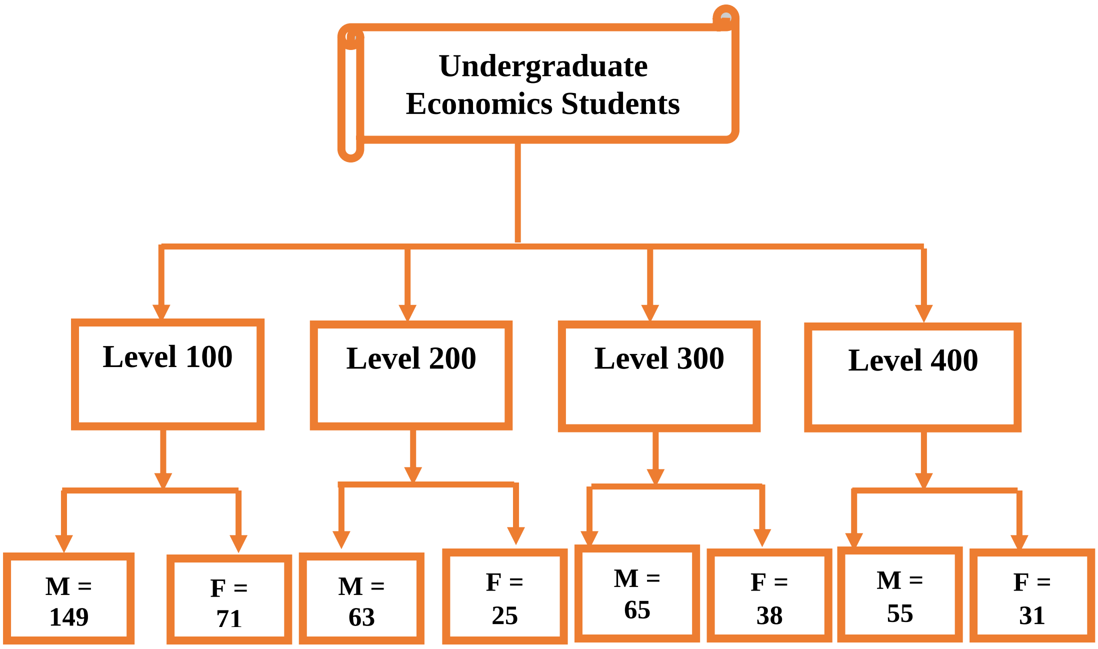


Figure 3: Distribution of Respondents based on Academic Level and Gender
Note: M = Male and F = Female
Source: Author's Construct

Data Collection Instruments

The study dependent on four primary data collection instruments. Data were gathered through the Motivational Orientations Scale (MOS), Self-Regulated Learning Scale (SRLS), Academic Engagement Scale (AES), and Lecturer's Academic Support Scale (LASS) [see Appendix A]. These scales were adapted as the data collection instruments. The adaptation of the scales was to make it appropriate and applicable to be used in the Ghanaian context.

The questionnaire was structured into five sections: A, B, C, D, and E. Section A collected information on respondents' demographics, specifically gender, age, and academic level of students and comprised three items. Section B sought to gather information on Economics students' motivational orientations, and consisted of 43 items. Section C also focused on economics students' SRL, which had 50 items. Furthermore, Section D collected information on academic engagement of Economics students and was composed of 20 items. Lastly, Section E collected information on the lecturer's academic support and comprised 5 items. The questionnaire had 121 items, including respondents' demographic information.

Motivational Orientations Scale (MOS)

The MOS was adapted and used to gather data on economics students' motivational orientations. The instrument was developed by Pintrich et al. (1993), and Elliot and Murayama (2008). The MOS comprises 43 items with ten sub-scales: academic self-efficacy, control of learning beliefs, extrinsic goal orientation, intrinsic orientation, mastery approach goal orientation, mastery avoidance goal orientation, performance-approach goal orientation, performance-avoidance goal orientation, task value orientation, and test anxiety. The 7- point scale of the original version was adapted to a five-point Likert scale: 1 (not true of me), 2 (rarely true of me), 3 (sometimes true of me), 4 (often true of me), and 5 (very true of me).

In addition, some of the words were relatively complex and were therefore changed to enhance the respondents' understanding of the importance of the statements. Table 2 provides an example of items on each dimension and how they were modified or altered.

Table 2: Examples of Modifications made on the MOS

Dimensions	Original Items	Modified Items
Intrinsic Goal Orientation	"In a class like this, I prefer course material that really challenges me so I can learn new things".	"I prefer *Economics* course material that really challenges me so I can learn new things".
	"The most satisfying thing for me in this course is trying to understand the content as thoroughly as possible".	"The most satisfying thing for me in this *Economics* course is trying to understand the content as thoroughly as possible".
Extrinsic Goal Orientation	"Getting a good grade in this class is the most satisfying thing for me right now".	"Getting a good grade in this *Economics* class is the most satisfying thing for me right now".
	"I want to do well in this class because it is important to show my ability to my family, friends, employer, or others".	"I want to do well in this *Economics* class because it is important to show my ability to my family, friends, employer, or others".
Task Value Orientation	"I think I will be able to use what I learn in this course in other courses".	"I think I will be able to use what I learn in this *Economics* course in other courses".
	"Understanding the subject matter of this course is very important to me".	"Understanding the subject matter of this *Economics* course is very important to me".
Control of Learning Beliefs	"If I study in appropriate ways, then I will be able to learn the material in this course".	"If I study in appropriate ways, then I will be able to learn the material in this *Economics* course".
	"If I try hard enough, then I will understand the course material".	"If I try hard enough, then I will understand the *Economics* course material".
Academic Self-Efficacy	"I am certain I can understand the most difficult material presented in the readings for this course".	"I am certain I can understand the most difficult material presented in the readings for this *Economics* course".
	"I am confident I can do an excellent job on the assignments and tests in this course".	"I am confident I can do an excellent job on the assignments and tests in this *Economics* course".
Test Anxiety	"When I take tests I think of the consequences of failing".	"When I take *Economics* tests I think of the consequences of failing".
	"I have an uneasy, upset feeling when I take an examination".	"I have an uneasy, upset feeling when I take an *Economics* examination".
MAP	"My aim is to completely master the material presented in this class."	"My aim is to completely master the material presented in this *Economics* class".
MAV	"I am striving to avoid an incomplete understanding of the course material".	"I am striving to avoid an incomplete understanding of the *Economics* course material".
PAP	"My goal is to perform better than the other students".	"My goal is to perform better *in this Economics class* than the other students".
PAV	"My goal is to avoid performing poorly compared to others".	"My goal is to avoid performing poorly *in this Economics class* compared to *other students"*.

Note: MAP = Mastery approach goal orientation; MAV = Mastery avoidance goal orientation; PAP = Performance approach goal orientation and PAV = Performance avoidance goal orientation.

Source: Fieldwork (2023)

Self-Regulated Learning Scale (SRLS)

The SRLS was adapted and used to gather data on Economics students' level of self-regulated learning. This instrument was developed by Pintrich et al. (1993). The SRLS comprises 50 items with ten sub-scales: critical thinking, elaboration, effort regulation, help-seeking, metacognitive self-regulation, organisation, planning, rehearsal, and time and study environment management. The 7-point scale in the original version was adapted to a five-point Likert scale, that is, 1 (Not at true of me), 2 (Rarely true of me), 3 (Sometimes true of me), 4 (Often true of me) and 5 (Very true of me). Table 3 shows some of the modifications made to the SRLS.

Table 3: Examples of Modifications made on the SRLS

Dimensions	Original Items	Modified Items
Rehearsal	"When I study for this class, I practice saying the material to myself over and over".	"When I study for this *Economics* class, I practice saying the material to myself over and over".
	"I make lists of important terms for this course and memorise the lists".	"I make lists of important terms for this *Economics course* and memorise the lists".
Elaboration	"When I study for this class, I pull together information from different sources, such as lectures, readings, and discussions".	"When I study for this *Economics* class, I pull together information from different sources, such as lectures, course materials, and discussions".
	"When reading for this class, I try to relate the material to what I already know".	"When reading for this *Economics* class, I try to relate the material to what I already know".
Organisation	"When I study the readings for this course, I outline the material to help me organise my thoughts".	"When I study the *materials (e.g., handouts and textbooks) for this Economics course*, I outline the material to help me organise my thoughts".
	"When I study for this course, I go through the readings and my class notes and try to find the most important ideas".	"When I study for this *Economics* course, I go through the materials (*e.g., handouts and textbooks*) and my class notes and try to find out the most important ideas".
Critical Thinking	"I often find myself questioning things I hear or read in this course to decide if I find them convincing".	"I often find myself questioning things I hear or read in this *Economics* course to decide if I find them convincing".
	"When a theory, interpretation, or conclusion is presented in class or in the readings, I try to decide if there is good supporting evidence".	"When a theory, interpretation, or conclusion is presented in this *Economics* class or in the *Economics course material*, I try to decide if there is good supporting evidence".
Metacognitive Self-Regulation	"When I become confused about something I'm reading for this class, I go back and try to figure it out".	"When I become confused about something I am reading for this *Economics* class, I go back and try to figure it out".
	"I try to change the way I study in order to fit the course requirements and instructor's teaching style".	"I try to change the way I study in order to fit the *Economics* course requirements and instructor's teaching style".
Time and Study Environment Management	"I usually study in a place where I can concentrate on my course work".	"I usually study in a place where I can concentrate on my *Economics* course work".
	"I make sure I keep up with the weekly readings and assignments for this course".	"I make sure I keep up with the weekly readings and assignments for this *Economics* course".
Effort Regulation	"When course work is difficult, I give up or only study the easy parts".	"When *Economics* course work is difficult, I give up or only study the easy parts".
Peer Learning	"When studying for this course, I often set aside time to discuss the course material with a group of students from the class".	"When studying for this *Economics* course, I often set aside time to discuss the course material with a group of students from the class".
Help Seeking	"I try to identify students in this class whom I can ask for help if necessary".	"I try to identify students in this *Economics* class whom I can ask for help if necessary".

Source: Fieldwork (2023)

Academic Engagement Scale (AES)

The AES was adapted and used to gather data on Economics students' level of academic engagement. This instrument was developed by Maroco, Maroco, Campos and Fredericks (2016), and Veiga (2016). The AES comprises 20 items with four dimensions: emotional engagement, behavioural engagement, cognitive engagement, and agentic engagement. The items are measured on a five-point Likert scale: 1 (Strongly Disagree), 2 (disagree), 3 (Moderately Agree), 4 (agree), and 5 (Strongly Agree). Table 4 presents some of the modifications made to AES.

Table 4: Examples of Modifications made on the AES

Dimensions	Original Items	Modified Items
Behavioural Engagement	When I have doubts, I ask questions and participate in activities in the classroom.	When I have doubts, I ask questions and participate in activities in the *Economics class*.
Emotional Engagement	I am interested in the schoolwork.	I am interested in the *Economics course work.*
Cognitive Engagement	When I read a book, I question myself to make sure I understand the subject I am reading about.	When I read *an Economics textbook (or handout), I reflect on it to* make sure I understand the concept I am reading about.
Agentic Engagement	I offer suggestions to my lecturer about how to make the class better.	I offer suggestions to my *Economics* lecturer about how to make the *Economics* class better.

Source: Fieldwork (2023)

Lecturer's Academic Support Scale (LASS)

The teacher academic support scale was adapted to gather data on the lecturer's academic support. The instrument was developed by Johnson, Johnson and Anderson (1983). It is a unidimensional scale with five (5) items. Table 5 presents some of the modifications made to LASS.

Table 5: Examples of Modifications made on the LASS

Scale	Original Items	Modified Items
Lecturer Academic Support	My lecturer wants me to do my best in this course.	My lecturer wants me to do my best in this *Economics* course.
	My lecturer's questions help me to understand.	My lecturer's questions help me to understand *the concepts and theories in Economics.*

Source: Fieldwork (2023)

Validity and reliability of Instruments

Validity and reliability assessments were performed on the research instruments to ascertain their effectiveness. This was undertaken to guarantee the credibility of the data collected for the study, as these instruments serve as indicators of research quality (Mohamad, Sulaiman, Sern & Salleh, 2015). It is critical for researchers always to establish content and construct validity (Almanasreh, Moles & Chen, 2019; Tavakol & Wetzel, 2020). The scales used for the data collection were validated by the various authors who developed them.

Also, the items on the various scales were modified and the researcher's supervisors further validated its content. In that case, Samuels (2017) suggests that Confirmatory Factor Analysis (CFA) should be used to re-confirm the factors. Said, Badru and Shahid (2011) emphasised that CFA should be run on a standardised instrument using Analysis of Moment Structures (AMOS) and focus placed on the results of the regression weights.

Additionally, Tashakkori, Johnson and Teddlie (2020), and Pallant (2020) recommended that carrying out a pilot study can help to uncover potential challenges with the research instrument and establish the foundation for the main study. Therefore, the MOS was piloted on 50 randomly selected Bachelor of Arts Economics students based on the guideline provided by Baker (1994). Baker stated that 10-20% of the actual study's sample should be selected for a pilot study. Hertzog (2008) indicated that a sample size ranging from 10 to 40 participants is suitable for conducting a pilot study. Hence, a pilot study was conducted using a sample size of 50 participants.

The assessment of reliability using Cronbach's alpha is hindered by the complex nature of higher order constructs, which encompasses multiple dimensions. As Hayes and Coutts (2020) pointed out, the utilisation of Cronbach's alpha for multidimensional scales may produce inaccurate evaluations of reliability. Therefore, in order to ensure the validity of the current reliability assessments, it was deemed necessary to calculate McDonald's omega (Hayes & Coutts, 2020). The Cronbach alpha and McDonald's omega values for the scales for the pilot study are presented in Table 6.

Table 6: Cronbach α and McDonald's ω values for the Pilot Study

Constructs	No. of Items	α	ω
Intrinsic Goal Orientation	4	.622	.660
Extrinsic Goal Orientation	4	.755	.760
Task Value Orientation	6	.843	.859
Control of Learning Beliefs	4	.704	.712
Academic Self-Efficacy	8	.790	.791
Test Anxiety	5	.795	.813
Mastery Approach Goal Orientation	3	.515	.624
Mastery Avoidance Goal Orientation	3	.726	.825
Performance Approach Goal Orientation	3	.856	.858
Performance Avoidance Goal Orientation	3	.853	.856
Rehearsal	4	.790	.798
Elaboration	6	.762	.768
Organisation	4	.638	.667
Critical Thinking	5	.772	.783
Metacognitive Self-Regulation	12	.804	.824
Time and Study Environment Management	8	.611	.617
Effort Regulation	4	.662	.669
Peer Learning	3	.650	.686

Table 6: Cont'd

Help Seeking	4	.670	.691
SRL Scale	50	.901	.912
Behavioural Engagement	5	.721	.722
Emotional Engagement	5	.758	.755
Cognitive Engagement	5	.714	.685
Agentic Engagement	5	.892	.879
AEG Scale	20	.834	.831
Lecturer's Academic Support	5	.836	.851

Note: α = Cronbach Alpha; ω = MacDonald Omega; SRL = Self-regulated learning and AEG = Academic engagement
Source: Fieldwork (2023)

In Table 6, all constructs except mastery approach goal orientation, which has a Cronbach alpha value of .515, have Cronbach alpha values within the threshold of 0.60 and above. An acceptable measure of reliability for assessing the suitability of the instrument is achieved when the coefficient reaches .60 or higher (Awang, 2015; DeVellis & Thorpe, 2021). Additionally, the reliability of the constructs is affirmed by omega estimates exceeding 0.6 (Hayes & Coutts, 2020; Huck, 2011).

Motivational Orientations Scale

Confirmatory Factor Analysis (CFA) was employed on the collected study data to substantiate the conceptualisation of the motivational orientations scale,. The visual representation of the CFA model for the motivational orientations scale is presented in Figure 4.

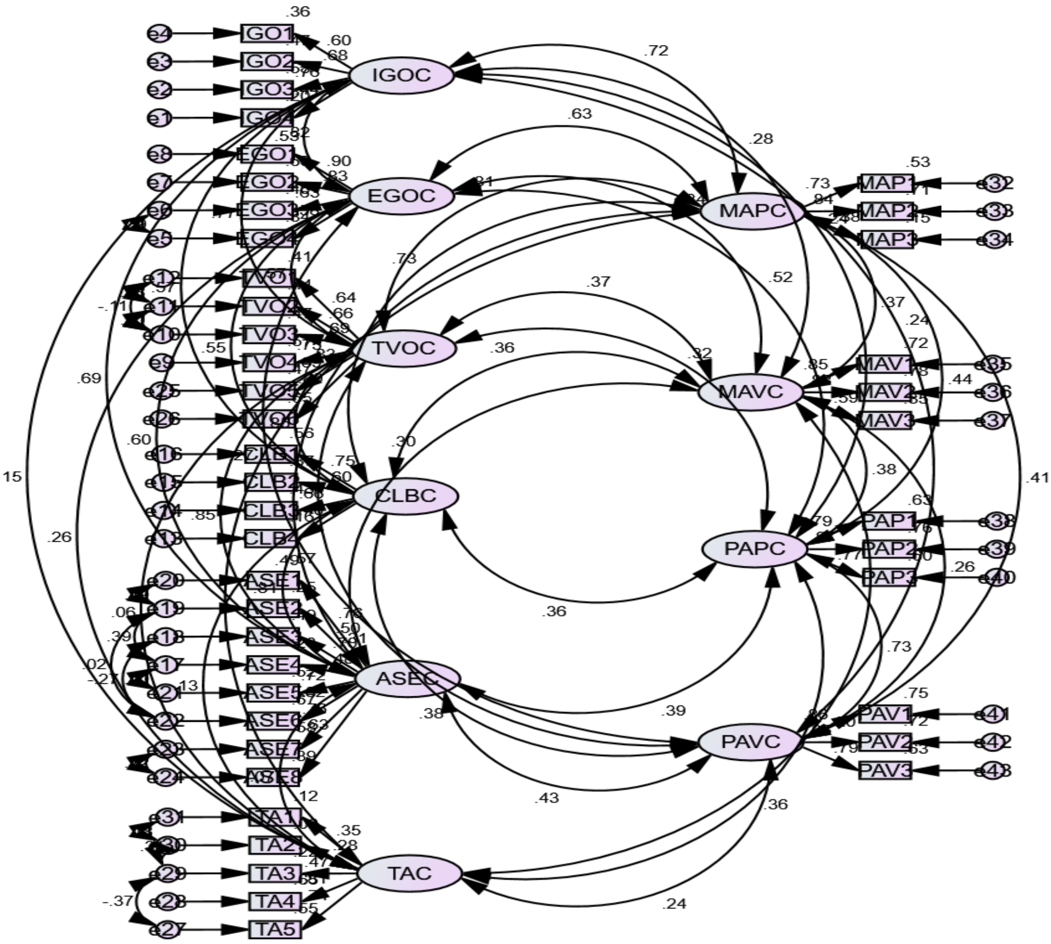


Figure 4: A CFA model for MO Scale
Source: Fieldwork (2023)

The Confirmatory Factor Analysis (CFA) results for the MO scale were calculated using the Maximum Likelihood (ML) method. The assessment of goodness-of-fit indices aims to establish the validity of a perfect fit (indicated by a non-significant χ^2) or an approximate fit (indicated by a Standardised Root Mean Square Residual, SRMR, of $\leq .08$) [Asparouhov & Muthen, 2018]. This determination is crucial for investigating the loading and Average Variance Extracted (AVE) as an indicator of construct validity. The results of the goodness-of-fit analysis are presented in Table 7.

Table 7: Goodness of Fit Indices for MOS Scale

Fit Indices	Estimates	Recommended Threshold	Reference
χ^2	2184.741 ($p < .001$)	> .05	Hair Black, Babin, Anderson and Tatham (2010)
CMIN/DF	2.724	≤ 2 or 3	Schreiber (2008)
CFI	.862	≥ .90	Kline (2013)
NFI	.800	≥ .90	Kline (2013)
IFI	.863	≥ .90	Kline (2013)
TLI	.844	≥ .90	Kline (2013)
RMSEA	.062	≤ .08	Schreiber (2008)
SRMR	.072	≤ .08	Kline (2023)

Note: χ^2 = Chi-square; CMIN/DF: Ratio of χ^2 to df; CFI = Comparative Fit Index; NFI = Normed Fit Index; IFI = Incremental Fit Index; TLI = Tucker-Lewis Index; RMSEA= Root Mean Square Error of Approximation; SRMR = Standardised Root Mean Residual
Source: Fieldwork (2023)

The goodness of fit indices, as highlighted by Asparouhov and Muthen (2018), determine whether an exact fit (where χ^2 is not significant) or an approximate fit (where SRMR is ≤ .08) is feasible. These indices enable the evaluation of standardised regression weights (loadings) and AVE to assess the construct validity. All indices indicate that the MO scale demonstrates an approximate fit (SRMR ≤ .08). Details regarding item loadings, AVE, and reliability are presented in Table 8.

Table 8: Items, Factor Loadings, Reliability and AVE of MO Scale

Factors/Constructs	No of Items	Items	Factor Loading	α	ω	CR	AVE
Academic Self-Efficacy (ASE)	8	ASE1	.756***	.870	.870	.870	.463
		ASE2	.500***				
		ASE3	.700***				
		ASE4	.476***				
		ASE5	.724***				
		ASE6	.819***				
		ASE7	.761***				
		ASE8	.625***				
Control of Learning Beliefs (CLB)	4	CLB1	.748***	.677	.677	.700	.379
		CLB2	.605***				
		CLB3	.658***				
		CLB4	.396***				
Extrinsic Goal Orientation (EGO)	4	EGO1	.904***	.836	.831	.831	.559
		EGO2	.826***				
		EGO3	.630***				
		EGO4	.584***				
Intrinsic Goal Orientation (IGO)	4	IGO1	.600***	.708	.716	.720	.400
		IGO2	.684***				
		IGO3	.759***				
		IGO4	.443***				
Mastery Approach Goal Orientation (MAP)	3		.727***	.638	.667	.703	.463
		MAP1					
		MAP2	.844***				
		MAP3	.383***				
Mastery Avoidance Goal Orientation (MAV)	3		.851***	.812	.838	.826	.619
		MAV1					
		MAV2	.883***				
		MAV3	.595***				
Performance Approach Goal Orientation (PAP)	3		.791***	.851	.852	.854	.662
		PAP1					
		PAP2	.873***				
		PAP3	.773***				
Performance Avoidance Goal Orientation (PAV)	3		.865***	.874	.875	.875	.701
		PAV1					
		PAV2	.851***				
		PAV3	.794***				
Test Anxiety (TA)	5	TA1	.353***	.714	.719	.676	.325
		TA2	.282***				
		TA3	.471***				
		TA4	.808***				
		TA5	.738***				
Task Value Orientation (TVO)	6	TVO1	.642***	.862	.862	.857	.502
		TVO2	.661***				
		TVO3	.689***				
		TVO4	.754***				
		TVO5	.688***				
		TVO6	.803***				

Note: α = Cronbach Alpha; ω = MacDonald Omega; AVE = Average Variance Extracted; CR = Composite Reliability; ***$p < .001$
Source: Fieldwork (2023)

From Table 8, all the items had factor loadings within the recommended threshold except for item TA2 that had low factor loading of .282 (Pallant, 2020). It can be observed that all the regression estimates were significant (Awang, 2014). The values of Cronbach alpha ranges from .638 to .874 were above the acceptable threshold of .60 or .70 (Awang, 2014; Hair et al., 2010). Likewise, composite reliability (CR) values were above the threshold of .60 or .70 (Hair et al., 2010). Hence, the values revealed adequate internal consistency reliability between the latent constructs. Lastly, the values of the AVE ranged from .325 to .701. Hence, some of the constructs' AVEs (e.g., AVE_{TA} = .325; AVE_{CLB} = .379) were lower than the recommended threshold of .50 (Kline, 2015). However, according to Fornell and Larcker (1981), if the AVE is less than .50 but CR is higher than 0.60, the convergent validity of the construct is still adequate. Thus, the convergent validity criterion has been met for the construct.

Discriminant Validity for MO Scale

The discriminant validity for the MO scale was examined using HTMT criterion. Table 9 shows the results for the HTMT ratio.

Table 9: HTMT Analysis

	IGO	EGO	TVO	CLB	ASE	TA	MAP	MAV	PAP	PAV
IGO										
EGO	0.540									
TVO	0.773	0.661								
CLB	0.582	0.654	0.816							
ASE	0.695	0.636	0.849	0.842						
TA	0.253	0.392	0.143	0.294	0.203					
MAP	0.804	0.753	0.856	0.711	0.835	0.428				
MAV	0.358	0.444	0.425	0.409	0.393	0.309	0.545			
PAP	0.267	0.571	0.326	0.413	0.390	0.443	0.464	0.472		
PAV	0.265	0.525	0.296	0.385	0.393	0.373	0.473	0.308	0.740	

Source: Fieldwork (2023)

It can be observed from Table 9 that the HTMT ratios for the constructs range from 0.143 to 0.856, which are less than the suggested threshold of 0.90 (Henseler et al., 2015). Consequently, discriminant validity has been achieved through the HTMT criterion.

Self-regulated Learning Scale

The collected study data for SRL underwent a Confirmatory Factor Analysis (CFA). Figure 5 illustrates the CFA model for self-regulated learning construct.

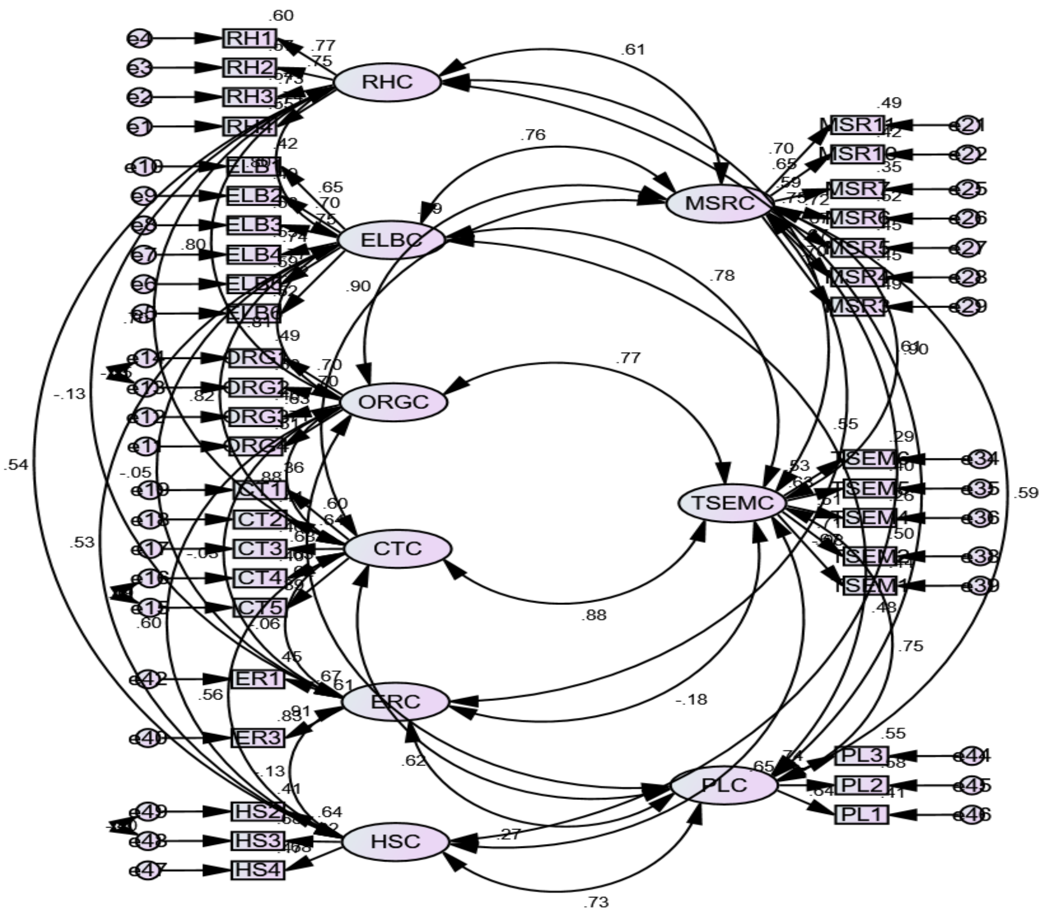


Figure 5: CFA model for Self-regulated learning (SRL) Scale
Source: Fieldwork (2023)

The outcomes derived from the application of the CFA to the SRL construct were computed utilising the Maximum Likelihood (ML) technique. The evaluation of goodness-of-fit indices aims to ascertain the viability of an exact fit (non-significant χ^2) or an approximate fit (SRMR $\leq$ .08) as per the criteria established by Asparouhov and Muthen (2018). This assessment facilitates the scrutiny of loading and AVE for the validation of construct. The results of the goodness-of-fit are presented in Table 10.

Table 10: Goodness of Fit Indices for SRL Scale

Fit Indices	Estimates	Recommended Threshold	Reference
χ^2	2187.570 ($p < .001$)	> .05	Hair et al. (2010)
CMIN/DF	3.300	≤ 2 or 5	Schreiber (2008); Schumacker and Lomax (2015)
CFI	.828	≥ .90	Kline (2013)
NFI	.772	≥ .90	Kline (2013)
IFI	.829	≥ .90	Kline (2013)
TLI	.807	≥ .90	Kline (2013)
RMSEA	.071	≤ .08	Schreiber (2008)
SRMR	.055	≤ .08	Kline (2023)

Source: Fieldwork (2023)

The fit indices, such as the goodness of fit, determine whether an exact fit (χ^2 not significant) or an approximate fit (SRMR ≤ .08) is appropriate for assessing the construct validity of a scale, including the SRL scale for the nine-factor construct. This can be achieved by examining the standardised regression weights (loading) and AVE. The indices indicate that the SRL scale has an approximate fit (SRMR ≤ .08) for the nine-factor construct, and the item loadings, AVE, and reliability are shown in Table 11.

Table 11: Items, Factor Loadings, Reliability and AVE of SRL Scale

Factors/Constructs	No of Items	Items	Factor Loading	α	ω	CR	AVE
Critical Thinking (CT)	5	CT1	.602***	.776	.779	.877	.404
		CT2	.636***				
		CT3	.680***				
		CT4	.635***				
		CT5	.621***				
Elaboration (ELB)	6	ELB1	.646***	.864	.864	.867	.521
		ELB2	.699***				
		ELB3	.751***				
		ELB4	.741***				
		ELB5	.767***				
		ELB6	.720***				
Effort Regulation (ER)	2	ER1	.675***	.761	.761	.779	.643
		ER3	.912***				
Help Seeking (HS)	3	HS2	.640***	.693	.699	.762	.519
		HS3	.825***				
		HS4	.683***				
Metacognitive Self-Regulation (MSR)	7	MSR3	.701***	.852	.853	.853	.453
		MSR4	.668***				
		MSR5	.671***				
		MSR6	.722***				
		MSR7	.593***				
		MSR10	.647***				
		MSR11	.703***				
Organisation (ORG)	4	ORG1	.702***	.763	.767	.782	.474
		ORG2	.704***				
		ORG3	.632***				
		ORG4	.712***				
Planning (PL)	3	PL1	.640***	.754	.759	.758	.512
		PL2	.759***				
		PL3	.742***				
Rehearsal (RH)	4	RH1	.774***	.836	.838	.837	.563
		RH2	.753***				
		RH3	.734***				
		RH4	.739***				
Time and Study Environment Management (TSEM)	5		.667***	.749	.749	.750	.379
		TSEM1					
		TSEM2	.707***				
		TSEM4	.515***				
		TSEM5	.631***				
		TSEM6	.534***				
SRL Scale	39	-	-	.943	.945	-	-

Note: α = Cronbach Alpha; ω = MacDonald Omega; AVE = Average Variance Extracted; CR = Composite Reliability; ***$p < .001$

Source: Fieldwork (2023)

The results presented in Table 11 reveal that the items that displayed low factor loading were consequently eliminated based on Pallant's (2020) recommendation. For instance, items ER2, ER4, HS1, MSR1, MSR2, MRS8, and MSR9 were deleted because of low loadings. It is noteworthy that all regression estimates exhibited statistical significance (Awang, 2014). The calculated α values (e.g., α_{CT} = .776; α_{MSR} = .852; α_{PL} = .754; α_{ELB} = .864), ranging from .693 to .864, surpassed the minimum acceptable threshold of .60 or .70, as suggested by Awang (2014) and Hair et al. (2010). Additionally, the CR values (e.g., CR_{HS} = .762; CR_{ORG} = .782; CR_{TSEM} = .750) exceeded the recommended threshold of .60 or .70 (Hair et al., 2010). Collectively, these results indicate that the internal consistency reliability of the latent constructs is satisfactory. Furthermore, the computed Average Variance Extracted (AVE) values ranged from .379 to .643. This implies that some of the AVE values (e.g., AVE_{TSEM} = .379; AVE_{CT} = .404) were below the recommended threshold of .50 (Kline, 2015). However, in alignment with Fornell and Larcker's (1981) guidelines, when the AVE is below .50 but the CR exceeds 0.60, the convergent validity of the construct remains adequate. Hence, the convergent validity criterion for the construct has been met.

Discriminant Validity for SRL Scale

The discriminant validity for the SRL scale was examined using HTMT criterion. The results for the HTMT ratio is displayed in Table 12.

Table 12: HTMT Analysis

	RH	ELB	ORG	CT	MSR	TSEM	ER	PL	HS
RH									
ELB	0.805								
ORG	0.814	0.827							
CT	0.696	0.813	0.902						
MSR	0.619	0.764	0.791	0.888					
TSEM	0.743	0.794	0.787	0.876	0.893				
ER	0.159	0.057	0.090	0.089	0.105	0.202			
PL	0.594	0.551	0.637	0.632	0.606	0.741	0.304		
HS	0.607	0.585	0.698	0.631	0.524	0.709	0.142	0.794	

Source: Fieldwork (2023)

Table 12 reveals that, with the exception of a singular value surpassing 0.90, the HTMT values associated with the constructs span from 0.089 to 0.893. These values fall below the recommended threshold of 0.90 (Henseler et al., 2015). Consequently, discriminant validity has been achieved through the HTMT criterion.

Academic Engagement Scale

The data utilised for the assessment of academic engagement was subjected to CFA. The CFA model for the academic engagement construct is depicted in Figure 6.

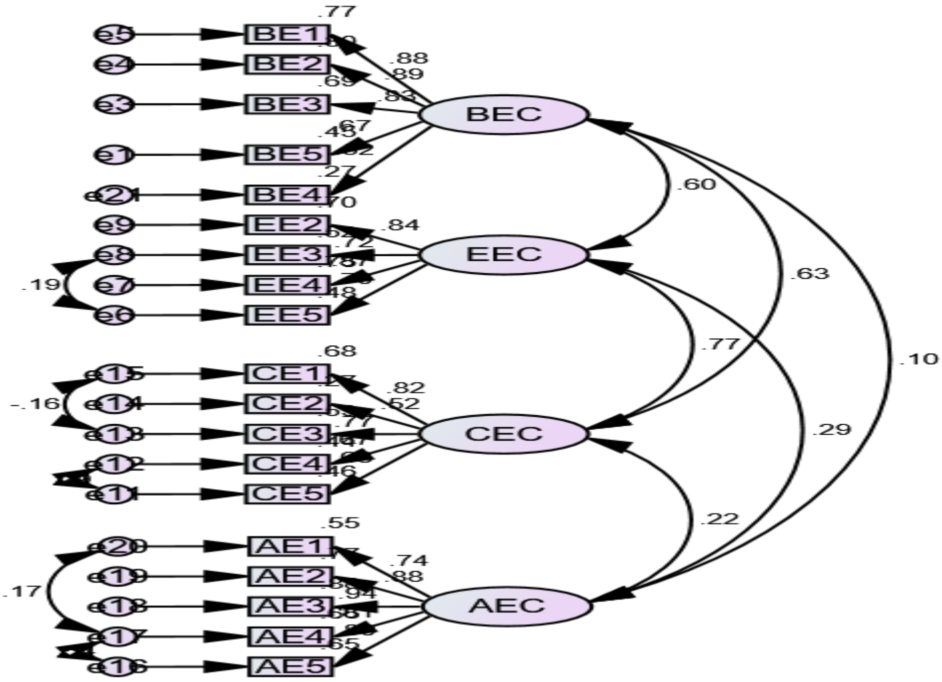


Figure 6: A four-factor CFA model for Academic Engagement (AEG) Scale
Source: Fieldwork (2023)

The results of the CFA for the four-factor AEG scale were computed using the Maximum Likelihood (ML) technique, and the outcomes were ascertained using goodness-of-fit indices. These indices determined the feasibility of an exact fit or an approximate fit (SRMR ≤ .08) based on the criteria set forth by Asparouhov and Muthen (2018). This assessment is crucial for evaluating loading and AVE to establish construct validity. The results of the goodness-of-fit are presented in Table 13.

Table 13: Goodness of Fit Indices for AEG Scale

Fit Indices	Estimates	Recommended Threshold	Reference
χ^2	193.664 (p = .002)	> .05	Hair et al. (2010)
CMIN/DF	1.374	≤ 2 or 3	Schreiber (2008)
CFI	.922	≥ .90	Kline (2013)
NFI	.900	≥ .90	Kline (2013)
IFI	.922	≥ .90	Kline (2013)
TLI	.905	≥ .90	Kline (2013)
RMSEA	.080	≤ .08	Schreiber (2008)
SRMR	.081	≤ .08	Kline (2023)

Source: Fieldwork (2023)

The evaluation of the goodness-of-fit indices, which assess the suitability of an exact or approximate fit (with an SRMR of ≤.08) to determine the validity of the standardised regression weights (i.e., loadings) and AVE for evaluating construct validity, is crucial. These indices indicate that the Academic Engagement Scale exhibits an approximate fit (with an SRMR of ≤.08) for the four-factor AEG construct, as shown in Table 14, which includes the item loadings, AVE, and reliability.

Table 14: Items, Factor Loadings, Reliability and AVE of AEG Scale

Factors/Constructs	No of Items	Items	Factor Loading	α	ω	CR	AVE
Behavioural Engagement (BE)	5	BE1	.877***	.864	.868	.877	.596
		BE2	.895***				
		BE3	.831***				
		BE4	.516***				
		BE5	.674***				
Emotional Engagement (EE)	4	EE2	.838***	.867	.868	.863	.614
		EE3	.722***				
		EE4	.865***				
		EE5	.695***				
Cognitive Engagement (CE)	5	CE1	.823***	.821	.822	.824	.489
		CE2	.523***				
		CE3	.770***				
		CE4	.667***				
		CE5	.677***				
Agentic Engagement (AE)	5	AE1	.741***	.929	.931	.921	.701
		AE2	.879***				
		AE3	.936***				
		AE4	.813***				
		AE5	.804***				
AEG Scale	19	-	-	.903	.887	-	-

Note: BE = Behavioural engagement; EE = Emotional engagement; CE = Cognitive engagement; AE = Agentic engagement; α = Cronbach Alpha; ω = MacDonald Omega; AVE = Average Variance Extracted; CR = Composite Reliability; ***$p < .001$
Source: Fieldwork (2023)

From Table 14, only item EE1 had low factor loading and it was deleted based on the recommendation of Pallant (2020). It can be observed that all the regression estimates were significant (Awang, 2014). The values of α (e.g., α_{BE} = .864; α_{CE} = .821) ranges from .821 to .929 were above the acceptable threshold of .70 and above (Hair et al., 2022). Likewise, composite reliability (CR) values were above the threshold of .60 or .70 (Hair et al., 2010). Hence, the values revealed that there was adequate internal consistency reliability between the latent constructs. Lastly, the values (AVE_{BE} = .596; AVE_{AE} = .701) of the AVE ranged from .489 (approximately .500) to .701 met the recommended threshold of .50 (Hair, Matthews, Matthews & Sarstedt, 2017; Kline, 2023). Thus, convergent validity criterion has been met for the construct.

Discriminant Validity for AEG Scale

The discriminant validity for the AEG scale was examined using HTMT criterion. Table 15 shows the results of the HTMT ratio.

Table 15: HTMT Analysis

	BE	EE	CE	AE
BE				
EE	0.633			
CE	0.652	0.743		
AE	0.220	0.319	0.335	

Note: BE = Behavioural engagement; EE = Emotional engagement; CE = Cognitive engagement; AE = Agentic engagement.
Source: Fieldwork (2023)

Table 15 reveals that the HTMT ratio of the constructs vary between 0.220 and 0.743, all falling below the recommended threshold of .85 as suggested by Henseler et al. (2015). As a result, the fulfillment of discriminant validity is confirmed based on adherence to the HTMT criterion

Lecturer Academic Support Scale

The study data collected for LAS underwent Confirmatory Factor Analysis (CFA). Figure 7 illustrates the CFA model for lecturer academic support construct.

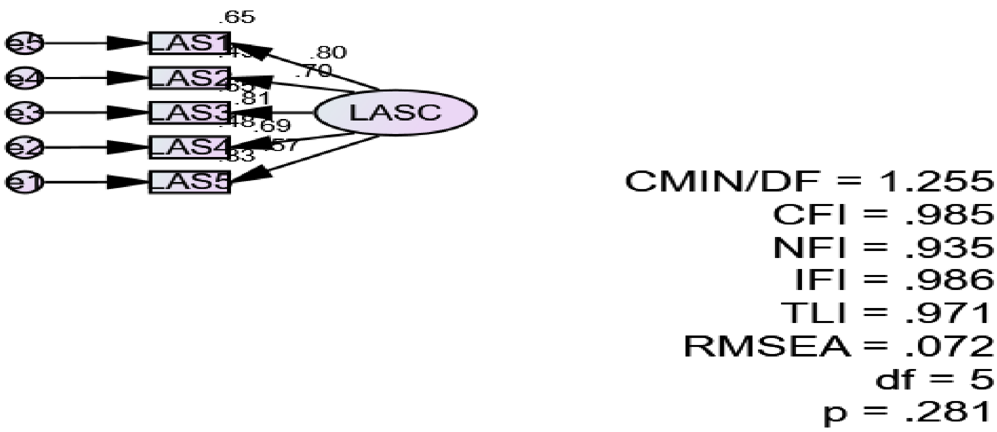


Figure 7: A one-factor CFA model for Lecturer Academic Support (LAS) Scale
Source: Fieldwork (2023)

The estimation of the one-factor LAS scale within the CFA model was performed using the Maximum Likelihood (ML) technique. The assessment of goodness-of-fit indices, as proposed by Asparouhov and Muthen (2018), is necessary to determine the plausibility of an exact or approximate fit (SRMR ≤ .08). This evaluation is essential for examining loading and AVE as indicators of construct validity. The results of the goodness-of-fit analysis are presented in Table 16.

Table 16: Goodness of Fit Indices for LAS Scale

Fit Indices	Estimates	Recommended Threshold	Reference
χ^2	6.273 (p = .281)	> .05	Hair et al. (2010)
CMIN/DF	1.255	≤ 2 or 3	Schreiber (2008)
CFI	.985	≥ .90	Kline (2013)
NFI	.935	≥ .90	Kline (2013)
IFI	.986	≥ .90	Kline (2013)
TLI	.971	≥ .90	Kline (2013)
RMSEA	.072	≤ .08	Schreiber (2008)
SRMR	.0485	≤ .08	Kline (2023)

Source: Fieldwork (2023)

The suitability of fit indices is crucial in determining whether an exact fit or an approximate fit (SRMR ≤ .08) is feasible, as outlined by Asparouhov and Muthen (2018). This approach allows for a thorough examination of standardised regression weights (loadings) and AVE to assess the construct validity. The combined results of all indices suggest that the LAS scale exhibits an approximate fit (SRMR ≤ .08) within the one-factor LAS construct. Table 17 shows the results for item loadings, reliability, and AVE.

Table 17: Items, Factor Loadings, Reliability and AVE of LAS Scale

Factors/Constructs	No. of Items	Items	Factor Loading	α	Ω	CR	AVE
LAS	5	LAS1	.804***	.889	.896	.841	.518
		LAS2	.697***				
		LAS3	.806***				
		LAS4	.691***				
		LAS5	.575***				

Source: Fieldwork (2023)

The regression estimates were found to be statistically significant (Awang, 2014) and no items were deleted because of low factor loadings, as shown in Table 17. Cronbach's α (α_{LAS} = .889); ω (ω_{LAS} = .896) and CR (CR_{LAS} = .841) values were above the acceptable threshold of .70 (Awang, 2014; Hair et al., 2010). The AVE value (AVE_{LAS} = .518) was above the recommended threshold of .50 (Kline, 2015). Hence, convergent validity of the construct was considered adequate. Additionally, there were no concerns regarding discriminant validity as this scale is a latent variable.

Data Collection Procedures

To conduct the study, the necessary data were obtained through a series of steps involving collecting an introductory letter from the Head of the Department of Business and Social Sciences Education. Ethical clearance was obtained from the Institutional Review Board of the University of Cape

Coast's Institutional Review Board (IRB, Ethical Clearance – ID [UCCIRB/CES/2023/154]). The researcher then visited the Department of Business and Social Sciences Education to introduce himself to the lecturers and seek permission to visit the students for data collection during lecture hours. Presenting these documents to instructors of various Economics courses secured support and cooperation.

Once approval was granted, questionnaires were distributed to the students. The assistance of four trained research assistants facilitated communication with the students, and the process involved seeking permission from the lecturers before reaching out to them. During these interactions, the researcher and research assistants explained the purpose of the study, ensured respondents' anonymity, and encouraged active participation. This approach was aimed to establish positive rapport with the respondents and foster cooperation.

The questionnaires were distributed to Economics students and accompanied by clear instructions. The students were given approximately forty (40) to fifty (50) minutes to complete the questionnaire and return it to the research assistants. Each completed questionnaire was reviewed immediately to ensure completeness. If any missing data were identified, the students were informed and requested to provide the necessary information.

Ethical Considerations

Ethical clearance for this study was obtained from the Institutional Review Board (IRB) of the University of Cape Coast (Ethical Clearance - ID [UCCIRB/CES/2023/154]). Also, an introductory letter (see Appendix B) was obtained from the researcher's department to seek permission from appropriate authorities. In order to obtain permission to collect data, the researcher presented the introductory letter and clearance letter to the lecturers in-charge of the Economics courses. The researcher ensured that all ethical guidelines were followed, including obtaining informed consent from all respondents prior to data collection, maintaining confidentiality and anonymity, respecting respondents' autonomy, and avoiding plagiarism.

The consent form (see Appendix D) was presented to the respondents to ensure that they were not coerced or prejudiced. The purpose of the study and the nature of the collected data were clearly explained to them, and assurances of confidentiality and anonymity were provided. Additionally, the respondents were informed that the study was solely for academic purposes, and that their consent would be sought before any data were released to a third party. Finally, they were reminded that they had the right to withdraw from the study at any given time.

The census method was employed to include all Bachelor of Education (social sciences) Economics major students. This method was chosen because the population was manageable and using the entire population minimised the risk of sampling errors. Also, the analysis, interpretation, and presentation of the results were conducted objectively, without any bias.

Data Processing and Analysis

The MO, SRL, AE, and LAS questionnaires were used to collect quantitative data, which were subsequently screened for relevance and completeness. The collected data were coded and entered into Statistical Product for Service Solutions (SPSS 26) for processing purposes. To ensure data accuracy, frequency and percentage analyses were performed, and negatively worded items were reversed coded. For data analysis, the frequency and percentage distributions, mean, and standard deviation were utilised, along with clustered bar graphs. Additionally, two-way MANOVA, structural equation modelling (SEM) using PLS-SEM (Smart-PLS 4) [Ringle, Wende & Becker, 2022] and Covariance-based SEM (CB-SEM, AMOS 24), and artificial neural network (ANN) [machine learning, SPSS version 26] were employed to test the hypotheses at a significance level of 0.05. In the case of 2-way MANOVA, the Bonferroni adjusted alpha level was applied to determine statistical significance.

The analysis of the respondents' characteristics involved the application of frequencies and percentages, and clustered bar graphs. Mean and standard deviation were used to analyse the data pertaining to the three research questions. Additionally, a repeated measures ANOVA was implemented to examine the variations in the self-regulated learning dimensions and academic engagement dimensions regarding research questions two and three. In addition, a 2-way MANOVA was executed to analyse hypotheses one and two, with self-regulated learning and academic engagement dimensions serving as the dependent variables and gender and academic level serving as the independent variables.

The remaining research hypotheses were analysed using structural equation modelling (SEM), a statistical tool deemed appropriate for the nature of the current study. The quantitative portion of the study evaluated the internal consistency, reliability, convergent validity, and discriminant validity of the measurement model. Furthermore, the structural model was assessed by examining collinearity statistics, significance of structural model relationships, coefficient of determination (R^2), effect size (f^2), predictive relevance (Q^2), and predictive power (PLSpredict). SmartPLS software was used to provide model fit statistics, including the standardised root mean square residual (SRMR), Normed Fit Index (NFI), and chi-square, which were used to evaluate the structural model.

The third research hypothesis was examined using Partial Least Squares Structural Equation Modelling (PLS-SEM) with SmartPLS 4 software (Ringle et al., 2022). PLS-SEM was employed for the analysis because it is appropriate for analysing complex interrelationships between constructs and indicators or observed and latent variables (Hair et al., 2022; Hair, Sarstedt, Ringle & Gudergan, 2018, Hair, Binz Astrachan, Moisescu, Radomir, Sarstedt, Vaithilingam & Ringle, 2021; Sarstedt, Hair, Pick, Liengaard, Radomir & Ringle, 2022). Prior empirical studies (e.g., Al-Sharafi et al., 2022; Arpaci et al., 2022; Quan et al., 2024) have advocated for the use of Artificial Neural Network (ANN) in conjunction with PLS-SEM due to the latter's inability to capture non-linear relationships. The ANN approach is more effective than PLS-SEM in detecting both linear and non-linear relationships.

Hypothesis four was analysed using three techniques: PLS-SEM, ANN, and $\mathrm{CB-SEM_{AMOS}}$. This hypothesis aimed at evaluating the impact of self-regulated learning on academic engagement with the additional application of ANN to supplement PLS-SEM outcomes. The effect of the SRL dimensions on academic engagement was also assessed. However, owing to the interconnected nature of the dimensions, the functionalities of SmartPLS software were restricted. Therefore, AMOS, a covariance-based SEM, was used to determine the influence of SRL dimensions on academic engagement.

Finally, the last four research hypotheses were analysed using PLS-SEM. PLS-SEM is recognised as an appropriate statistical tool for evaluating complex structural models (Cheah, Ting, Ramayah, Memon, Cham & Ciavolino, 2019), such as those including higher-order constructs and moderator (Becker, Ringle & Sarstedt, 2018; Becker et al., 2023). The procedure followed in the PLS-SEM approach is displayed by Figure 8.

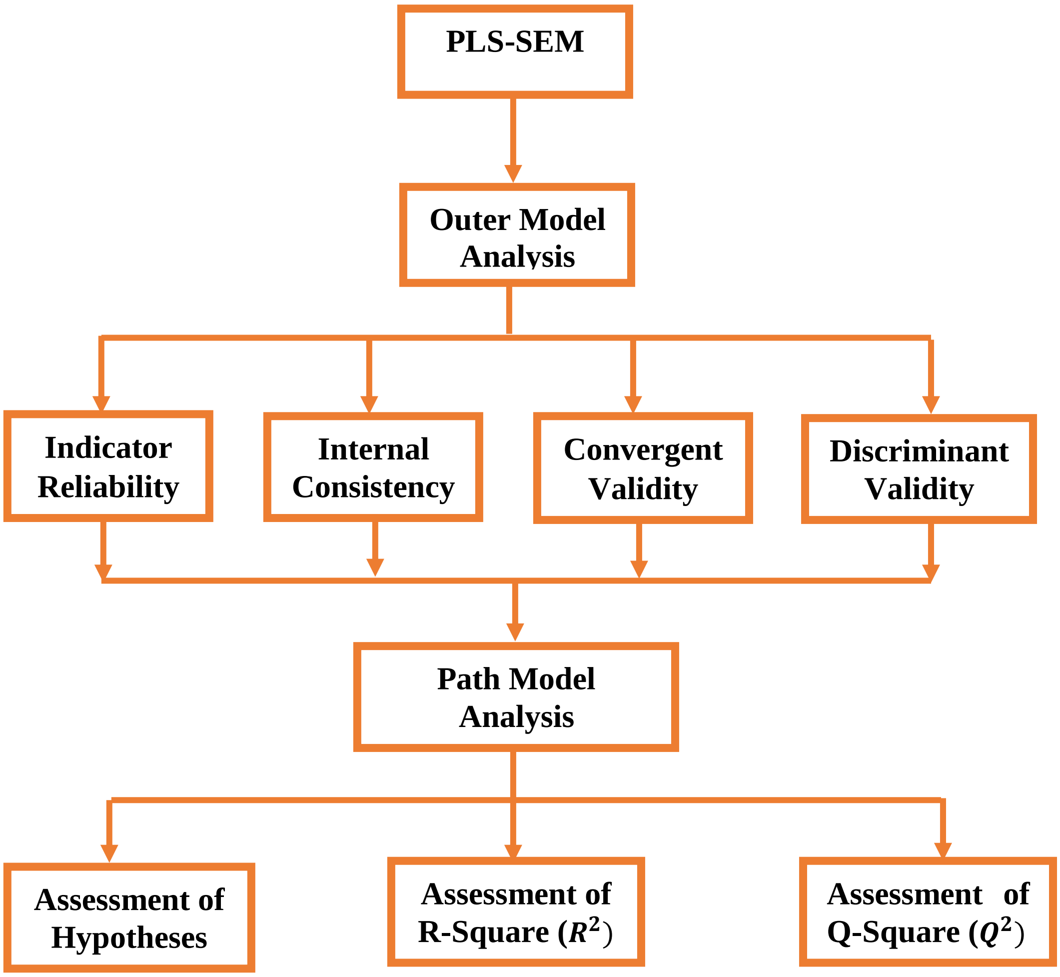


Figure 8: PLS-SEM procedure
Source: Hair, Ringle and Sarstedt (2013)

Additionally, Table 18 provides a summary of the research questions, hypotheses, instrument and analytical techniques.

Table 18: Summary of Data Analysis

Research Questions (RQ)/Research Hypotheses (RH)	Instrument	Analytical Technique
RQ1: What is the level of Economics students' motivational orientations?	MOS	M & SD
RQ2: What is the level of Economics students' self-regulated learning?	SRLS	M & SD, One-Way Repeated Measures ANOVA
RQ3: What is the level of Economics students' academic engagement?	AES	M & SD, One-Way Repeated Measures ANOVA
RH1: H_0: There is no statistically significant difference in Economics students' self-regulated learning based on gender and academic level.	Data from SRLS, Gender and academic Level	Two-Way MANOVA
RH2: H_0: There is no statistically significant difference in Economics students' academic engagement based on gender and academic level.	Data from AES, Gender and academic Level	Two-Way MANOVA
RH3: H_0: There is no statistically significant influence of Economics students' motivational orientations on their self-regulated learning.	Data from MOS and SRLS	PLS-SEM, ANN (Smart-PLS)
RH4: H_0: There is no statistically significant influence of Economics students' self-regulated learning on their academic engagement.	Data from SRLS and AES	PLS-SEM, ANN and CB-SEM (Smart-PLS and AMOS)
RH5: H_0: Levels of Economics students does not moderate the relationship between Economics students' motivational orientations and self-regulated learning.	Data from MOS, LES and SRLS	PLS-SEM (Smart-PLS)
RH6: H_0: Lecturer's academic support does not moderate the relationship between Economics students' self-regulated learning and academic engagement.	Data from SRLS, LASS and AES	PLS-SEM (Smart-PLS)
RH7: H_0: Gender does not moderate the relationship between Economics students' self-regulated learning and academic engagement.	Data from SRLS, Gender and AES	PLS-SEM (Smart-PLS)
RH8: H_0: Undergraduate Economics students' self-regulated learning does not mediate the relationship between their motivational orientations and academic engagement.	Data from SRLS, MOS and AES	PLS-SEM (Smart-PLS)

Note: M = Mean, SD = Standard Deviation
Source: Fieldwork (2023)

Chapter Summary

The study, grounded in positivist philosophy, employed a quantitative research approach and descriptive cross-sectional survey design to examine Economics students' motivational orientations, self-regulated learning, and academic engagement in higher education using SEM ($\mathrm{PLS} - \mathrm{SEM}_{\mathrm{SmartPLS}}$ and $\mathrm{CB} - \mathrm{SEM}_{\mathrm{AMOS}}$) and the ANN approach. The selection of the descriptive cross-sectional design allowed quantitative data to be gathered (through MOS, SRLS, AES and LASS) from the Economics students (N = 497) to examine their levels of motivational orientations, self-regulated learning, and academic engagement. Descriptive statistics (frequency and percentages, mean and standard deviation) and inferential statistics (2-way MANOVA, SEM [PLS-SEM and CB-SEM], and ANN) were used to analyse the gathered data on the research questions and hypotheses. In addition, tables and figures had been used in sections of the study where it was considered appropriate. The subsequent Chapter presents results obtained and discussion to address the research objectives.

CHAPTER FOUR

RESULTS AND DISCUSSION

Overview

In this chapter, the results are presented and discussed to examine the motivational orientations, self-regulated learning, and academic engagement of Economics students in higher education. Quantitative data were collected by administering 497 questionnaires. In accordance with the recommendations of Hair, Hult, Ringle, and Sarstedt (2022), an initial assessment of missing data, outliers, and anomalous patterns was performed. Four hundred and fifty-two (452) respondents completed the questionnaire and no missing or inadmissible data were identified. Consequently, the return rate of the questionnaire was 90.95%. The results and discussion are organised according to their respective research questions and hypotheses to facilitate readers' comprehension.

Normality Test

The distribution-free technique known as PLS-SEM stands out for its flexibility, contrasting with CB-SEM, as it does not necessitate the assumption of normally distributed data (Hair et al., 2022). This characteristic is particularly advantageous for researchers who frequently encounter non-normal data in their studies (Hair, Risher, Sarstedt & Ringle, 2019). Nevertheless, it is crucial to note that in the context of PLS-SEM, highly non-normal data may yield potentially misleading outcomes concerning the statistical significance of parameters (Guenther, Guenther, Ringle, Zaefarian & Cartwright 2023; Hair et al., 2022). Consequently, researchers employing PLS-SEM are advised to evaluate the normality of their data to ensure the robustness of their chosen methodology (Vaithilingam, Ong, Moisescu & Nair, 2024).

Users are encouraged to scrutinise skewness and kurtosis values to assess the normality of data when using PLS-SEM, (Vaithilingam et al., 2024). Hence, in this study, skewness and kurtosis were used to assess the normality of the data. Skewness and kurtosis serve as summary statistics that quantify the degree of deviation from normality, applicable for both descriptive and inferential purposes. According to Hair et al. (2022), skewness values between -2 and +2 are generally considered acceptable. Also, other studies (e.g., Collier, 2020; Kline, 2011) recommended skewness and kurtosis values of ± 3 and ± 10 respectively. Table 19 shows the normality test for the constructs.

Table 19: Normality Test for the Constructs

	N	Skewness		Kurtosis	
Construct/Variable	Statistic	Statistic	SE	Statistic	SE
Intrinsic Goal Orientation	452	-.920	.115	1.265	.229
Extrinsic Goal Orientation	452	-1.268	.115	1.367	.229
Task Value Orientation	452	-1.181	.115	2.042	.229
Control of Learning Beliefs	452	-.835	.115	.851	.229
Academic Self-Efficacy	452	-1.256	.115	2.312	.229
Test Anxiety	452	-.277	.115	-.321	.229
Mastery Approach Goal Orientation	452	-1.225	.115	2.476	.229
Mastery Avoidance Goal Orientation	452	-.957	.115	.408	.229
Performance Approach Goal Orientation	452	-.908	.115	.330	.229
Performance Avoidance Goal Orientation	452	-1.240	.115	1.152	.229
Rehearsal	452	-1.187	.115	1.512	.229
Elaboration	452	-1.273	.115	2.551	.229
Organisation	452	-.995	.115	1.403	.229
Critical Thinking	452	-1.103	.115	2.279	.229
Metacognitive Self-Regulation	452	-1.174	.115	2.160	.229
Time and Study Environment Management	452	-1.250	.115	2.824	.229
Effort Regulation	452	.444	.115	-.793	.229
Peer Learning	452	-.858	.115	.712	.229
Help Seeking	452	-.599	.115	1.337	.229
Self-regulated Learning	452	-.936	.115	1.970	.229
Behavioural Engagement	452	-1.831	.115	4.349	.229
Emotional Engagement	452	-1.168	.115	1.650	.229

Cognitive Engagement	452	-.996	.115	1.641	.229
Agentic Engagement	452	-.559	.115	-.619	.229
Academic Engagement	452	-.843	.115	1.255	.229
Lecturer's Academic Support	452	-.959	.115	.748	.229

Noted: SE = Standard (Std.) Error
Source: Fieldwork (2023)

In Table 19, all skewness values for the constructs range from -1.831 to .444, which are less than the recommended thresholds of -2 and +2 (Hair et al., 2022; Tabachnick & Fidell, 2019). In addition, the kurtosis values (-.793 to 4.349) were less than the threshold recommended by Kline (2011) and Collier (2020). The results indicated that the data were normally distributed. To validate the normality, as indicated by the descriptive statistics, a Quantile-Quantile plot (Q-Q plot) was constructed. The purpose of this plot was to facilitate a visual assessment of the observed data in comparison to an anticipated normal diagonal distribution line. According to Pallant (2020), normality is deemed acceptable when the observed data align closely with or are situated on the expected normal diagonal line derived from a theoretical probability distribution. Figures 9 and 10 illustrate the normality assessment for the constructs of self-regulated learning and academic engagement, respectively.

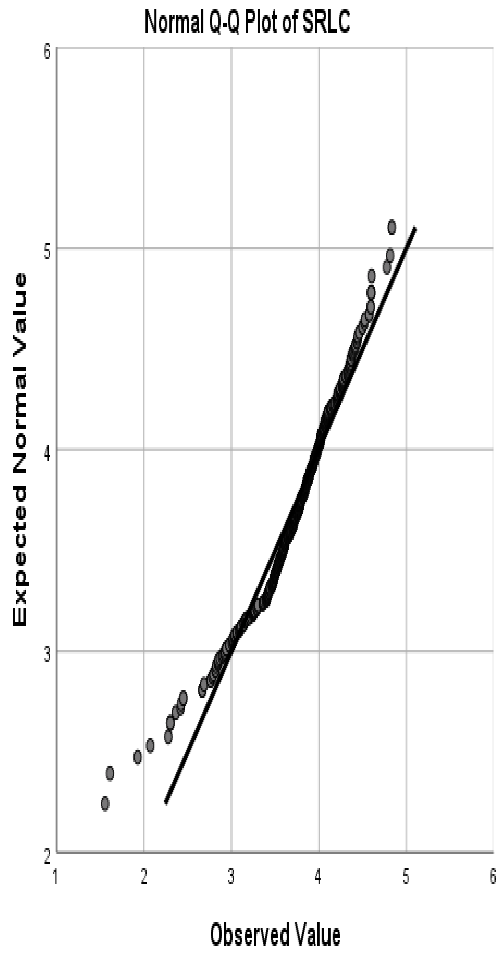


Figure 9: Q-Q plot for self-regulated learning
Source: Fieldwork (2023)

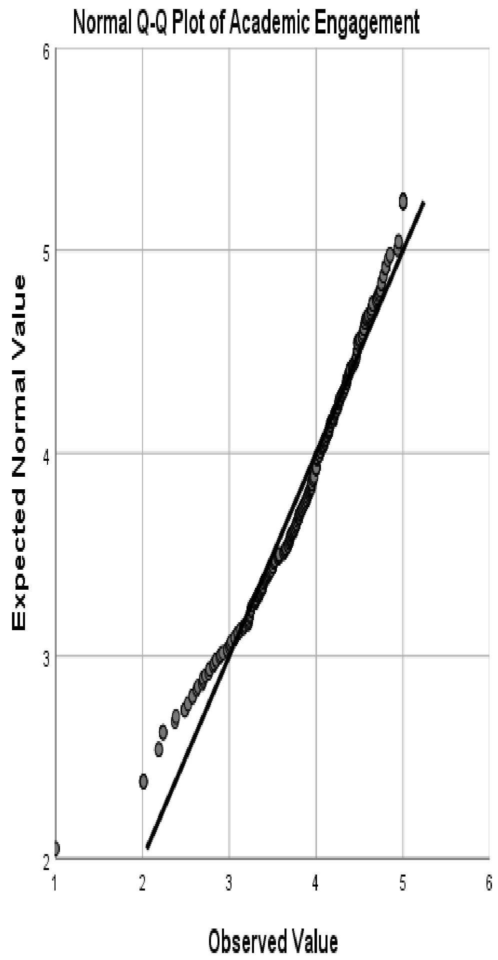


Figure 10: Q-Q plot for academic engagement
Source: Fieldwork (2023)

The Quantile-Quantile plot (Q-Q plot) for self-regulated learning revealed that the observed scores were closely aligned with the diagonal line, exhibiting slight deviations at the tails. Similarly, in the case of academic engagement, the observed scores closely followed the diagonal line, displaying minor deviations at the tails. These observed deviations were not significantly distant from the anticipated normal distribution line, thereby confirming that both variables were approximately normally distributed (Pallant, 2020). The Q-Q plot for the other constructs also showed that normality was achieved (see Appendix E).

Multivariate normality was assessed using Mahalanobis distance (MD), as suggested by Hair, Black, Babin, and Anderson (2010), and Pallant (2020). Hair et al. (2010) recommended that MD should be divided by the number of predictors, and if the values exceed 4, then outliers are present. In this study, all the values were below the threshold of 4. Hence, multivariate normality was achieved. Additionally, an online statistical power analysis tool known as WebPower (Zhang & Yuan, 2018) was utilised to validate both the univariate and multivariate normality. This involved assessing Mardia's multivariate skewness and kurtosis following the suggestion of Richter and Tudoran (2024) [see Appendix F for detailed results].

Demographic Characteristics of Respondents

This section focuses on the demographic characteristics of higher education Economics students. Table 20 shows the demographic profile (e.g., gender, age, and academic level) of the higher education Economics students.

Table 20: Results of Economics Students' Demographic Characteristics

Variable	Subscale	Frequency (*n*)	Percentage (%)
Gender	Male	308	68.1
	Female	144	31.9
Age (in years)	18-20	86	19.0
	21-23	274	60.6
	24-26	67	14.8
	27-29	19	4.2
	30 and Above	6	1.3
Academic Level	100	195	43.1
	200	82	18.1
	300	94	20.8
	400	81	17.9

Note: Age_M = 22.32 (Age_{SD} = 2.31)
Source: Fieldwork (2023)

In Table 20, the number of male Economics students (*n* = 308, 61.1%) was more than twice the number of the females (*n* = 144, 31.9%). This result suggests that the majority of the higher education Economics students were males. The implication of this finding is that within the higher education Economics student population, there is a notable gender imbalance, with a significant majority being male. The fact that male students represent more than twice the number of female students suggests a potential gender disparity in the field of Economics at the higher education level. The higher gender disparity among higher education Economics students in Ghana could be influenced by various factors, including societal expectations, cultural norms, and historical patterns in educational and career choices (Nagaraj, Goh, Cheong, Tey & Jani, 2014; Olson-Strom & Rao, 2020). Traditional gender roles and expectations may steer individuals towards certain fields, and if Economics is perceived as being more aligned with male-oriented professions, it could deter female students from pursuing studies in this discipline.

Additionally, access to educational resources, encouragement from family and teachers, and prevailing stereotypes about gender roles in the workforce may contribute to the observed disparity. For instance, Wang and Degol (2017) observed that gender-related stereotypes and biases are significant factors accounting for gender disparity in subject choices in higher education. Moreover, the results could have broader implications for the diversity and representation within the Economics discipline, highlighting the need for further exploration of the factors that influence these gender imbalances. Addressing such disparities is crucial for fostering inclusivity and ensuring equal opportunities for all students, regardless of gender, in the academic domain of Economics.

With regard to age, the majority (n = 274, 60.6%) of the Economics students were within the age range of 21-23. This age bracket, falling between

15 and 24, is commonly denoted as "youth" or "young adulthood," signifying a significant transitional phase from adolescence to adulthood (Sawyer, Azzopardi, Wickremarathne & Patton, 2018). This suggests that the majority of the Economics students who participated in this study were young adults. This result confirms the dominance of the youth in higher education compared to adult students (Azila-Gbettor & Abiemo, 2020). In all, the Economics students had an average age of 22.32 (Age_{SD} = 2.31). However, less than two per cent (n = 6, 1.3%) of the students were aged ≥ 30 years.

Moreover, the majority (n = 195, 43.1%) of the students were in Level 100, while the minority (n = 81, 17.9%) were in Level 400. This result suggests that most students were in their first year of university studies.

Furthermore, a clustered bar chart was utilised to analyse a combination of academic level and gender, academic level and age categories, and age categories and gender. Figure 11 shows a joint analysis of the academic level and gender of Economics students.

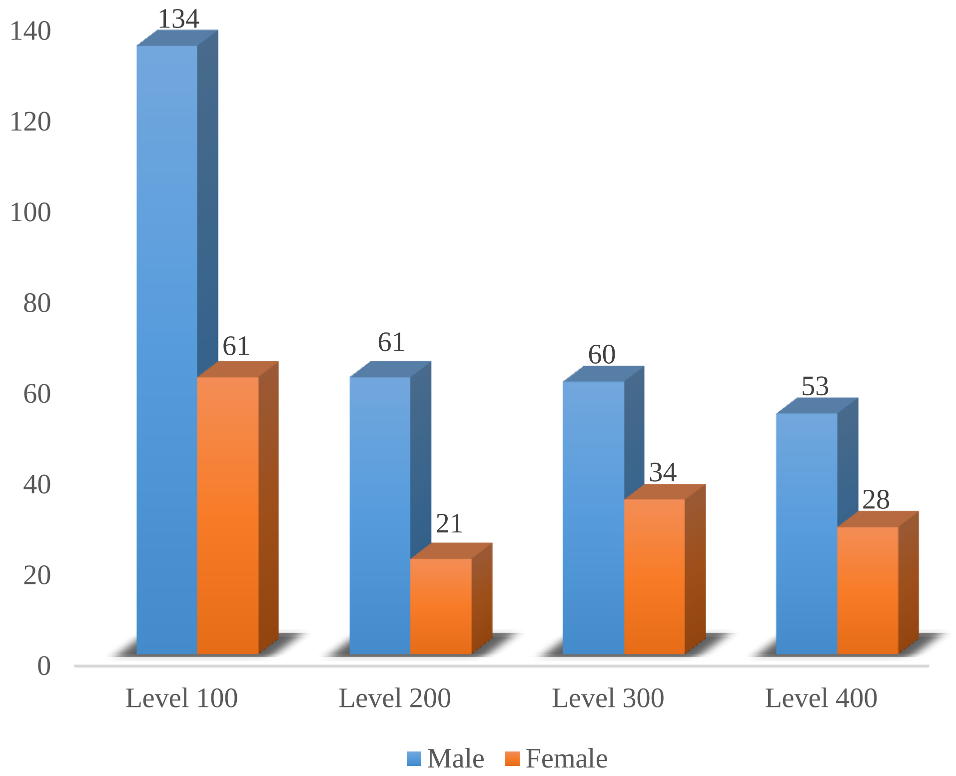


Figure 11: A clustered bar chart for a coordinated analysis of academic level and gender
Source: Fieldwork (2023)

From Figure 11, the results reveal the majority of male (n = 134) and female (n = 61) Economics students are in Level 100. On the contrary, a minority of male students (n = 53) and female students (n = 21) were in Levels 400 and 200, respectively. Figure 12 shows a combined analysis of Economics students' academic level and age.

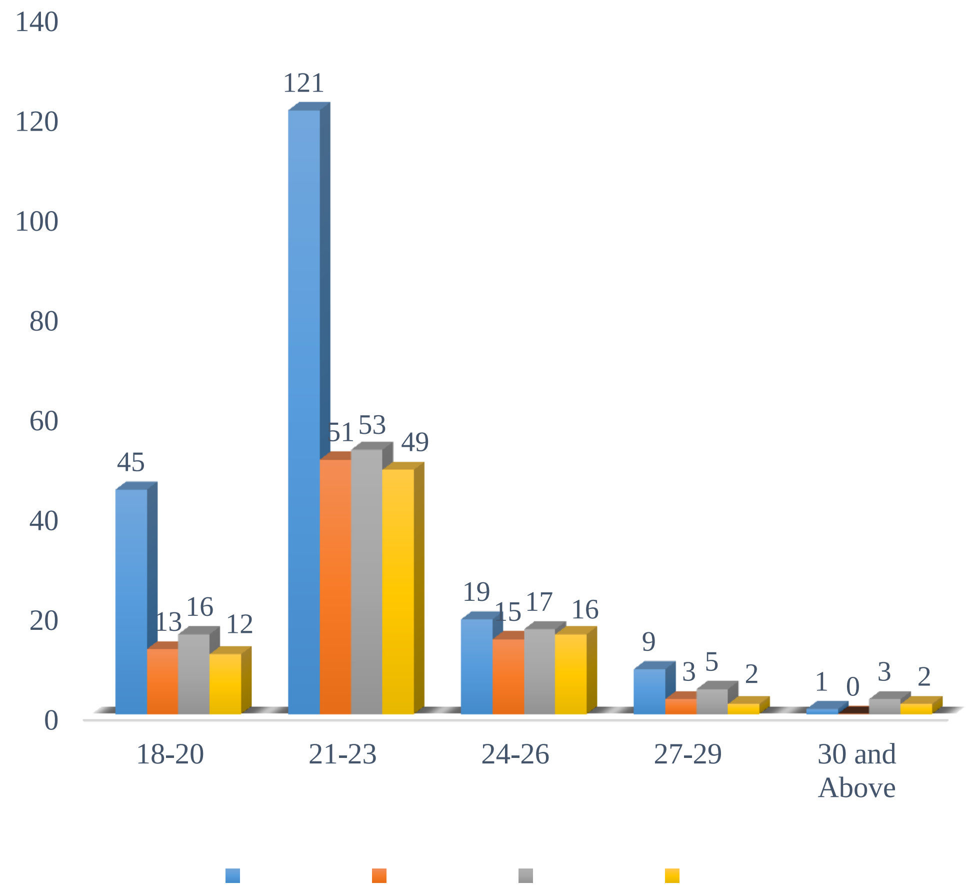


Figure 12: A clustered bar chart for a joint analysis of academic level and age
Source: Fieldwork (2023)

Figure 12 reveals that the majority of Economics students within the age ranges of 18-20 (n = 45), 21-23 (n = 121), and 24-26 (n = 19) are enrolled in Level 100. Surprisingly, none of the Economics students at Level 200 were 30 years or older. Figure 13 shows a joint analysis of Economics students' age and gender.

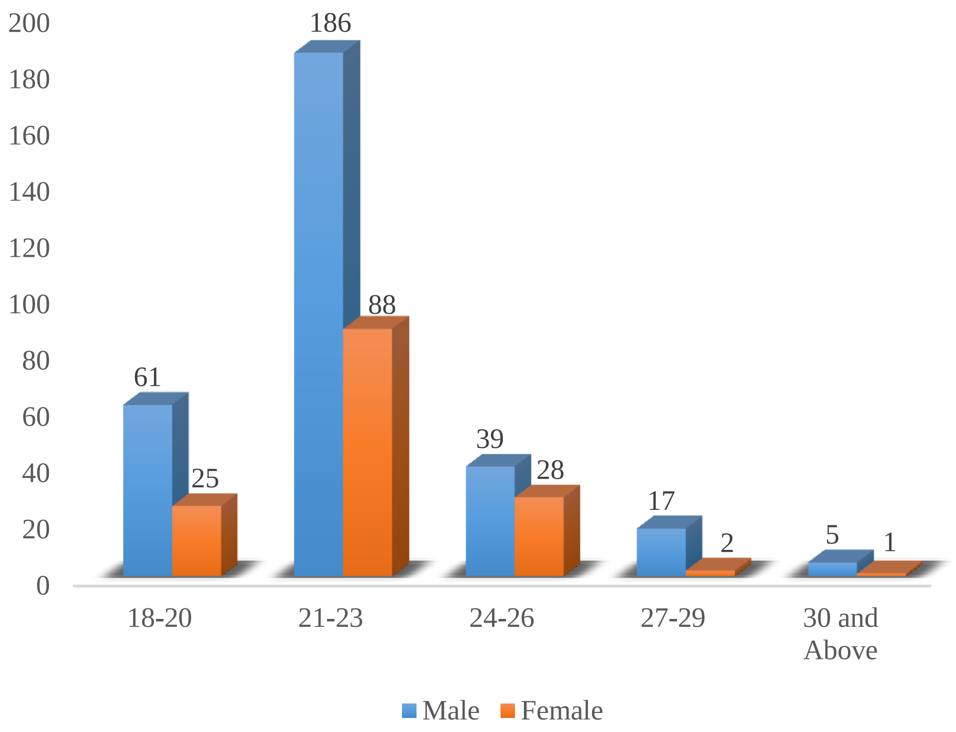


Figure 13: A clustered bar chart for a combined analysis of age and gender
Source: Fieldwork (2023)

In Figure 13, the results indicate that most male Economics students (*n* = 186) and female Economics students (*n* = 88) fall within the age range of 21-23 years. In contrast, a minority of the students who were males (*n* = 5) and females (*n* = 1) were 30 years and above.

Students' Level of Motivational Orientations

Research Question One: What is the Level of Economics Students' Motivational Orientations?

The first research question examined undergraduate Economics students' motivational orientation level. The undergraduate Economics students' level of motivational orientation was examined. This helped to gauge their motivational orientations in the learning of Economics. In order to achieve this objective, the following research question was formulated: What is undergraduate Economics students' level of motivational orientations? The MOS was employed to collect this data. The data were analysed and discussed using mean and standard deviation. Based on the five-point Likert scale, a mean rating of 1.00-1.49 indicates a very low level, 1.50-2.49 indicates a low level, 2.50-3.49 shows a moderate level, 3.50-4.49 indicates a high level and 4.50-5.00 indicates a very high level. The descriptive results are summarised in Table 21 (see Appendix G for detailed results).

Table 21: Economics Students' Level of Motivational Orientations

Motivational Orientations	Mean Scores	*SD*	Interpretation	Rank
Intrinsic Goal Orientation	3.71	1.07	High	9th
Extrinsic Goal Orientation	4.06	1.08	High	2nd
Task Value Orientation	4.02	.94	High	3rd
Control of Learning Beliefs	3.79	1.06	High	6th
Academic Self-Efficacy	3.98	.96	High	4th
Test Anxiety	3.42	1.20	Moderate	10th
Mastery Approach Goal Orientation	4.07	.92	High	1st
Mastery Avoidance Goal Orientation	3.76	1.13	High	7th
Performance Approach Goal Orientation	3.72	1.16	High	8th
Performance Avoidance Goal Orientation	3.95	1.17	High	5th

Scale: 1.00-1.49 (*Very Low*); 1.50-2.49 (*Low*); 2.50-3.49 (*Moderate*); 3.50-4.49 (*High*); 4.50-5.00 (*Very High*).
Source: Fieldwork (2023)

In Table 21, the results showed that Economics students exhibited a high level of mastery approach goal orientation (M = 4.07, SD = .92). The respondents indicated that their goal was to learn as much as possible (M = 4.31, SD = .82) and to completely master the Economics material presented to them in the Economics class (M = 4.08, SD = .92).

Also, extrinsic orientation had the second-highest mean value (M = 4.06, SD = 1.08). This result implies that Economics students' extrinsic orientation is high. For instance, the Economics students confirmed that the most important thing for them is improving their overall grade point average

(*M* = 4.18, *SD* = 1.04), and getting a good grade in the Economics class is the most satisfying thing for them (*M* = 4.12, *SD* = 1.07).

In addition, the results revealed that Economics students had a high level of task value orientation (*M* = 4.06, *SD* = 1.08). Economics students indicated that understanding the subject matter of this Economics course is very important to them (*M* = 4.18, *SD* = .85), and that it is important for them to learn the Economics course material (*M* = 4.06, *SD* = .92).

Moreover, Economics students exhibited a high level of academic self-efficacy (*M* = 3.94, *SD* = .93). For example, the students stated that they expected to do well in the Economics class (*M* = 4.29, *SD* = .87), and they were certain that they could master the skills being taught in the Economics class (*M* = 4.08, *SD* = .91).

Furthermore, the lowest mean value was recorded for test anxiety (*M* = 4.06, *SD* = 1.08). This shows that Economics students had a moderate level of test anxiety. For instance, the students indicated that when they took a test they thought about items on other parts of the test they could not answer (*M* = 3.79, *SD* = 1.02). This was followed by the statement that the respondents affirmed that when they took the tests, they thought of the consequences of failing (*M* = 3.59, *SD* = 1.21).

Economics Students' Level of Self-Regulated Learning

Research Question Two: What is the Level of undergraduate Economics Students' Self-regulated learning?

This research question examined the level of undergraduate Economics students' self-regulated learning. Table 22 presents the descriptive (mean and

SD) results of Economics students' level of self-regulated learning and the comprehensive results can be found in Appendix H.

Table 22: Economics Students' Level of Self-Regulated Learning (SRL)

SRL Dimensions	Mean Scores	*SD*	Interpretation
Rehearsal	3.82	1.03	High
Elaboration	3.93	.93	High
Organisation	3.88	.97	High
Critical Thinking	3.85	.92	High
Metacognitive Self-Regulation	3.94	.93	High
Time and Study Environment Management	3.96	.96	High
Effort Regulation	2.78	1.26	Moderate
Peer Learning	3.80	1.01	High
Help-Seeking	3.81	.99	High
Level of SRL	3.72	1.01	High

Scale: 1.00-1.49 (*Very Low*); 1.50-2.49 (*Low*); 2.50-3.49 (*Moderate*); 3.50-4.49 (*High*); 4.50-5.00 (*Very High*).
Source: Fieldwork (2023)

The results in Table 22 reveal that Economics students exhibited a high level of self-regulated learning (*M* = 3.72, *SD* = 1.01). Specifically, time and study environment management recorded the highest mean value (*M* = 3.96, *SD* = .96), followed by metacognitive self-regulation (*M* = 3.94, *SD* = .93) and elaboration (*M* = 3.93, *SD* = .93).

Concerning time and study environment management, the highest mean value was recorded on the statement that Economics students attended lectures regularly (*M* = 4.32, *SD* = .86). In addition, the students indicated that they usually study in a place where they could concentrate on their Economics coursework (*M* = 4.02, *SD* = .93) [see Appendix D].

Economics students had high levels of metacognitive self-regulation, which was stressed by the indication that when Economics students become confused about something they are reading for Economics class, they go back and try to figure it out (*M* = 4.02, *SD* = .88). The students affirmed that if the

Economics course materials were difficult to understand, they changed the way they read the material (*M* = 3.97, *SD* = .88).

On the contrary, the lowest mean value was recorded by effort regulation (*M* = 2.78, *SD* = 1.26). The results showed that Economics students had moderate level of effort regulation.

Therefore, the results implied that the SRL dimension with the highest mean was time and study environment management. At a significance level of .05, a repeated measures ANOVA was performed to validate this observation. Table 23 shows the results of the repeated measures ANOVA.

Table 23: Repeated ANOVA Tests of Within-Subject Effects for Self-Regulated Learning

Source		Type III Sum of Squares	df	Mean Square	F	p	η_p^2
SRL	Sphericity Assumed	512.791	8	64.099	158.827	<.001	.260
	Greenhouse-Geisser	512.791	3.381	151.671	158.827	<.001	.260
	Huynh-Feldt	512.791	3.410	150.398	158.827	<.001	.260
	Lower-bound	512.791	1.000	512.791	158.827	<.001	.260
Error(SRL)	Sphericity Assumed	1456.109	3608	.404			
	Greenhouse-Geisser	1456.109	1524.806	.955			
	Huynh-Feldt	1456.109	1537.715	.947			
	Lower-bound	1456.109	451.000	3.229			

Note: SRL = Self-regulated learning; η_p^2 = partial eta squared
Source: Fieldwork (2023).

The Mauchly test results revealed a violation of the sphericity assumption, with $\chi2$ (35) = 1502.229, $p < .001$. To address this issue, the Greenhouse-Geisser statistic was applied, as recommended by Field (2018) and Pallant (2020), to adjust the degrees of freedom. Subsequently, by utilising the Greenhouse-Geisser corrected sphericity estimate, the results demonstrate statistically significant variations in the means scores of the SRL factors, F (3.381, 1524.806) = 158.827, p < .001, η_p^2 = .260. Further substantiating this observation, the partial eta squared value (η_p^2 = .260) suggests a large difference, aligning with Cohen's (1988) effect size guidelines, where an eta-squared of 0.14 is considered a large effect (Cohen, 1988). In Table 24, the Bonferroni pairwise comparison result supports ranking the self-regulated learning dimensions.

Table 24: Pairwise Comparisons of Self-Regulated Learning Dimensions

(I) SRL	(J) SRL	Mean Difference (I-J)	S.E.	p	95% Confidence Interval for Difference LLCI	ULCI
1	2	-.108*	.030	.011	-.204	-.013
	3	-.062	.032	1.000	-.164	.039
	4	-.030	.034	1.000	-.140	.079
	5	-.125*	.036	.018	-.240	-.010
	6	-.144*	.033	.001	-.251	-.037
	7	1.037*	.070	<.001	.811	1.263
	8	.021	.040	1.000	-.109	.150
	9	.308*	.039	<.001	.182	.433
2	1	.108*	.030	.011	.013	.204
	3	.046	.028	1.000	-.044	.136
	4	.078	.027	.135	-.008	.164
	5	-.017	.028	1.000	-.105	.072
	6	-.036	.028	1.000	-.127	.054
	7	1.145*	.064	<.001	.938	1.352
	8	.129*	.038	.031	.005	.253
	9	.416*	.036	<.001	.301	.530
3	1	.063	.032	1.000	-.039	.164
	2	-.046	.028	1.000	-.136	.044
	4	.032	.026	1.000	-.052	.117
	5	-.063	.029	1.000	-.155	.030
	6	-.082	.030	.256	-.179	.016
	7	1.100*	.066	<.001	.888	1.311
	8	.083	.038	.993	-.038	.205
	9	.370*	.036	<.001	.256	.484
4	1	.030	.034	1.000	-.079	.140
	2	-.078	.027	.135	-.164	.008
	3	-.032	.026	1.000	-.117	.052
	5	-.095*	.024	.002	-.171	-.019
	6	-.114*	.026	<.001	-.197	-.031
	7	1.067*	.063	<.001	.863	1.271
	8	.051	.036	1.000	-.065	.167
	9	.338*	.034	<.001	.229	.446
5	1	.125*	.036	.018	.010	.240

Table 24: Cont'd

	2	.017	.028	1.000	-.072	.105
	3	.063	.029	1.000	-.030	.155
	4	.095*	.024	.002	.019	.171
	6	-.019	.024	1.000	-.097	.059
	7	1.162*	.064	<.001	.955	1.369
	8	.146*	.036	.002	.029	.263
	9	.433*	.035	<.001	.320	.545
6	1	.144*	.033	.001	.037	.251
	2	.036	.028	1.000	-.054	.127
	3	.082	.030	.256	-.016	.179
	4	.114*	.026	<.001	.031	.197
	5	.019	.024	1.000	-.059	.097
	7	1.181*	.066	<.001	.968	1.394
	8	.165*	.034	<.001	.056	.274
	9	.452*	.032	<.001	.349	.555
7	1	-1.037*	.070	<.001	-1.263	-.811
	2	-1.145*	.064	<.001	-1.352	-.938
	3	-1.100*	.066	<.001	-1.311	-.888
	4	-1.067*	.063	<.001	-1.271	-.863
	5	-1.162*	.064	<.001	-1.369	-.955
	6	-1.181*	.066	<.001	-1.394	-.968
	8	-1.016*	.073	<.001	-1.250	-.783
	9	-.730*	.058	<.001	-.916	-.543
8	1	-.021	.040	1.000	-.150	.109
	2	-.129*	.038	.031	-.253	-.005
	3	-.083	.038	.993	-.205	.038
	4	-.051	.036	1.000	-.167	.065
	5	-.146*	.036	.002	-.263	-.029
	6	-.165*	.034	<.001	-.274	-.056
	7	1.016*	.073	<.001	.783	1.250
	9	.287*	.035	<.001	.173	.401
9	1	-.308*	.039	<.001	-.433	-.182
	2	-.416*	.036	<.001	-.530	-.301
	3	-.370*	.036	<.001	-.484	-.256
	4	-.338*	.034	<.001	-.446	-.229
	5	-.433*	.035	<.001	-.545	-.320
	6	-.452*	.032	<.001	-.555	-.349
	7	.730*	.058	<.001	.543	.916
	8	-.287*	.035	<.001	-.401	-.173

Note: SRL = Self-regulated learning; 1 = Rehearsal; 2 = Elaboration; 3 = Organisation; 4 = Critical thinking; 5 = Metacognitive self-regulation; 6 = Time and study environment management; 7 = Effort regulation; 8 = Peer learning; 9 = Help seeking; S.E. = Standard error; LLCI = lower limit confidence intervals; ULCI = upper limit confidence intervals.
Source: Fieldwork (2023).

From Table 24, time and study environment management (6) is statistically higher than rehearsal (1), critical thinking (4), effort regulation (7), peer learning (8) and help seeking (9). This result suggests that time and study environment is higher than rehearsal, critical thinking, effort regulation, peer learning and help-seeking.

Economics Students' Level of Academic Engagement

Research Question Three: What is the Level of Economics Students' Academic Engagement?

The undergraduate Economics students' level of academic engagement was examined. This helped to gauge their academic engagement in learning economics. In order to achieve this objective, the following research question was formulated: What is undergraduate Economics students' level of academic engagement? The academic engagement scale (AES) was employed to collect this data. The data were analysed and discussed using mean and standard deviation. The summarised descriptive results are presented in Table 25, and the detailed results can be found in Appendix I.

Table 25: Economics Students' Level of Academic Engagement

Academic Engagement Dimensions	Mean Scores	*SD*	Interpretation
Behavioural Engagement (BE)	4.22	.94	High
Emotional Engagement (EE)	3.97	.96	High
Cognitive Engagement (CE)	4.08	.88	High
Agentic Engagement (AE)	3.39	1.28	Moderate
Level of Academic Engagement	3.92	1.02	High

Scale: 1.00-1.49 (*Very Low*); 1.50-2.49 (*Low*); 2.50-3.49 (*Moderate*); 3.50-4.49 (*High*); 4.50-5.00 (*Very High*).
Source: Fieldwork (2023)

Generally, the results in Table 25 show that the academic engagement of Economics students was notably high (M = 3.92, SD = 1.02). This was stimulated by high behavioural engagement (M = 4.22, SD = .94), high emotional engagement (*M* = 3.97, *SD* = .96), high cognitive engagement (*M* = 4.08, *SD* = .88) and moderate agentic engagement (*M* = 3.39, *SD* = 1.28).

Also, it can be observed from Table 25 that the academic engagement dimension that recorded the highest mean (*M* = 4.22, *SD* = .94) was behavioural engagement. Concerning behavioural academic engagement, the students indicated that they follow rules and regulations in the Economics class (*M* = 4.37, *SD* = .86) and usually do their assignments on time (*M* = 4.30, *SD* = .88).

With regard to emotional engagement, the students stated that Economics classroom is an interesting place to be (*M* = 4.05, *SD* = .91) and they are interested in the Economics course work (*M* = 4.00, *SD* = .93).

In summary, the level of academic engagement of economics students was high in all the defining academic engagement dimensions except for agentic engagement. The means of the academic engagement factors suggested that they had high level of behavioural academic engagement (*M* = 4.22, *SD* = .94) as compared with emotional engagement (*M* = 3.97, *SD* = .96), cognitive engagement (*M* = 4.08, *SD* = .88) and agentic engagement (*M* = 3.39, *SD* = 1.28). Making simplistic and broad assertions about these mean differences appears unfeasible, primarily due to the ambiguity surrounding their statistical significance. Therefore, a one-way repeated-measures ANOVA was performed, and the results are detailed in Table 26.

Table 26: Repeated ANOVA Tests of Within-Subject Effects for Academic Engagement

Source		Type III Sum of Squares	df	Mean Square	F	*p*	η_p^2
AEG	Sphericity Assumed	181.693	3	60.564	127.979	<.001	.221
	Greenhouse-Geisser	181.693	2.019	90.011	127.979	<.001	.221
	Huynh-Feldt	181.693	2.028	89.606	127.979	<.001	.221
	Lower-bound	181.693	1.000	181.693	127.979	<.001	.221
Error(AEG)	Sphericity Assumed	640.289	1353	.473			
	Greenhouse-Geisser	640.289	910.378	.703			
	Huynh-Feldt	640.289	914.490	.700			
	Lower-bound	640.289	451.000	1.420			

Note: AEG = Academic engagement; η_p^2 = partial eta squared
Source: Fieldwork (2023).

The Mauchly's test indicated that the assumption of sphericity had been violated, with $\chi 2$ (5) = 310.772, p < .001. The Greenhouse-Geisser statistic was used to correct the degrees of freedom based on the recommendation of Pallant (2021). Hence, using the Greenhouse-Geisser corrected estimate of sphericity, the results reveal that the mean scores for the AEG factors were statistically significantly different, F (2.109, 910.378) = 127.979, p < .001, η_p^2 = .221. Further substantiating this observation, the partial eta squared value (η_p^2 = .221) suggests a large difference, in line with Cohen's (1988) effect size guidelines. An eta squared of 0.14 is considered a large effect (Cohen, 1988). In Table 27, the Bonferroni pairwise comparison result supports ranking the academic engagement dimensions.

Table 27: Pairwise Comparisons of Academic Engagement Dimensions

(I) AEG	(J) AEG	Mean Difference (I-J)	S.E.	*p*	95% Confidence Interval for Difference	
					LLCI	ULCI
1	2	.246*	.035	<.001	.153	.339
	3	.138*	.032	<.001	.052	.224
	4	.832*	.058	<.001	.678	.985
2	1	-.246*	.035	<.001	-.339	-.153
	3	-.108*	.031	.003	-.190	-.026
	4	.586*	.056	<.001	.438	.735
3	1	-.138*	.032	<.001	-.224	-.052
	2	.108*	.031	.003	.026	.190
	4	.694*	.053	<.001	.553	.835
4	1	-.832*	.058	<.001	-.985	-.678
	2	-.586*	.056	<.001	-.735	-.438
	3	-.694*	.053	<.001	-.835	-.553

Note: AEG = Academic engagement; 1 = Behavioural engagement; 2 = Emotional engagement; 3 = Cognitive engagement; 4 = Agentic engagement; S.E. = Standard error; LLCI = lower limit confidence intervals; ULCI = upper limit confidence intervals.
Source: Fieldwork (2023).

It can be observed from Table 27 that behavioural engagement (1) is statistically higher than emotional engagement (2), cognitive engagement (3) and agentic engagement (4). Also, a significant disparity is evident between emotional engagement (2) and cognitive engagement (3). Consequently, it can be inferred that Economics students exhibit a higher level of BE compared to their EE, CE and AE.

Differences in Self-Regulated Learning based on Gender and Academic Level

Research Hypothesis One

The first research hypothesis determined whether there are any statistically significant differences in undergraduate Economics students' self-regulated learning based on their gender and academic level. The 2-way factorial MANOVA was utilised because the independent variables (gender and academic level) in this hypothesis are two and the dependent variable (self-regulated learning [SRL]) has nine dimensions.

The MANOVA test was conducted subsequent to establishing correlations among the domains of SRL. MANOVA is deemed inefficient when dependent variables lack correlation; thus, it is imperative to establish correlation (Tabachnick & Fidell, 2019). Also, it is recommended that, in MANOVA, the correlation between dependent variables should not surpass .90 (Grice & Iwasaki, 2008). The correlation outcomes among the dependent variables (RH, ELB, ORG, CT, MSR, TSEM, ER, PL, and HS) are presented in Table 28.

Table 28: Correlation Matrix for Dimensions of SRL

	RH	ELB	ORG	CT	MSR	TSEM	ER	PL	HS
RH	1								
ELB	.684**	1							
ORG	.650**	.673**	1						
CT	.559**	.666**	.693**	1					
MSR	.521**	.654**	.637**	.722**	1				
TSEM	.587**	.637**	.596**	.668**	.712**	1			
ER	-.127**	-.046	-.068	-.068	-.087	-.158**	1		
PL	.472**	.447**	.482**	.483**	.487**	.556**	-.231**	1	
HS	.348**	.321**	.356**	.318**	.285**	.406**	.048	.459**	1

Note: RH = rehearsal; ELB = elaboration; ORG = organisation; CT = critical thinking; MSR = metacognitive self-regulation; TSEM = time and study environment management; ER = effort regulation; PL = peer learning; and HS = help seeking; ***p* < .001
Source: Fieldwork (2023)

Table 28 reveals that there are substantial correlations among the dependent variables, which justifies the utilisation of MANOVA to discern the variations in Economics students' self-regulated learning based on their gender and academic level. Table 29 presents descriptive statistics that provide insights into the differences in Economics students' SRL based on the two demographic characteristics. Additionally, Table 29 provides a comprehensive overview of Economics students' SRL, including their mean and standard deviation, which can aid in further analysis and decision-making.

Table 29: Descriptive Statistics for the Dimensions of SRL based on Gender and Academic Level

Dimensions of SRL	Variable	*M*	*SD*
	Gender		
RH	Male	3.84	.82
	Female	3.78	.88
ELB	Male	3.93	.70
	Female	3.91	.77
ORG	Male	3.88	.75
	Female	3.88	.73
CT	Male	3.90	.67
	Female	3.74	.65
MSR	Male	3.96	.66
	Female	3.90	.71
TSEM	Male	4.00	.67
	Female	3.89	.71
ER	Male	2.73	1.12
	Female	2.90	1.15
PL	Male	3.84	.79
	Female	3.71	.90
HS	Male	3.49	.53
	Female	3.56	.60
	Academic Level		
RH	100	3.75	.85
	200	3.87	.85
	300	3.91	.89
	400	3.82	.77
ELB	100	3.81	.74
	200	4.12	.70
	300	3.97	.81
	400	3.95	.54
ORG	100	3.77	.78
	200	4.13	.54
	300	3.96	.82
	400	3.81	.70
CT	100	3.79	.66
	200	4.08	.48
	300	3.78	.80
	400	3.84	.62
MSR	100	3.91	.69
	200	4.12	.47
	300	3.91	.77
	400	3.88	.72

Table 29: Cont'd

TSEM	100	3.93	.73
	200	4.11	.48
	300	3.93	.73
	400	3.91	.65
ER	100	2.59	1.08
	200	2.93	1.17
	300	2.84	1.14
	400	3.02	1.13
PL	100	3.77	.83
	200	3.98	.75
	300	3.72	.88
	400	3.77	.79
HS	100	3.45	.49
	200	3.66	.49
	300	3.46	.56
	400	3.58	.71

Note: RH = rehearsal; ELB = elaboration; ORG = organisation; CT = critical thinking; MSR = metacognitive self-regulation; TSEM = time and study environment management; ER = effort regulation; PL = peer learning; and HS = help seeking.
Source: Fieldwork (2023)

In Table 29, it appears that Economics students who are males recorded highest mean on the SRL dimensions as compared to females. Also, it seems that Economics students who are in Level 200 have higher mean recorded on their time and study environment management (*M* = 4.11, *SD* = .48), elaboration (*M* = 4.12, *SD* = .70), organisation (*M* = 4.13, *SD* = .54), critical thinking (*M* = 4.08, *SD* = .48), metacognitive self-regulation (*M* = 4.12, *SD* = .47), planning (*M* = 3.98, *SD* = .75) and help seeking (*M* = 3.66, *SD* = .49) than those in levels 100, 300 and 400.

Also, Levene's test of equality of error variances showed that the variances were assumed to be equal (see Appendix J). Table 30 shows the results of differences in Economics students' SRL based on their gender and academic level.

Table 30: Differences in Students' SRL Based on Gender and Academic Level

Effect		Value	F	Hypothesis df	Error df	p	η_p^2
Intercept	V	.982	2695.054	9.000	436.000	.000	.982
Gender	V	.046	2.352	9.000	436.000	.013	.046
LES	V	.100	1.686	27.000	1314.000	.016	.033
G * LES	V	.071	1.179	27.000	1314.000	.241	.024

Note: Box's M = 727.621, F(315, 59930.753) = 2.099, $p < .001$; V = Pillai's Trace; G = Gender; LES = Level of Economics students; η_p^2 = Partial Eta Squared; Significance at .05 level
Source: Fieldwork (2023)

The results of the Box's M test assessing the equality of homogeneity of variance-covariance matrices indicated statistical significance (M = 727.621, F(315, 59930.753) = 2.099, $p < .001$). Consequently, the assumption of equal homogeneity of variance-covariance was found to be violated. According to Tabachnick and Fidell (2019), a significance value less than .001 indicates a violation of the assumption. To address this violation, Pallant (2020) recommended the utilisation of Pillai's Trace (V). Hence, Pillai's Trace test was employed to examine statistical significance. Pallant (2020) asserted that Pillai's Trace demonstrates greater robustness in situations where the assumption has been violated. From Table 30, the results reveal that there are statistically significant differences in Economics students' self-regulated learning based gender (main effect), F (9, 436.000) = 2.352, p = .013; V = .046, η_p^2 = .046; and academic level (main effect), F (27, 1314.000) = 1.686, p = .016; V = .100, η_p^2 = .033. Conversely, no significance was observed at the two-level interaction (gender and academic level [G*LES]) [F (27, 1314.000) = 1.179, p = .241 > .05; V = .071, η_p^2 = .024].

Pallant (2020) recommended employing the Bonferroni adjustment to ascertain the significance level due to the distinct analyses at the univariate level. Therefore, the initial p-value of .05 underwent division by the number of dependent variables, yielding .05/9 = .0055, approximately equal to .006. Significance is attributed to results only when the p-value is less than .006. Univariate results are detailed in Table 31.

Table 31: Test of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	Df	Mean Square	F	p	η_p^2
Corrected Model	RH	2.476	7	.354	.495	.839	.008
	ELB	6.525	7	.932	1.808	.084	.028
	ORG	9.865	7	1.409	2.597	.012	.039
	CT	8.858	7	1.265	2.946	.005	.044
	MSR	4.223	7	.603	1.313	.242	.020
	TSEM	6.168	7	.881	1.932	.063	.030
	ER	19.378	7	2.768	2.211	.032	.034
	PL	7.988	7	1.141	1.699	.107	.026
	HS	6.098	7	.871	2.910	.006	.044
Intercept	RH	4968.927	1	4968.927	6948.795	.000	.940
	ELB	5335.950	1	5335.950	10349.938	.000	.959
	ORG	5189.742	1	5189.742	9563.814	.000	.956
	CT	5007.242	1	5007.242	11658.770	.000	.963
	MSR	5289.259	1	5289.259	11508.029	.000	.963
	TSEM	5304.839	1	5304.839	11630.627	.000	.963
	ER	2795.824	1	2795.824	2232.885	.000	.834
	PL	4865.584	1	4865.584	7244.539	.000	.942
	HS	4282.912	1	4282.912	14307.045	.000	.970
Gender	RH	.348	1	.348	.487	.486	.001
	ELB	.011	1	.011	.022	.882	.000
	ORG	.021	1	.021	.040	.842	.000
	CT	1.956	1	1.956	4.554	.033	.010
	MSR	.074	1	.074	.161	.689	.000
	TSEM	.504	1	.504	1.104	.294	.002
	ER	2.551	1	2.551	2.038	.154	.005
	PL	.635	1	.635	.946	.331	.002
	HS	1.226	1	1.226	4.094	.044	.009
LES	RH	1.748	3	.583	.815	.486	.005
	ELB	5.642	3	1.881	3.648	.013	.024
	ORG	4.411	3	1.470	2.709	.045	.018
	CT	2.850	3	.950	2.212	.086	.015
	MSR	1.991	3	.664	1.444	.229	.010
	TSEM	.947	3	.316	.692	.557	.005
	ER	12.191	3	4.064	3.246	.022	.021
	PL	1.448	3	.483	.719	.541	.005
	HS	3.275	3	1.092	3.647	.013	.024
G * LES	RH	.095	3	.032	.044	.988	.000
	ELB	.823	3	.274	.532	.660	.004
	ORG	1.578	3	.526	.969	.407	.007
	CT	1.452	3	.484	1.127	.338	.008

Table 31: Cont'd

	MSR	.873	3	.291	.633	.594	.004
	TSEM	2.937	3	.979	2.147	.094	.014
	ER	2.706	3	.902	.720	.540	.005
	PL	3.437	3	1.146	1.706	.165	.011
	HS	2.238	3	.746	2.492	.060	.017
Error	RH	317.494	444	.715			
	ELB	228.906	444	.516			
	ORG	240.934	444	.543			
	CT	190.690	444	.429			
	MSR	204.069	444	.460			
	TSEM	202.513	444	.456			
	ER	555.938	444	1.252			
	PL	298.200	444	.672			
	HS	132.914	444	.299			
Total	RH	6908.938	452				
	ELB	7203.222	452				
	ORG	7057.250	452				
	CT	6893.160	452				
	MSR	7236.041	452				
	TSEM	7305.320	452				
	ER	4071.000	452				
	PL	6823.444	452				
	HS	5709.313	452				
Corrected Total	RH	319.971	451				
	ELB	235.431	451				
	ORG	250.799	451				
	CT	199.549	451				
	MSR	208.292	451				
	TSEM	208.681	451				
	ER	575.316	451				
	PL	306.188	451				
	HS	139.013	451				

Note: RH = rehearsal; ELB = elaboration; ORG = organisation; CT = critical thinking; MSR = metacognitive self-regulation; TSEM = time and study environment management; ER = effort regulation; PL = peer learning; and HS = help seeking; Bonferroni Adjustment at $p < .006$ (0.05/9)
Source: Fieldwork (2023)

In Table 31, the corrected models for SRL dimensions were not statistically significant except for critical thinking, $F(7, 444) = 2.946$, $p = .005 < .006$; and help seeking, $F(7, 444) = 2.910$, $p = .006$; were statistically significant. However, no significant differences were found in Economics students' self-regulated learning for the main effects (gender, academic level) and the two-level interaction effect (gender*academic level [G*LES]).

Differences in Academic Engagement based on Gender and Academic Level

Research Hypothesis Two

This research hypothesis was meant to determine the differences in undergraduate Economics students' academic engagement based on gender and academic level. The differences in academic engagement based on gender and academic level was examined through a 2-way factorial MANOVA. The 2-way factorial MANOVA was used because the independent variables (gender and academic level) in this hypothesis are two and the dependent variable (academic engagement) has four dimensions. In addition, the correlation between the dependent variables were examined prior to conducting the MANOVA (Grice & Iwasaki, 2008; Tabachnick & Fidell, 2019). Table 32 shows correlation matrix for the dimensions of academic engagement (AEG).

Table 32: Correlation Matrix for Dimensions of AEG

Variables	BE	EE	CE	AE
BE	1			
EE	.550**	1		
CE	.546**	.623**	1	
AE	.199**	.286**	.301**	1

Note: BE = behavioural engagement, EE = emotional engagement; CE = cognitive engagement; AE = agentic engagement; ***p* < .001
Source: Fieldwork (2023)

Table 32 shows that the correlations among the dependent variables are significant. Thus, MANOVA was used to determine the differences in Economics students' academic engagement based on gender and academic level. Table 33 shows the descriptive statistics for Economics students' academic engagement based on gender and academic level.

Table 33: Descriptive Statistics for AEG dimensions based on Gender and Academic Level

Dimensions of AEG	Variable	*M*	*SD*
	Gender		
BE	Male	4.23	.79
	Female	4.20	.70
EE	Male	3.99	.85
	Female	3.95	.74
CE	Male	4.09	.66
	Female	4.06	.70
AE	Male	3.48	1.13
	Female	3.19	1.13
	Academic Level		
BE	100	4.07	.87
	200	4.60	.40
	300	4.20	.74
	400	4.21	.62
EE	100	3.99	.88
	200	3.92	.86
	300	4.00	.74
	400	3.95	.65
CE	100	4.04	.73
	200	4.22	.49
	300	4.07	.74
	400	4.06	.60
AE	100	3.75	.99
	200	3.06	1.07
	300	3.29	1.26
	400	2.96	1.11

Note: BE = behavioural engagement, EE = emotional engagement; CE = cognitive engagement; AE = agentic engagement
Source: Fieldwork (2023)

In Table 33, it appears that Economics students who are males have high BE (*M* = 4.23, *SD* = .79), EE (*M* = 3.99, *SD* = .85), CE (*M* = 4.09, *SD* = .66) and AE (*M* = 3.48, *SD* = 1.13) as compared to females. Additionally, it seems that Economics students who are in level 200 have higher BE (*M* = 4.60, *SD* = .40) and CE (*M* = 4.22, *SD* = .49) than those in levels 100, 300 and 400. Moreover, from Table 10, it appears that Economics students who are in level 100 have higher AE (*M* = 3.75, *SD* = .99) than those in levels 200, 300 and 400.

In addition, the Levene's test of equality of error variances revealed that the variances were assumed to be equal (see Appendix K). Table 34 presents the results of differences in Economics students' academic engagement based on gender and academic level.

Table 34: MANOVA Results for difference in AEG based on Gender and LES

Effect		Value	F	Hypothesis *df*	Error *df*	*p*	η_p^2
Intercept	V	.972	3880.527	4.000	441.000	.000	.972
G	V	.025	2.786	4.000	441.000	.026	.025
LES	V	.202	8.003	12.000	1329.000	.000	.067
G * LES	V	.033	1.214	12.000	1329.000	.267	.011

Note: Box's M = 253.105, F(70, 68762.495) = 3.470, p < .001; V = Pillai's Trace
Source: Fieldwork (2023)

The Box's M test assessing the equality of homogeneity of variance-covariance matrices yielded a statistically significant result (M = 253.105, F(70, 68762.495) = 3.470, p < .001), indicating a violation of the assumption of equal homogeneity of variance-covariance (Tabachnick & Fidell, 2019). In such instances, Pallant (2020) suggested employing Pillai's Trace. Consequently, the Pillai's Trace test was employed to examine statistical significance, as it is considered more robust in cases where the assumption has been violated, as advised by Pallant (2020).

The results in Table 34 indicate that there are statistically significant differences in Economics students' academic engagement based gender (main effect), F (4, 441.000) = 2.786, p = .026; V = .025, η_p^2 = .025; and academic level (main effect), F (12, 1329.000) = 8.003, p < .001; V = .202, η_p^2 = .067. However, no significance was observed at the two-level interaction (gender and academic level [G*LES]) [F (12, 1329.000) = 1.214, p = .267 > .05; V = .033, η_p^2 = .011].

Pallant (2020) recommended employing the Bonferroni adjustment to ascertain the significance level due to the distinct analyses at the univariate level. Therefore, the initial p-value of .05 underwent division by the number of dependent variables, yielding .05/4 = .0125, approximately equal to .013. Significance is attributed to results only when the p-value is less than .013. Table 35 presents the univariate results.

Table 35: Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	*p*	η_p^2
Corrected Model	BE	16.962	7	2.423	4.446	.000	.066
	EE	2.218	7	.317	.475	.853	.007
	CE	3.739	7	.534	1.178	.314	.018
	AE	64.134	7	9.162	7.883	.000	.111
Intercept	BE	6189.018	1	6189.018	11356.439	.000	.962
	EE	5325.061	1	5325.061	7981.148	.000	.947
	CE	5684.128	1	5684.128	12538.550	.000	.966
	AE	3458.665	1	3458.665	2975.794	.000	.870
Gender	BE	.002	1	.002	.004	.952	.000
	EE	.133	1	.133	.200	.655	.000
	CE	.093	1	.093	.205	.651	.000
	AE	12.074	1	12.074	10.388	.001	.023
LES	BE	12.927	3	4.309	7.907	.000	.051
	EE	.297	3	.099	.148	.931	.001
	CE	1.324	3	.441	.974	.405	.007
	AE	54.546	3	18.182	15.644	.000	.096
G * LES	BE	.430	3	.143	.263	.852	.002
	EE	1.641	3	.547	.820	.484	.006
	CE	1.560	3	.520	1.147	.330	.008
	AE	4.263	3	1.421	1.223	.301	.008
Error	BE	241.971	444	.545			
	EE	296.239	444	.667			
	CE	201.279	444	.453			
	AE	516.046	444	1.162			
Total	BE	8309.680	452				
	EE	7438.750	452				
	CE	7737.680	452				
	AE	5770.000	452				
Corrected Total	BE	258.933	451				
	EE	298.457	451				
	CE	205.018	451				
	AE	580.180	451				

Note: BE = behavioural engagement, EE = emotional engagement; CE = cognitive engagement; AE = agentic engagement; Bonferroni Adjustment at *p* < .0125 (0.05/4)
Source: Fieldwork (2023)

In Table 35, the corrected models for AEG dimensions were not statistically significant except for BE, F(7, 444) = 4.446, p < .001; and AE, F(7, 444) = 7.883, p < .001 were statistically significant. Also, significant difference was observed in Economics students' agentic engagement, F(1, 444) = 10.388, p = .001, η_p^2 = .023; based on gender (main effect). This result implies that males exhibit higher agentic engagement as compared to females. On the contrary, no variations were found in Economics students' BE, EE and CE based on gender (main effect).

Moreover, significant difference was found in Economics students' behavioural engagement, F(3, 444) = 7.907, p < .001, η_p^2 = .051; and agentic engagement, F(3, 444) = 15.644, p < .001, η_p^2 = .096; based on academic level (main effect). Conversely, no significant disparity were observed in EE and CE based on academic level (main effect).

Furthermore, no significant differences were found in Economics students' academic engagement for the two-level interaction effect (gender*academic level [G*LES]). A post-hoc analysis was performed to find out where the differences in the Economics students' BE and AE exist based on academic level. Table 37 presents a summary of the post-hoc analysis.

Table 36: Multiple Comparison of Differences in BE and AE based on Academic Level

Dependent Variable	(I) Academic Level	(J) Academic Level	Mean Difference (I-J)	S. E.	*p*	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
BE	100	200	-.5341*	.09716	.000	-.7847	-.2835
		300	-.1335	.09270	.475	-.3725	.1056
		400	-.1391	.09759	.484	-.3908	.1125
	200	100	.5341*	.09716	.000	.2835	.7847
		300	.4006*	.11155	.002	.1130	.6883
		400	.3950*	.11565	.004	.0968	.6932
	300	100	.1335	.09270	.475	-.1056	.3725
		200	-.4006*	.11155	.002	-.6883	-.1130
		400	-.0056	.11192	1.000	-.2942	.2830
	400	100	.1391	.09759	.484	-.1125	.3908
		200	-.3950*	.11565	.004	-.6932	-.0968
		300	.0056	.11192	1.000	-.2830	.2942
AE	100	200	.6963*	.14190	.000	.3304	1.0623
		300	.4655*	.13537	.004	.1164	.8146
		400	.7993*	.14251	.000	.4318	1.1668
	200	100	-.6963*	.14190	.000	-1.0623	-.3304
		300	-.2308	.16291	.489	-.6509	.1893
		400	.1030	.16889	.929	-.3325	.5385
	300	100	-.4655*	.13537	.004	-.8146	-.1164
		200	.2308	.16291	.489	-.1893	.6509
		400	.3338	.16344	.174	-.0877	.7553
	400	100	-.7993*	.14251	.000	-1.1668	-.4318
		200	-.1030	.16889	.929	-.5385	.3325
		300	-.3338	.16344	.174	-.7553	.0877

Note: BE = behavioural engagement; AE = agentic engagement; Bonferroni Adjustment at $p < .0125$ (0.05/4)
Source: Fieldwork (2023)

In Table 36, the Turkey's HSD post hoc test indicates that there is a statistically significant difference in Economics students' BE between those who are in level 100 and 200 ([I-J] = -.5341, $p < .001$); 200 and 300 ([I-J] = .4006, $p = .002$); and 200 and 400 ([I-J] = .3950, $p = .004$). This result suggests that Economics students who are in level 200 have higher BE compared to those in levels 100, 300 and 400.

Additionally, there are a statistically significant differences in Economics students' agentic engagement between those in level 100 and levels 200, 300 and 400. Interestingly, this result suggests that although agentic engagement was moderate, level 100 students had higher AE as compared those in levels 200, 300 and 400.

Results from SmartPLS (PLS-SEM)

The results obtained from SmartPLS in the context of Partial Least Squares Structural Equation Modeling (PLS-SEM) serve as a pivotal output that guides researchers in drawing substantive conclusions about the hypothesised relationships. SmartPLS provides a comprehensive analysis of the structural model, showcasing the path coefficients, significance levels, and the overall predictive power of the model. Additionally, it offers insights into the explained variance, indicating the proportion of variability in endogenous constructs accounted for by the exogenous variables. Through SmartPLS, researchers can assess the strength and significance of causal relationships, enabling them to validate or refine their theoretical framework. Furthermore, the bootstrapping technique within SmartPLS aids in estimating the confidence intervals of path coefficients, enhancing the robustness of the findings. Overall, the results from SmartPLS in PLS-SEM not only facilitate the confirmation or modification of proposed relationships but also contribute to the substantive advancement of knowledge within the studied domain.

Measurement Model Evaluation

Measurement model evaluation is a critical aspect of PLS-SEM, playing a pivotal role in ensuring the reliability and validity of latent constructs within a research framework. In this phase, researchers assess the quality of the measurement indicators used to operationalise latent variables. This involves scrutinising the reflective measurement models to ascertain the extent to which they accurately capture the underlying constructs. Various statistical metrics, such as factor loadings (indicator reliability), internal consistency reliability, composite reliability, and convergent and discriminant validity, are employed to gauge the precision and consistency of the measurement model (Hair et al., 2022). A robust measurement model is essential for subsequent structural model analyses, as it forms the foundation for drawing meaningful conclusions about relationships between latent constructs. Therefore, a meticulous evaluation of the measurement model in PLS-SEM is indispensable for ensuring the rigor and credibility of the overall research findings.

Validating Higher Order Constructs

When assessing higher-order models, typically, the same criteria used in any PLS-SEM analysis are applicable, as outlined by Chin (2010). Nevertheless, when dealing with higher-order constructs, there are two supplementary measurement models that require evaluation against these criteria. First, there are the measurement models pertaining to the lower-order constituents, and second, there is the measurement model encompassing the entire higher-order construct (Sarstedt, Hair, Cheah, Becker & Ringle, 2019). This latter model is characterised by the interconnections between the higher-order component and its lower-order constituents.

The study employed the disjoint two-stage approach, as proposed by Becker, Cheah, Gholamzade, Ringle and Sarstedt (2023). It is structured in two distinct phases. In the initial stage, this method exclusively leverages lower-order constructs (LOCs), establishing connections between all constructs within the model, where said constructs serve as antecedents and consequences of the overarching higher-order construct. Subsequently, during the second stage of the disjunct two-stage approach, the LOC scores obtained in the first phase are incorporated as indicators in the measurement model of the higher-order construct (HOC), while maintaining the measurement models of the remaining constructs unaltered.

Assessment of Measurement Model for Lower Order Constructs (Motivational orientation constructs and self-regulated learning constructs)

The measurement model was assessed by applying the initial PLS algorithm. Under this section, indicator reliability, internal consistency reliability, and convergent validity for lower order constructs for Motivational orientation constructs and self-regulated learning were assessed.

Indicator Reliability

In PLS-SEM, the concept of indicator reliability pertains to the accuracy and dependability of individual measurement indicators in representing their associated latent constructs. Ensuring the reliability of these indicators is vital for maintaining the integrity of the overall measurement model. Indicator reliability is commonly assessed through factor loadings, which signify the strength of the relationship between each indicator and its underlying latent variable. Higher factor loadings indicate greater reliability, suggesting that the indicator effectively captures the variance in the latent construct it is intended to measure. Researchers often strive for robust indicator reliability as it enhances the precision of the model and contributes to the overall validity of the study. By meticulously evaluating indicator reliability in PLS-SEM, researchers can build confidence in the quality of their measurement instruments, thereby fortifying the foundation for subsequent analyses and interpretations in the structural model.

Internal Consistency Reliability

Internal consistency reliability is a critical measure in research that assesses the degree of consistency or stability of a measurement instrument, ensuring that the items or questions intended to measure the same construct are reliably interconnected. Commonly evaluated through methods such as Cronbach's alpha, this metric indicates the extent to which individual items within a scale or questionnaire consistently measure the underlying construct. A high internal consistency reliability score, typically close to 1, suggests that the items in the instrument are correlated and contribute consistently to the measurement of the targeted construct. Researchers rely on internal consistency reliability to enhance the credibility of their findings, as it reflects the dependability and homogeneity of the measurement tool. Ensuring high internal consistency is imperative for producing reliable and valid research results, as it minimises measurement error and strengthens the overall robustness of the study.

Convergent Validity

Convergent validity in PLS-SEM is a crucial assessment of the extent to which multiple indicators measuring the same latent construct converge or coalesce. It gauges the consistency and reliability of the measurement model by evaluating the degree of agreement among indicators representing a specific latent variable. In PLS-SEM, convergent validity is typically appraised through factor loadings, average variance extracted (AVE), and composite reliability. Adequate convergent validity is indicated when factor loadings are substantial, AVE values exceed a predefined threshold (often 0.5), and composite reliability is satisfactory. High convergent validity suggests that the indicators effectively capture the underlying latent construct, reinforcing the confidence in the reliability of the measurement model. It is essential for ensuring the precision and accuracy of the relationships examined in subsequent structural model analyses within the PLS-SEM framework. Table 37 shows the constructs, items, factor loadings, CA, CR, AVE and VIF of the measurement model.

Table 37: Construct Validity and Reliability

First-order Constructs	Items	Factor Loadings	CA (α)	CR (rho_a)	CR (rho_c)	AVE	VIF
ASE	ASE1	0.797	0.869	0.875	0.900	0.565	2.060
	ASE2	0.589					1.347
	ASE3	0.726					1.598
	ASE5	0.776					1.911
	ASE6	0.826					2.424
	ASE7	0.803					2.187
	ASE8	0.721					1.709
CLB	CLB1	0.789	0.696	0.716	0.815	0.527	1.435
	CLB2	0.744					1.383
	CLB3	0.777					1.470
	CLB4	0.574					1.148
CT	CT2	0.709	0.775	0.782	0.855	0.597	1.402
	CT3	0.804					1.589
	CT4	0.801					1.595
	CT5	0.772					1.502
EGO	EGO1	0.850	0.837	0.842	0.890	0.670	2.761
	EGO2	0.805					2.484
	EGO3	0.810					1.844
	EGO4	0.809					1.730
ELB	ELB1	0.710	0.866	0.868	0.899	0.599	1.618
	ELB2	0.771					1.808
	ELB3	0.818					2.112
	ELB4	0.761					1.783
	ELB5	0.814					2.122
	ELB6	0.766					1.794
ER	ER1	0.902	0.762	0.762	0.893	0.807	1.608
	ER3	0.895					1.608
HS	HS2	0.597	0.705	0.783	0.831	0.627	1.203
	HS3	0.874					1.606
	HS4	0.871					1.636
IGO	IGO1	0.757	0.715	0.735	0.824	0.544	1.419
	IGO2	0.804					1.599
	IGO3	0.787					1.458
	IGO4	0.579					1.162

Table 37: Cont'd

MAP	MAP1	0.846	0.655	0.734	0.813	0.601	1.677
	MAP2	0.888					1.708
	MAP3	0.547					1.096
MAV	MAV1	0.857	0.809	0.814	0.886	0.722	2.442
	MAV2	0.875					2.543
	MAV3	0.815					1.394
MSR	MSR10	0.726	0.854	0.856	0.888	0.533	1.646
	MSR11	0.711					1.654
	MSR3	0.742					1.719
	MSR4	0.726					1.725
	MSR5	0.748					1.823
	MSR6	0.777					1.916
	MSR7	0.674					1.527
ORG	ORG1	0.716	0.764	0.785	0.847	0.580	1.389
	ORG2	0.796					1.447
	ORG3	0.722					1.531
	ORG4	0.809					1.737
PAP	PAP1	0.871	0.852	0.852	0.910	0.772	2.057
	PAP2	0.899					2.438
	PAP3	0.865					1.960
PAV	PAV1	0.916	0.874	0.896	0.922	0.798	2.563
	PAV2	0.909					2.499
	PAV3	0.853					2.123
PL	PL1	0.750	0.754	0.787	0.858	0.669	1.396
	PL2	0.869					1.590
	PL3	0.829					1.651
RH	RH1	0.816	0.837	0.844	0.891	0.671	1.971
	RH2	0.836					1.927
	RH3	0.836					1.824
	RH4	0.787					1.683
TA	TA2	0.658	0.611	0.604	0.795	0.566	1.064
	TA4	0.786					1.582
	TA5	0.805					1.619
TSEM	TSEM1	0.768	0.759	0.776	0.836	0.507	1.502
	TSEM2	0.791					1.646
	TSEM4	0.631					1.372
	TSEM5	0.666					1.399
	TSEM6	0.689					1.309
TVO	TVO1	0.732	0.863	0.871	0.898	0.594	1.904
	TVO2	0.777					2.124
	TVO3	0.752					1.762
	TVO4	0.797					1.963
	TVO5	0.738					1.789
	TVO6	0.824					1.993

Note: ASE = Academic Self-Efficacy; CLB = Control of Learning Beliefs; CT = Critical Thinking; EGO = Extrinsic Goal Orientation; ELB = Elaboration; ER = Effort Regulation; HS = Help Seeking; IGO = Intrinsic Orientation; MAP = Mastery Approach Goal Orientation; MAV = Mastery Avoidance Goal Orientation; MSR = Metacognitive Self-Regulation; ORG = Organisation; PAP = Performance Approach Goal Orientation; PAV = Performance Avoidance Goal Orientation; PL = Planning; RH = Rehearsal; TA = Test Anxiety; TSEM = Time and Study Environment Management; TVO = Task Value Orientation; CA = Cronbach's Alpha (α); CR = Composite Reliability; AVE = Average Variance Extracted; and VIF = Variance Inflation Factor.
Source: Fieldwork (2023)

In Table 37, the indicator loadings ranged from 0.574 to 0.916, surpassing the minimum threshold of .40 (Hair et al., 2022). Generally, indicators with loadings between 0.40 and 0.708 should be considered for removal only when deleting the indicator leads to an increase in the internal consistency reliability or convergent validity above the suggested threshold value (Hair, Hult, Ringle, Sarstedt, Danks & Ray, 2021). However, indicators with very low loadings (below 0.40) should always be eliminated from the measurement model (Hair et al., 2022). Also, the Cronbach's α values, ranging from .604 to .876, exceeded the suggested threshold of 0.6 by Hair et al. (2021). Again, CR values were examined and found to be within the range of .846 to .916, surpassing the threshold of 0.7. Additionally, the AVE values for all constructs (e.g., $AVE_{ASE} = .565$; $AVE_{TVO} = .594$) were above .50, all surpassing the acceptable threshold (Hair et al., 2022). The AVE values indicate satisfactory levels of convergent validity for all constructs, as Hair et al. (2022) recommended. Figure 14 depicts the PLS-SEM algorithm results for Lower-order constructs (LOCs)/First-order constructs (MO and SRL).

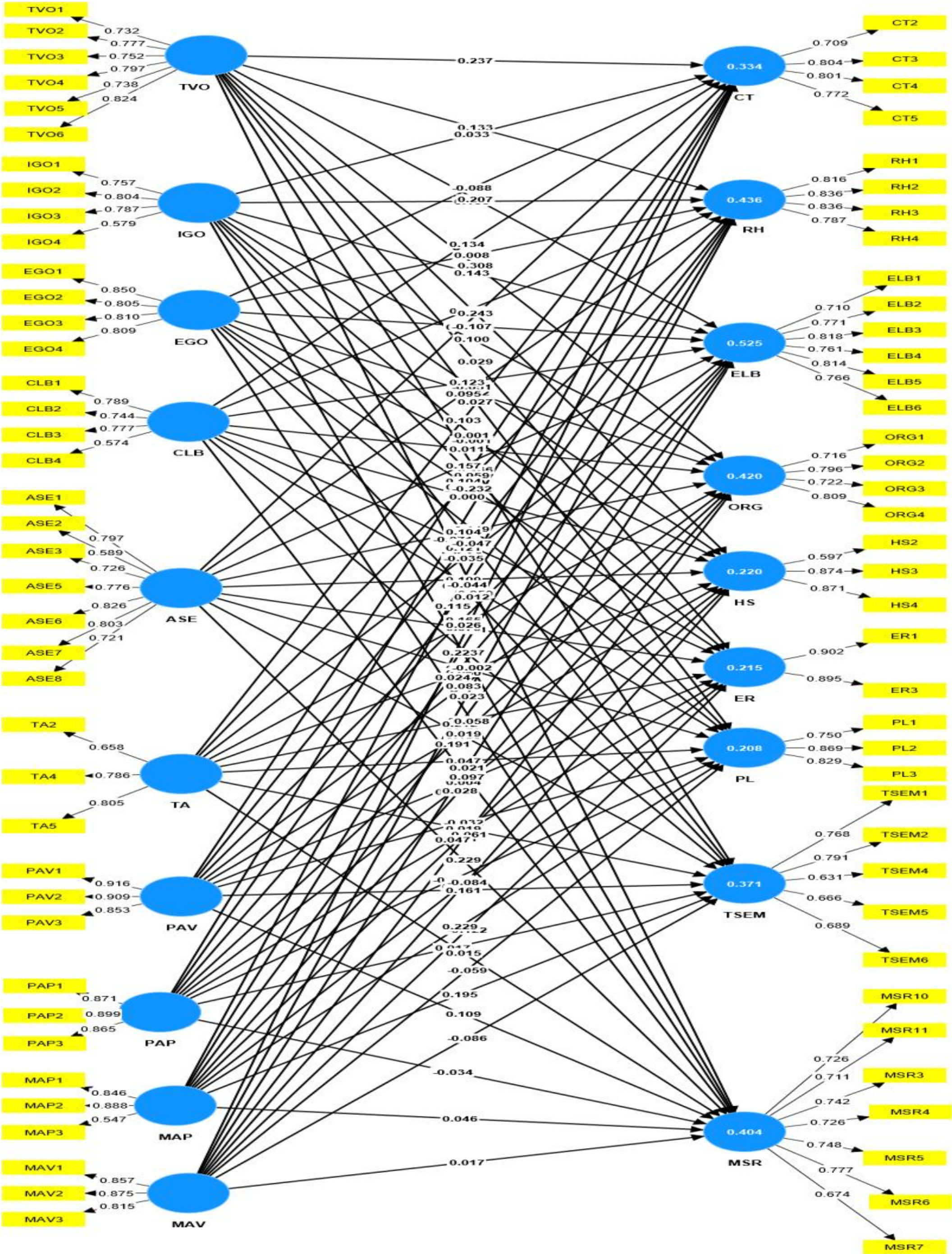


Figure 14: PLS-SEM Algorithm results for LOCs (MO and SRL)
Source: Fieldwork (2023)

Discriminant Validity

Discriminant validity in PLS-SEM is a crucial evaluation aimed at ensuring that distinct latent constructs are truly distinct and not interchangeable. It addresses the concern that measurement indicators representing different constructs should have higher correlations with their respective constructs than with other constructs in the model. Commonly assessed by comparing square roots of average variance extracted (AVE) and inter-construct correlations, discriminant validity establishes that the variance captured by each construct is greater than the shared variance with other constructs. Achieving robust discriminant validity is essential for preventing multicollinearity issues and ensuring that the model accurately distinguishes between the latent variables under investigation. Rigorous assessment of discriminant validity in PLS-SEM is integral to substantiate the distinctiveness of the latent constructs, thereby enhancing the credibility of the structural relationships proposed in the research framework.

Discriminant Validity Using Fornell-Larcker Criterion

The Fornell-Larcker criterion is a key assessment tool in PLS-SEM used to evaluate discriminant validity. Developed by Fornell and Larcker (1981), this criterion examines the square roots of the average variance extracted (AVE) for each latent construct and compares them with the correlations between constructs. The criterion asserts that for discriminant validity to be established, the square root of the AVE for a given construct should be greater than the correlations between that construct and other constructs in the model. In other words, a latent construct should explain more variance within itself than it shares with other constructs. Researchers rely on the Fornell-Larcker criterion to ensure that the measurement model accurately discriminates between different latent constructs, providing a robust method for validating the distinctiveness of the constructs in PLS-SEM analyses. Meeting the Fornell-Larcker criterion reinforces the reliability and validity of the structural model, enhancing the overall credibility of the research findings. Results in Table 38 show that the square roots of the AVE ($\sqrt{AVE}$) exceeded the inter-construct correlations (Fornell & Larcker, 1981).

HTMT Ratio Criterion

The Heterotrait-Monotrait (HTMT) ratio criterion is a valuable metric in PLS-SEM used to assess discriminant validity. Specifically, it evaluates the ratio of the correlations between constructs to the square root of the average variance extracted (AVE) for each construct. A criterion value below a certain threshold, often set at 0.9 (Henseler et al., 2015), indicates satisfactory discriminant validity. The HTMT criterion offers a more stringent test compared to the Fornell-Larcker criterion, providing researchers with a nuanced perspective on the distinctiveness of latent constructs. Researchers employ the HTMT criterion to ensure that the constructs in the model are sufficiently different from each other, addressing concerns of potential overlap and enhancing the rigor of PLS-SEM analyses. Table 39 reveals that HTMT ratios (e.g., $\mathrm{HTMT}_{\mathrm{ASE/CLB}} = .837$; $\mathrm{HTMT}_{\mathrm{ASE/MAP}} = .866$) did not exceed the threshold of .90 (Henseler et al., 2015).

Table 38: Fornell-Larcker Criterion

	ASE	CLB	CT	EGO	ELB	ER	HS	IGO	MAP	MAV	MSR	ORG	PAP	PAV	PL	RH	TA	TSEM	TVO
ASE	**0.752**																		
CLB	0.658	**0.726**																	
CT	0.512	0.453	**0.772**																
EGO	0.569	0.505	0.323	**0.819**															
ELB	0.626	0.536	0.611	0.426	**0.774**														
ER	0.028	0.046	-0.077	-0.187	-0.048	**0.899**													
HS	0.380	0.305	0.390	0.317	0.462	-0.101	**0.792**												
IGO	0.551	0.419	0.370	0.423	0.521	-0.018	0.239	**0.737**											
MAP	0.682	0.523	0.452	0.558	0.607	-0.048	0.359	0.558	**0.775**										
MAV	0.333	0.321	0.195	0.371	0.314	-0.157	0.156	0.280	0.383	**0.849**									
MSR	0.578	0.494	0.707	0.448	0.658	-0.081	0.406	0.391	0.488	0.272	**0.730**								
ORG	0.531	0.436	0.620	0.474	0.676	-0.062	0.504	0.436	0.481	0.255	0.652	**0.762**							
PAP	0.355	0.308	0.189	0.479	0.334	-0.116	0.320	0.209	0.356	0.402	0.273	0.415	**0.878**						
PAV	0.374	0.305	0.256	0.450	0.386	-0.096	0.265	0.207	0.358	0.256	0.320	0.379	0.638	**0.893**					
PL	0.380	0.263	0.454	0.346	0.447	-0.229	0.559	0.308	0.412	0.139	0.481	0.486	0.162	0.162	**0.818**				
RH	0.537	0.423	0.517	0.456	0.685	-0.126	0.460	0.482	0.570	0.319	0.525	0.650	0.397	0.394	0.482	**0.819**			
TA	0.147	0.167	0.184	0.275	0.132	-0.398	0.162	0.144	0.274	0.202	0.140	0.176	0.287	0.258	0.150	0.203	**0.752**		
TSEM	0.522	0.431	0.638	0.411	0.634	-0.145	0.503	0.342	0.508	0.191	0.726	0.601	0.296	0.358	0.563	0.590	0.153	**0.712**	
TVO	0.742	0.651	0.509	0.572	0.626	0.025	0.389	0.613	0.666	0.364	0.573	0.564	0.284	0.269	0.350	0.533	0.098	0.527	**0.771**

Note: Bolded values are the $\sqrt{AVE}$

Source: Fieldwork (2023)

Table 39: HTMT Ratio Criterion

	ASE	CLB	CT	EGO	ELB	ER	HS	IGO	MAP	MAV	MSR	ORG	PAP	PAV	PL	RH	TA	TSEM	TVO
ASE																			
CLB	0.837																		
CT	0.620	0.610																	
EGO	0.664	0.654	0.388																
ELB	0.718	0.677	0.750	0.493															
ER	0.060	0.102	0.099	0.241	0.063														
HS	0.471	0.426	0.549	0.379	0.585	0.142													
IGO	0.692	0.582	0.489	0.540	0.652	0.055	0.358												
MAP	0.866	0.729	0.609	0.753	0.789	0.071	0.475	0.804											
MAV	0.389	0.409	0.243	0.444	0.366	0.200	0.198	0.358	0.545										
MSR	0.666	0.624	0.867	0.527	0.762	0.132	0.519	0.499	0.635	0.319									
ORG	0.627	0.577	0.805	0.545	0.827	0.123	0.698	0.571	0.631	0.301	0.789								
PAP	0.414	0.413	0.234	0.571	0.390	0.145	0.378	0.267	0.464	0.472	0.317	0.501							
PAV	0.420	0.385	0.305	0.525	0.437	0.116	0.303	0.265	0.473	0.308	0.366	0.430	0.740						
PL	0.462	0.359	0.597	0.417	0.551	0.304	0.794	0.411	0.561	0.171	0.605	0.637	0.193	0.189					
RH	0.622	0.547	0.637	0.535	0.805	0.159	0.607	0.613	0.753	0.372	0.617	0.814	0.473	0.455	0.594				
TA	0.253	0.260	0.262	0.381	0.194	0.591	0.230	0.220	0.421	0.281	0.232	0.243	0.399	0.350	0.229	0.284			
TSEM	0.623	0.581	0.827	0.497	0.779	0.208	0.686	0.448	0.672	0.232	0.890	0.773	0.365	0.427	0.732	0.731	0.233		
TVO	0.848	0.816	0.611	0.661	0.716	0.071	0.474	0.773	0.856	0.425	0.658	0.652	0.326	0.296	0.426	0.612	0.197	0.622	

Note: $HTMT_{0.85}$ or $HTMT_{0.90}$

Source: Fieldwork (2023)

Validating Higher Order Construct

The use of higher-order constructs in PLS-SEM has gained prominence as a growing trend (Sarstedt, Hair, Cheah, Becker & Ringle, 2019). These constructs enable the modelling of a concept at both a more abstract, overarching level and its more specific, concrete sub-dimensions, reflecting an evolving practice in PLS-SEM applications (Sarstedt et al., 2019).

Validating Reflective-Reflective Higher Order Construct (Self-Regulated Learning)

Self-regulated learning (SRL) was a higher-order construct in the study based on nine (9) lower-order constructs: Rehearsal (RH), Elaboration (ELB), Organisation (ORG), Critical Thinking (CT), Metacognitive Self-Regulation (MSR), Time and Study Environment Management (TSEM), Effort Regulation (ER), Peer Learning (PL) and Help-Seeking (HS). SRL is measured as Reflective-Reflective higher order construct in the study. In order to establish the higher order construct validity, the indicator loadings, reliability and validity were assessed. The indicator loadings of all the indicators for SRL have a value greater than the minimum acceptable value of 0.50 (Hair et al., 2019). Item ER was removed due to low indicator loading. Reliability was examined using Cronbach’s alpha and composite reliability, and the statistics for both were greater than the recommended value of 0.70 and above (Hair et al., 2019).

Convergent validity was acceptable because the AVE was higher than 0.50 for the higher-order construct. Discriminant validity was assessed by comparing the correlations among the latent variables with the square root of

AVE (Fornell & Larcker, 1981) and HTMT ratio. The square root of AVE for the construct is higher than it correlation with all other constructs and HTMT results revealed that HTMT ratio is less than the required threshold of 0.90 (Henseler et al., 2015). Therefore, discriminant validity is established for higher order construct of SRL. Table 40 presents the results for indicator loadings, reliability and AVE for the higher-order construct.

Table 40: Indicator Loadings, Reliability and AVE for Higher-order Constructs (HOC) [SRL]

Higher-order Constructs	Outer Loadings	CA	CR (rho_a)	CR (rho_c)	AVE
CT <- SRL	0.790	0.863	0.923	0.903	0.551
ELB <- SRL	0.844				
ER* <- SRL	-0.138				
HS <- SRL	0.652				
MSR <- SRL	0.830				
ORG <- SRL	0.836				
PL <- SRL	0.679				
RH <- SRL	0.794				
TSEM <- SRL	0.838				

Note: RH = rehearsal; ELB = elaboration; ORG = organisation; CT = critical thinking; MSR = metacognitive self-regulation; TSEM = time and study environment management; ER = effort regulation; PL = peer learning; and HS = help seeking; ER* was deleted because low outer loading
Source: Fieldwork (2023)

Figure 15 shows the PLS-SEM algorithm results for the higher order construct (SRL).

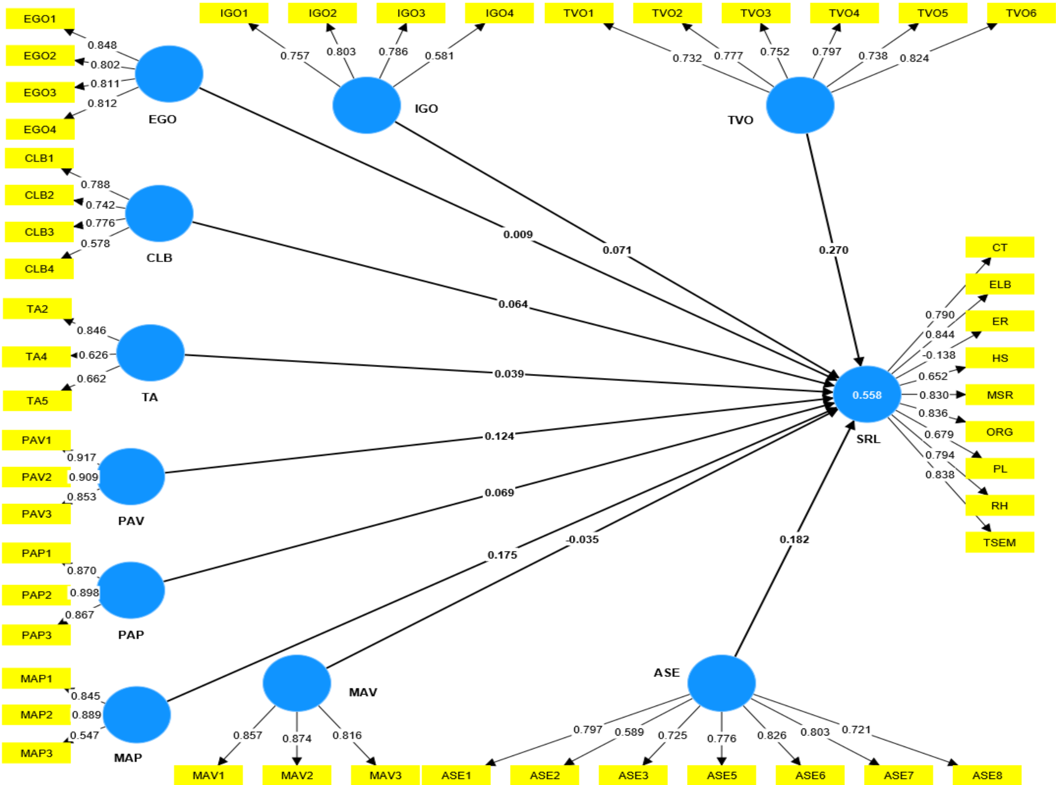


Figure 15: PLS-SEM Algorithm Results for HOC (SRL)
Source: Fieldwork (2023)

Discriminant Validity for the Higher Order Construct (SRL)

The results from Table 41 and 42 reveal that discriminant validity has been achieved. For instance, in Table 42, all the HTMT values were within the thresholds of .85 and .90 (Henseler et al., 2015). Tables 41 and 42 illustrate the Fornell-Larcker criterion and HTMT criterion for assessing discriminant validity.

Table 41: Fornell and Larcker Criterion

	ASE	CLB	EGO	IGO	MAP	MAV	PAP	PAV	SRL	TA	TVO
ASE	**0.752**										
CLB	0.658	**0.726**									
EGO	0.570	0.505	**0.818**								
IGO	0.551	0.419	0.423	**0.737**							
MAP	0.682	0.523	0.559	0.558	**0.775**						
MAV	0.334	0.320	0.372	0.281	0.384	**0.849**					
PAP	0.355	0.309	0.479	0.209	0.356	0.402	**0.878**				
PAV	0.374	0.305	0.450	0.207	0.358	0.257	0.638	**0.893**			
SRL	0.656	0.542	0.515	0.502	0.625	0.303	0.387	0.412	**0.743**		
TA	0.213	0.206	0.298	0.161	0.304	0.213	0.257	0.282	0.240	**0.718**	
TVO	0.742	0.650	0.573	0.613	0.666	0.365	0.284	0.269	0.658	0.137	**0.771**

Source: Fieldwork (2023)

Table 42: HTMT Ratio

	ASE	CLB	EGO	IGO	MAP	MAV	PAP	PAV	SRL	TA	TVO
ASE											
CLB	0.837										
EGO	0.664	0.654									
IGO	0.692	0.582	0.540								
MAP	0.866	0.729	0.753	0.804							
MAV	0.389	0.409	0.444	0.358	0.545						
PAP	0.414	0.413	0.571	0.267	0.464	0.472					
PAV	0.420	0.385	0.525	0.265	0.473	0.308	0.740				
SRL	0.721	0.665	0.601	0.601	0.778	0.358	0.444	0.451			
TA	0.253	0.260	0.381	0.220	0.421	0.281	0.399	0.350	0.353		
TVO	0.848	0.816	0.661	0.773	0.856	0.425	0.326	0.296	0.721	0.197	

Source: Fieldwork (2023)

Validating Lower Order Constructs for Academic Engagement (AEG)

This section focused on the measurement model for lower order constructs for academic engagement. Table 43 shows the indicator loadings, reliabilities (α and CR) and AVE for the lower order constructs.

Table 43: Construct Validity and Reliability

Lower-order Constructs	Items	Indicator Loadings	CA (α)	CR (rho_a)	CR (rho_c)	AVE	VIF
AE	AE1	0.830	0.929	0.932	0.947	0.780	2.259
	AE2	0.875					3.487
	AE3	0.914					4.375
	AE4	0.903					4.337
	AE5	0.892					3.975
BE	BE1	0.888	0.869	0.883	0.907	0.664	3.179
	BE2	0.894					3.556
	BE3	0.863					2.646
	BE4	0.633					1.351
	BE5	0.765					1.645
CE	CE1	0.814	0.828	0.846	0.879	0.595	1.911
	CE2	0.614					1.351
	CE3	0.803					1.929
	CE4	0.810					2.037
	CE5	0.794					1.915
EE	EE2	0.877	0.868	0.882	0.910	0.716	2.416
	EE3	0.828					2.014
	EE4	0.883					2.558
	EE5	0.794					1.874
CT	CT2	0.781	0.775	0.783	0.854	0.594	1.402
	CT3	0.777					1.589
	CT4	0.771					1.595
	CT5	0.754					1.502
ELB	ELB1	0.737	0.866	0.880	0.898	0.596	1.618
	ELB2	0.745					1.808
	ELB3	0.786					2.112
	ELB4	0.798					1.783
	ELB5	0.826					2.122
	ELB6	0.736					1.794
ER	ER1	0.846	0.762	0.874	0.889	0.800	1.608
	ER3	0.941					1.608
HS	HS2	0.736	0.705	0.704	0.836	0.631	1.203
	HS3	0.813					1.606
	HS4	0.830					1.636
MSR	MSR10	0.738	0.854	0.868	0.887	0.529	1.646
	MSR11	0.758					1.654
	MSR3	0.739					1.719
	MSR4	0.715					1.725

Table 43: Cont'd

	MSR5	0.737					1.823
	MSR6	0.757					1.916
	MSR7	0.640					1.527
ORG	ORG1	0.739	0.764	0.768	0.850	0.586	1.389
	ORG2	0.727					1.447
	ORG3	0.763					1.531
	ORG4	0.829					1.737
PL	PL1	0.796	0.754	0.757	0.859	0.670	1.396
	PL2	0.838					1.590
	PL3	0.822					1.651
RH	RH1	0.858	0.837	0.853	0.890	0.669	1.971
	RH2	0.814					1.927
	RH3	0.793					1.824
	RH4	0.807					1.683
TSEM	TSEM1	0.725	0.759	0.774	0.837	0.508	1.502
	TSEM2	0.782					1.646
	TSEM4	0.658					1.372
	TSEM5	0.740					1.399
	TSEM6	0.649					1.309

Note: AE = Agentic Engagement; BE = Behavioural Engagement; CE = Cognitive Engagement; EE = Emotional Engagement; CT = Critical Thinking; ELB = Elaboration; ER = Effort Regulation; HS = Help Seeking; MSR = Metacognitive Self-Regulation; ORG = Organisation; PL = Planning; RH = Rehearsal; TSEM = Time and Study Environment Management; CA = Cronbach's Alpha (α); CR = Composite Reliability; AVE = Average Variance Extracted; and VIF = Variance Inflation Factor.
Source: Fieldwork (2023)

The results in Table 43 show that all the indicators for the measurement model were acceptable. For example, the indicator loadings ranged from 0.614 to .914 (Hair et al., 2022). Also, the Cronbach's α and CR values exceeded the recommended threshold of 0.6 (Hair et al., 2021). Additionally, the AVE values for all constructs (e.g., $\text{AVE}_{\text{AE}} = .780$; $\text{AVE}_{\text{EE}} = .716$) were above .50 (Hair et al., 2022). The outcomes of the PLS-SEM algorithm for the LOC (AEG) are depicted in Figure 16.

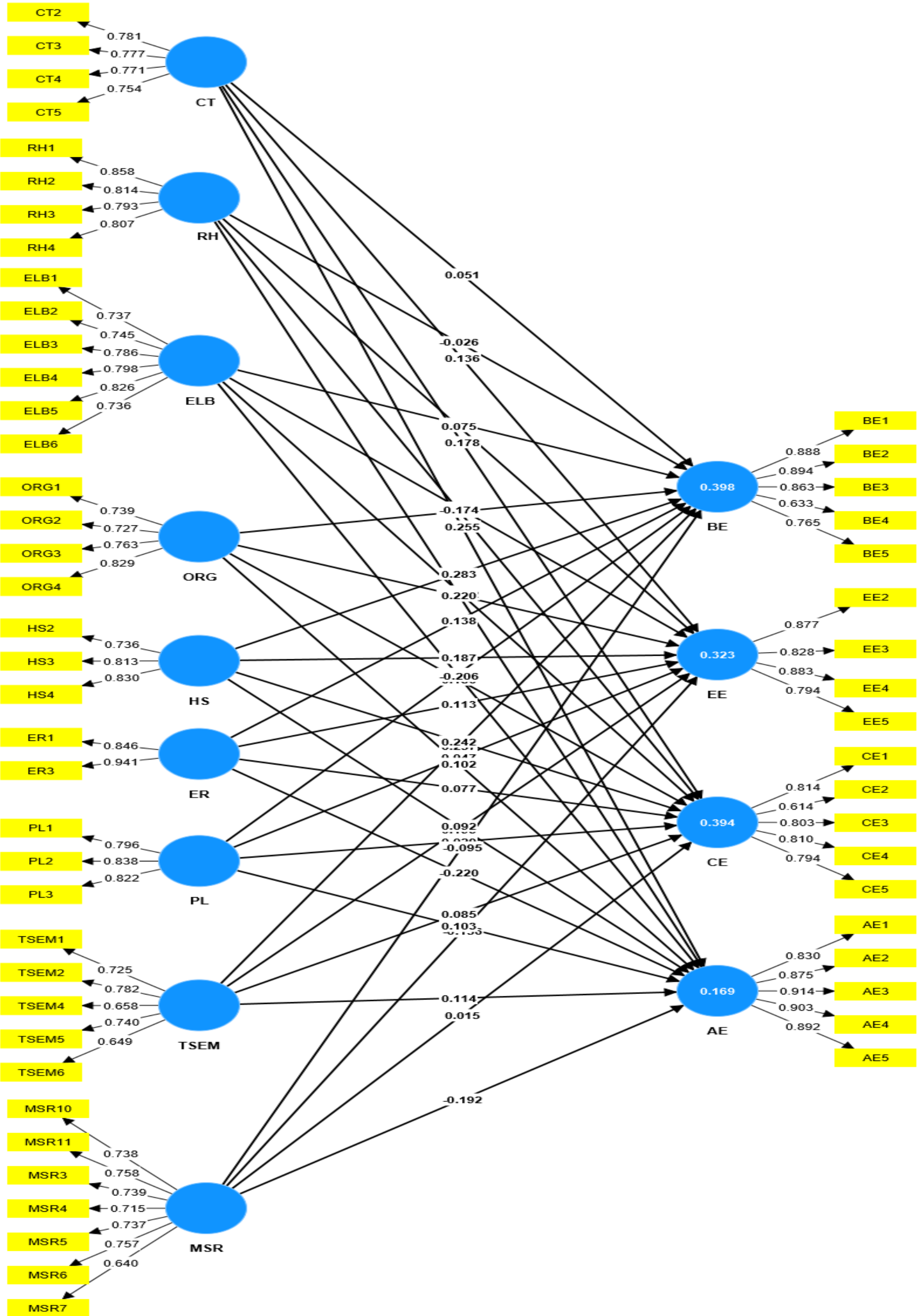


Figure 16: PLS-SEM Algorithm Results for LOC (AEG).
Source: Fieldwork (2023)

Discriminant Validity

This metric gauges the extent to which a construct is empirically distinct from other constructs in the structural model. The Fornell-Larcker criterion results in Table 44 indicate that $\sqrt{AVE}$ (.771 to .883) surpassed the inter-factor correlations (Fornell & Larcker, 1981). Additionally, the HTMT ratio, which involves evaluating the correlation between two latent variables, was employed to evaluate the discriminant validity (Henseler et al., 2015). Henseler et al. recommended that the HTMT values for the constructs within the model should not exceed 0.90, which serves as an indicator of discriminant validity. The values presented in Table 45, ranging from .045 to .890, are all below this threshold. Consequently, the model achieved discriminant validity. Tables 44 and 45 display the results of discriminant validity.

Table 44: Fornell-Larcker Criterion

	AE	BE	CE	CT	EE	ELB	ER	HS	MSR	ORG	PL	RH	TSEM
AE	**0.883**												
BE	0.178	**0.815**											
CE	0.271	0.568	**0.771**										
CT	0.228	0.412	0.497	**0.771**									
EE	0.287	0.558	0.639	0.410	**0.846**								
ELB	0.067	0.435	0.497	0.616	0.404	**0.772**							
ER	-0.270	0.072	0.021	-0.072	0.035	-0.044	**0.895**						
HS	0.214	0.502	0.477	0.410	0.438	0.468	-0.106	**0.794**					
MSR	0.110	0.397	0.467	0.709	0.350	0.648	-0.079	0.415	**0.728**				
ORG	0.172	0.537	0.510	0.622	0.478	0.683	-0.051	0.515	0.645	**0.766**			
PL	0.248	0.347	0.384	0.456	0.363	0.454	-0.229	0.579	0.496	0.485	**0.819**		
RH	0.139	0.402	0.349	0.507	0.414	0.689	-0.122	0.474	0.520	0.660	0.474	**0.818**	
TSEM	0.206	0.481	0.473	0.643	0.444	0.640	-0.154	0.515	0.734	0.602	0.571	0.589	**0.712**

Source: Fieldwork (2023)

Table 45: HTMT Ratio

	AE	BE	CE	CT	EE	ELB	ER	HS	MSR	ORG	PL	RH	TSEM
AE													
BE	0.227												
CE	0.333	0.653											
CT	0.267	0.497	0.601										
EE	0.320	0.633	0.739	0.483									
ELB	0.085	0.477	0.558	0.750	0.442								
ER	0.307	0.089	0.070	0.099	0.045	0.063							
HS	0.265	0.642	0.624	0.549	0.556	0.585	0.142						
MSR	0.132	0.437	0.526	0.867	0.385	0.762	0.132	0.519					
ORG	0.218	0.652	0.628	0.805	0.577	0.827	0.123	0.698	0.789				
PL	0.298	0.426	0.488	0.597	0.442	0.551	0.304	0.794	0.605	0.637			
RH	0.157	0.457	0.407	0.637	0.472	0.805	0.159	0.607	0.617	0.814	0.594		
TSEM	0.284	0.574	0.571	0.827	0.530	0.779	0.208	0.686	0.890	0.773	0.732	0.731	

Source: Fieldwork (2023)

Validating Reflective-Reflective Higher Order Construct (Academic Engagement)

Academic Engagement (AEG) was a higher-order construct in the study based on four (4) lower-order constructs: Agentic Engagement (AE), Behavioural Engagement (BE), Cognitive Engagement (CE) and Emotional Engagement (EE). AEG is measured as Reflective-Reflective higher-order construct in the study. In order to establish the higher-order construct validity, the factor loadings, reliability and validity were assessed. The loadings of all the indicators for AEG have a value greater than the minimum acceptable value of 0.50 (Hair et al., 2019). None of the AEG items were removed due to low factor loadings. However, item ER of SRL was deleted because of low loading and the loading for AE (0.419) was maintained because it did not influence the AVE for AEG. Reliability was examined using Cronbach's alpha and composite reliability, statistics for both were greater than the recommended value of 0.70 and above (Hair, Hult, Ringle & Sarstedt, 2017).

Convergent validity was acceptable because the AVE was higher than 0.50 for the higher-order construct (Hair et al., 2017). Discriminant validity was assessed by comparing the correlations among the latent variables with the square root of AVE (Fornell & Larcker, 1981) and Heterotrait-Monotrait Ratio. The square root of AVE for the construct is higher than it correlation with all other constructs, and HTMT results revealed that HTMT ratio is less than the required threshold of 0.90. Therefore, discriminant validity is established for higher order construct of SRL. Table 46 presents the measurement model indicators for the AEG and SRL HOCs.

Table 46: Factor Loadings, Reliability and AVE for HOCs (AEG and SRL)

Higher-order constructs	Outer Loadings	CA	CR (rho_a)	CR (rho_c)	AVE
AE (AEG)	0.419	0.741	0.814	0.837	0.577
BE (AEG)	0.816				
CE (AEG)	0.864				
EE (AEG)	0.849				
CT (SRL)	0.790	0.912	0.916	0.929	0.662
ELB (SRL)	0.825				
HS (SRL)	0.701				
MSR (SRL)	0.818				
ORG (SRL)	0.836				
PL (SRL)	0.707				
RH (SRL)	0.774				
TSEM (SRL)	0.842				

Note: AEG = Academic Engagement; AE = Agentic Engagement; BE = Behavioural Engagement; CE = Cognitive Engagement; EE = Emotional Engagement; CT = Critical Thinking; ELB = Elaboration; ER = Effort Regulation; HS = Help Seeking; MSR = Metacognitive Self-Regulation; ORG = Organisation; PL = Planning; RH = Rehearsal; TSEM = Time and Study Environment Management; SRL = Self-regulated Learning
Source: Fieldwork (2023)

Figure 17 shows the PLS-SEM algorithm results for the HOCs (SRL and AEG)

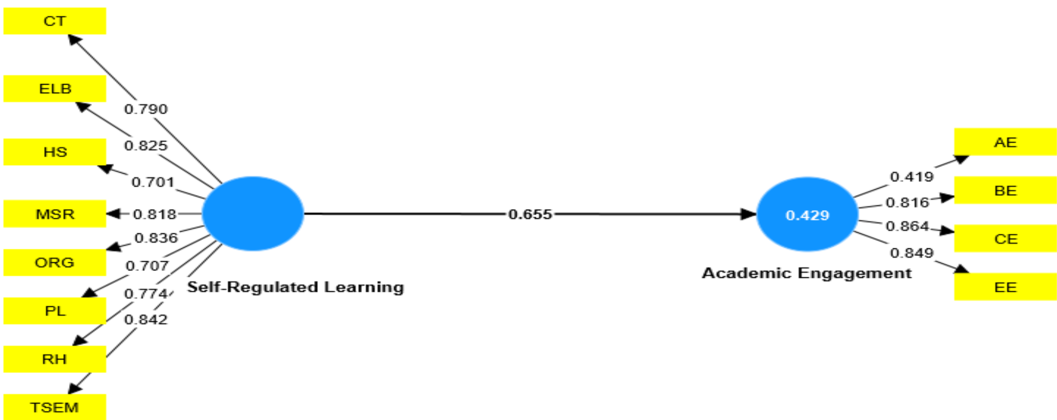


Figure 17: PLS-SEM algorithm results for the HOCs (SRL and AEG)
Source: Fieldwork (2023)

Discriminant Validity for HOCs (AEG and SRL)

Discriminant validity for the HOCs for AEG and SRL was assessed using the Fornell-Larcker and HTMT ratio criteria. Table 47 shows the results of the discriminant validity for the HOCs.

Table 47: Discriminant validity for the HOCs

	Academic Engagement	Self-Regulated Learning
Academic Engagement	*0.760*	**0.763**
Self-Regulated Learning	0.655	*0.788*

Note: HOCs = Higher Order Constructs; the bolden value is the HTMT ratio < 0.85 ($HTMT_{0.85}$)

The results in Table 47 indicate that discriminant validity is achieved. The values for the Fornell-Larcker and HTMT ratio criteria met the accepted thresholds (Fornell & Larcker, 1981; Henseler et al., 2015).

Measurement Model for the Final PLS-SEM Model without Moderators

This study utilises partial least squares structural equation modeling (PLS-SEM; Lohmöller, 1989; Wold, 1982) and the SmartPLS 4 software (Ringle et al., 2022) to estimate and evaluate the research model. The analysis adheres to the guidelines and procedures suggested by Hair et al. (2019). The assessment of the reflective measurement models, applicable to all constructs in the model, encompasses indicator reliability, internal consistency reliability, convergent validity, and discriminant validity.

The primary objective of this study was to examine both the direct effect and its moderation within the study. In accordance with the guidance provided by Becker et al. (2023), this study evaluated the direct effects within the foundational model, devoid of interaction terms, before progressing to the comprehensive model that incorporates the moderator. Table 48 shows the measurement model indicators for the final model without moderators.

Table 48: Construct Validity and Reliability

Constructs	Items	Factor Loadings	CA (α)	CR (rho_a)	CR (rho_c)	AVE	VIF
AEG	AE	0.416	0.741	0.815	0.837	0.577	1.105
	BE	0.817					1.631
	CE	0.865					1.923
	EE	0.849					1.910
ASE	ASE1	0.796	0.869	0.875	0.900	0.565	2.060
	ASE2	0.590					1.347
	ASE3	0.724					1.598
	ASE5	0.776					1.911
	ASE6	0.825					2.424
	ASE7	0.804					2.187
	ASE8	0.723					1.709
CLB	CLB1	0.782	0.696	0.710	0.815	0.527	1.435
	CLB2	0.741					1.383
	CLB3	0.774					1.470
	CLB4	0.590					1.148
EGO	EGO1	0.846	0.837	0.845	0.890	0.670	2.761
	EGO2	0.801					2.484
	EGO3	0.811					1.844
	EGO4	0.815					1.730
IGO	IGO1	0.763	0.715	0.734	0.824	0.544	1.419
	IGO2	0.804					1.599
	IGO3	0.781					1.458
	IGO4	0.579					1.162
MAP	MAP1	0.847	0.655	0.734	0.813	0.601	1.677
	MAP2	0.889					1.708
	MAP3	0.543					1.096
MAV	MAV1	0.856	0.809	0.816	0.886	0.721	2.442
	MAV2	0.874					2.543
	MAV3	0.817					1.394
PAP	PAP1	0.869	0.852	0.852	0.910	0.771	2.057
	PAP2	0.898					2.438
	PAP3	0.868					1.960
PAV	PAV1	0.916	0.874	0.900	0.922	0.797	2.563
	PAV2	0.912					2.499
	PAV3	0.850					2.123
TA	TA2	0.844	0.611	0.695	0.759	0.516	1.064
	TA4	0.634					1.582
	TA5	0.659					1.619
TVO	TVO1	0.730	0.863	0.872	0.897	0.594	1.904
	TVO2	0.776					2.124
	TVO3	0.753					1.762
	TVO4	0.797					1.963
	TVO5	0.739					1.789
	TVO6	0.824					1.993
SRL	CT	0.792	0.912	0.918	0.929	0.622	2.356
	ELB	0.837					2.719
	HS	0.680					1.755
	MSR	0.826					3.020
	ORG	0.836					2.623
	PL	0.694					1.828
	RH	0.784					2.321
	TSEM	0.842					2.864

Source: Fieldwork (2023)

In Table 48, it is observed that all outer loadings for the constructs, with the exception of AE, ASE2, CLB4, IGO4, and MAP3, surpass the crucial threshold of 0.6, thereby confirming indicator reliability. However, it is advisable to retain items with loadings falling within the range of 0.40-0.708 to prevent undue interference with the average variance extracted (AVE) and composite reliability (CR) metrics (Kraus, Rehman & Garcia, 2020; Rehman, Bhatti, Kraus & Ferreira, 2021). Furthermore, the results indicating Cronbach's alpha and rho_c values exceeding 0.6 attest to the internal consistency reliability, a characteristic evident across all constructs within the model. Convergent validity is substantiated by average variance extracted values surpassing 0.5 for all constructs (e.g., $\mathrm{AVE_{AEG}}$ = .577; $\mathrm{AVE_{ASE}}$ = .565; $\mathrm{AVE_{AEG}}$ = .577; $\mathrm{AVE_{MAV}}$ = .721; $\mathrm{AVE_{PAV}}$ = .797) in the model. Figure 18 shows the PLS-SEM algorithm results for the final model without moderators

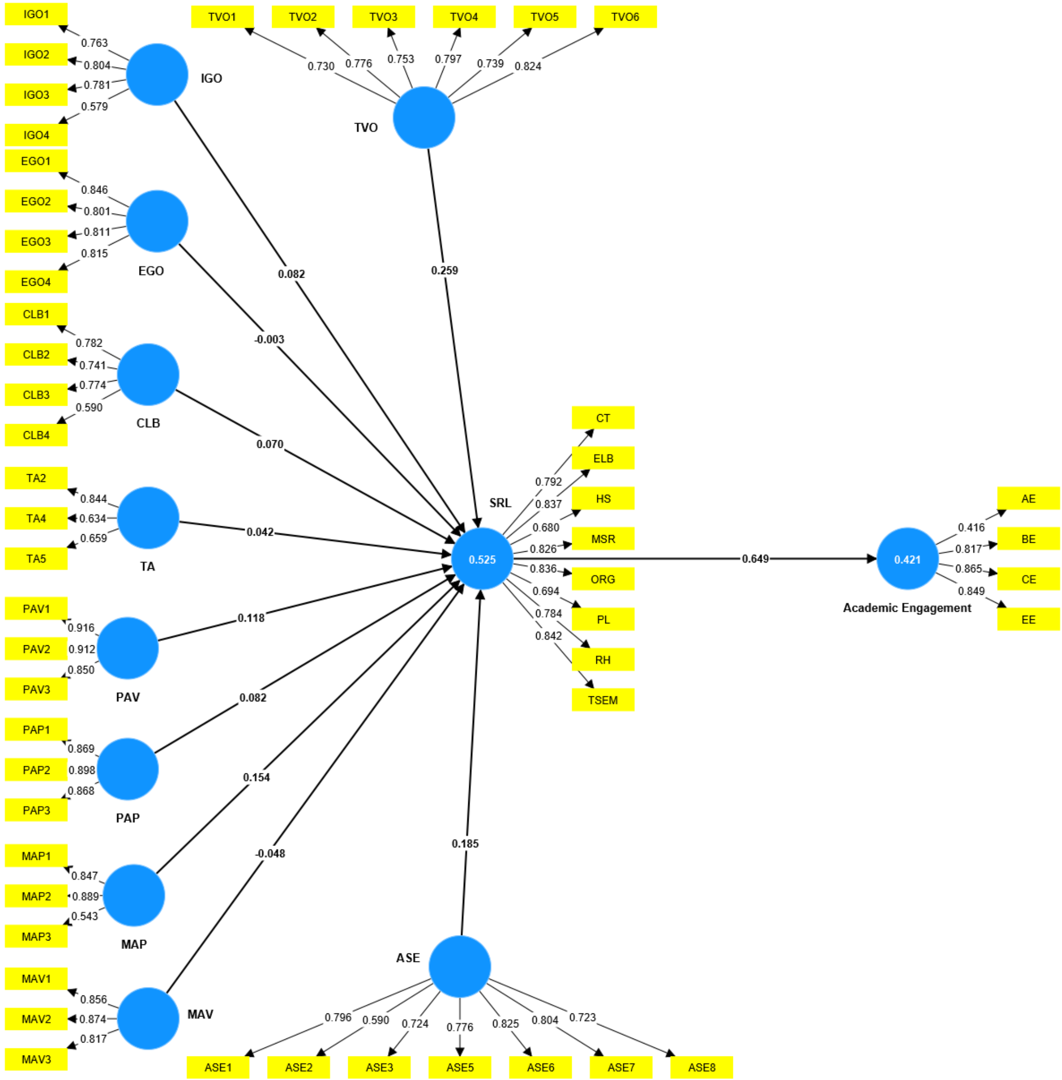


Figure 18: PLS-SEM Algorithm Results for the Final Model without moderators
Source: Fieldwork (2023)

Discriminant Validity for Final PLS-SEM Model without Moderators

Discriminant validity of the final PLS-SEM model without moderators revealed that discriminant validity was achieved. For example, in Table 50, the results indicate that the $\sqrt{\text{AVE}}$ values are greater than the inter-construct correlations (Fornell & Larcker, 1981). Additionally, the HTMT ratios were less than the recommended threshold of .90 (Henseler et al., 2015). Tables 49 and 50 present the results of the two criteria for determining discriminant validity.

Table 49: Fornell-Larcker Criterion for the PLS-SEM Model without Moderators

	ASE	AEG	CLB	EGO	IGO	MAP	MAV	PAP	PAV	SRL	TA	TVO
ASE	**0.752**											
AEG	0.345	**0.760**										
CLB	0.657	0.332	**0.726**									
EGO	0.569	0.239	0.506	**0.818**								
IGO	0.550	0.279	0.418	0.421	**0.737**							
MAP	0.682	0.334	0.522	0.558	0.556	**0.775**						
MAV	0.334	0.131	0.319	0.372	0.280	0.383	**0.849**					
PAP	0.354	0.325	0.311	0.478	0.210	0.355	0.402	**0.878**				
PAV	0.373	0.256	0.305	0.450	0.207	0.357	0.256	0.638	**0.893**			
SRL	0.637	0.649	0.528	0.494	0.491	0.599	0.284	0.381	0.401	**0.789**		
TA	0.212	0.107	0.205	0.298	0.160	0.302	0.214	0.259	0.282	0.234	**0.719**	
TVO	0.741	0.380	0.648	0.573	0.612	0.666	0.365	0.284	0.269	0.636	0.136	**0.771**

Source: Fieldwork (2023)

Table 50: HTMT Ratio for the PLS-SEM Model without Moderators

	ASE	AEG	CLB	EGO	IGO	MAP	MAV	PAP	PAV	SRL	TA	TVO
ASE												
AEG	0.430											
CLB	0.837	0.483										
EGO	0.664	0.282	0.654									
IGO	0.692	0.377	0.582	0.540								
MAP	0.866	0.462	0.729	0.753	0.804							
MAV	0.389	0.213	0.409	0.444	0.358	0.545						
PAP	0.414	0.388	0.413	0.571	0.267	0.464	0.472					
PAV	0.420	0.293	0.385	0.525	0.265	0.473	0.308	0.740				
SRL	0.709	0.763	0.651	0.555	0.599	0.753	0.319	0.425	0.433			
TA	0.253	0.174	0.260	0.381	0.220	0.421	0.281	0.399	0.350	0.269		
TVO	0.848	0.470	0.816	0.661	0.773	0.856	0.425	0.326	0.296	0.703	0.197	

Source: Fieldwork (2023)

Assessment of Common Method Bias (CMB)

In light of the cross-sectional nature of this study, two statistical approaches were employed to address common method bias (CMB) [Jordan & Troth, 2020; Memon, Thurasamy, Cheah, Ting, Chuah & Cham, 2023]. Firstly, Harman's single-factor test (Harman, 1976) was conducted, revealing that only 23.488% of the variance was accounted for by the first factor, which is below the 50% threshold (see Appendix L for detailed results). This result, as per Podsakoff et al. (2012), suggests that CMB is not a significant issue in the dataset.

Secondly, the occurrence of a variance inflation factor (VIF) greater than 3.3 is proposed as an indication of pathological collinearity, and also as an indication that a model may be contaminated by common method bias. Therefore, if all VIFs in the inner model resulting from a full collinearity test are equal to or lower than 3.3, the model can be considered free of common method bias (Kock, 2015). Table 51 shows the VIFs for the inner model.

Table 51: VIFs for the Inner Model

Structural Path	Inner Model VIF
ASE -> SRL	2.997
CLB -> SRL	2.020
EGO -> SRL	1.997
IGO -> SRL	1.733
MAP -> SRL	2.415
MAV -> SRL	1.347
PAP -> SRL	1.969
PAV -> SRL	1.839
SRL -> AEG	1.000
TA -> SRL	1.199
TVO -> SRL	3.187

Source: Fieldwork (2023)

The comprehensive collinearity testing results, presented in Table 51, indicated that the variance inflation factor (VIF) values ranged from 1.000 to

3.187, all falling below the threshold of 3.33 (Kock, 2015). This finding further supports the conclusion that CMB is not a concern in our data. Additionally, the VIF values were less than 5 which implies that multicollinearity is not a significant problem in this study (Ringle, Sarstedt, Sinkovics & Sinkovics, 2023).

Model Fit Indices

In their study, Schuberth, Rademaker and Henseler (2023) underscore the significance of evaluating results through the assessment of model fit, employing metrics like the NFI, and SRMR tests to gauge the suitability of the model. While there is no single perfect measure of how well a PLS-SEM model fits the data, Hair et al. (2017) suggest using the standardised root mean square residual (SRMR) as a useful indicator. Ideally, this value should be less than 0.08 for a good model fit (e.g., Hair, Hult, Ringle & Sarstedt, 2022). Table 52 shows the model fit indices.

Table 52: Model Fit Indices

Index	Acceptable Value/Condition	Actual Value (Saturated Model)	Estimated Model
SRMR	< 0.08	0.069	0.070
d_ULS	d_ULS < bootstrapped HI 95% of d_ULS and d_G < bootstrapped HI 95% of d_G	6.612	6.830
d_G		1.820	1.832
Chi-Square		4648.151	4675.166
NFI	> 0.90	0.685	0.683

Note: SRMR = Standardised root mean square residual; d_ULS = Unweighted least squares; d_G = Geodesic discrepancies; NFI = Normed fit index

In Table 52, apart from the NFI which is less than the recommended threshold of .90, the SRMR values ($SRMR_{SM}$ = .069 and $SRMR_{EM}$ = .070) for the structural model were within the recommended threshold of 0.08 (Hair et al., 2022). Hence, it can be inferred that the model exhibits a favourable level of fit.

Assessment of Structural Model (without Moderators)

The assessment of the structural model includes collinearity among constructs, significance and relevance of the path coefficients, coefficient of determination, effect size and predictive relevance (Q^2). The highest variance inflation factor of the structural model has a value of 3.187 (see Table 51), which is clearly below the threshold of 5 (Ringle at el., 2023). Hence, collinearity does not represent a critical issue for the results. Furthermore, the PLS-SEM results were used to examine the hypothesised relationships between the constructs. Significance testing uses the bootstrapping with 10,000 sub-samples (Becker et al., 2023; Hair et al., 2022; Streukens & Leroi-Werelds, 2016). This structural model reveals the results for research hypotheses three and four. Table 53 presents the results of the structural model without moderators.

Table 53: Assessment of Structural Model without Moderators

	Original Sample (β)	Sample mean (M)	SD	T value	*p* values	R^2	f^2	LLCI 5.00%	ULCI 95.00%
ASE -> SRL	0.185	0.186	0.070	2.629	0.004		0.024	0.042	0.194
CLB -> SRL	0.070	0.07	0.051	1.375	0.085		0.005	-0.007	0.103
EGO -> SRL	-0.003	-0.002	0.052	0.054	0.478		0.000	-0.061	0.051
IGO -> SRL	0.082	0.085	0.054	1.518	0.065		0.008	-0.009	0.107
MAP -> SRL	0.154	0.150	0.054	2.826	0.002	0.525	0.021	0.044	0.166
MAV -> SRL	-0.048	-0.043	0.044	1.077	0.141		0.004	-0.081	0.013
PAP -> SRL	0.082	0.082	0.063	1.295	0.098		0.007	-0.015	0.123
PAV -> SRL	0.118	0.118	0.05	2.346	0.009		0.016	0.024	0.137
TA -> SRL	0.042	0.045	0.036	1.186	0.118		0.003	0.108	0.243
TVO -> SRL	0.259	0.255	0.058	4.442	<.001		0.044	0.166	0.386
SRL -> AEG	0.649	0.652	0.049	13.239	<.001	0.421	0.728	-0.014	0.062

Note: R-square Adjusted (SRL) = 0.515; R-square adjusted (AEG) = 0.420

From Table 53, the positive significant path coefficient between ASE and SRL (ASE -> SRL) [β = .185, t = 2.629, p = .004] shows that ASE positively influences students' SRL. This implies that a 1% increase in standard deviation in ASE is likely to increase the standard deviation in SRL by 18.5%. In addition, the effect size reveals that ASE has a small effect (f^2 = .024) on SRL. As posited by Cohen (1988), Chin (1998) and Chin (2010), effect sizes are deemed small, medium, and large when surpassing the thresholds of 0.02, 0.15, and 0.35, respectively.

Also, the results from Table 53 indicate that there is a positive significant influence of MAP on SRL (MAP -> SRL) [β = .154, t = 2.826, p = .002]. This indicates that a 1% rise in the standard deviation of MAP is expected to result in a 15.4% increase in the standard deviation of SRL. The effect size of .021 implies that MAP has a small effect on SRL (Chin, 2010).

In addition, the results showed that PAV had a significant effect on SRL (PAV -> SRL) [β = .118, t = 2.346, p = .009]. This suggests that a one unit increase in PAV will lead to .118 increase in SRL. The magnitude of the effect was small (f^2 = .016).

Moreover, the positive significant path coefficient between TVO and SRL (TVO -> SRL) [β = .259, t = 4.442, p < .001], shows that TVO positively influences students' SRL. This implies that a 1% increase in TVO's standard deviation will lead to a 25.9% increase in the standard deviation of SRL. The effect size of .044 suggests that TVO has small influence on SRL (Chin, 2010).

However, from the model, it can be observed that CLB (β = .070, t = 1.375, p > .05), EGO (β = -.003, t = 0.054, p > .05), IGO (β = .082, t = 1.518,

$p > .05$), MAV [β = -.048, t = 1.077, $p > .05$], PAP [β = .082, t = 1.295, $p > .05$], and TA [β = .042, t = 1.186, $p > .05$] had no significant effect on SRL.

The adjusted coefficient of determination (R^2) of 0.515 revealed that ASE, MAP, PAV and TVO account for 51.5% of the variation in SRL. According to Hair, Sarstedt, Ringle and Gudergan (2024), and Hair, Hult, Ringle, and Sarstedt (2022), R-square (R^2) values of 0.25, 0.50 and 0.75 are interpreted as weak, moderate and substantial, respectively. Hence, ASE, MAP, PAV and TVO moderately explained 51.5% of the variation in SRL. This result implies that other factors not included in the model may account for 48.5% of the variation in Economics students' SRL.

Furthermore, the structural model examined the influence of Economics students' SRL on their AEG (SRL -> AEG). In Table 53, the results show that SRL has a significant positive influence on AEG (β = .649, t = 13.239, $p < .001$). Again, the magnitude (f^2 = .728) of the effect revealed that SRL substantially influenced AEG. The adjusted R^2 value of 0.420 showed that SRL explain 42.0% of the variance in AEG. This suggests that other variables that are not captured in the model may account for 58.0% of the variation in Economics students' AEG. Figure 19 displays the PLS-SEM bootstrapping results for the structural model without moderators.

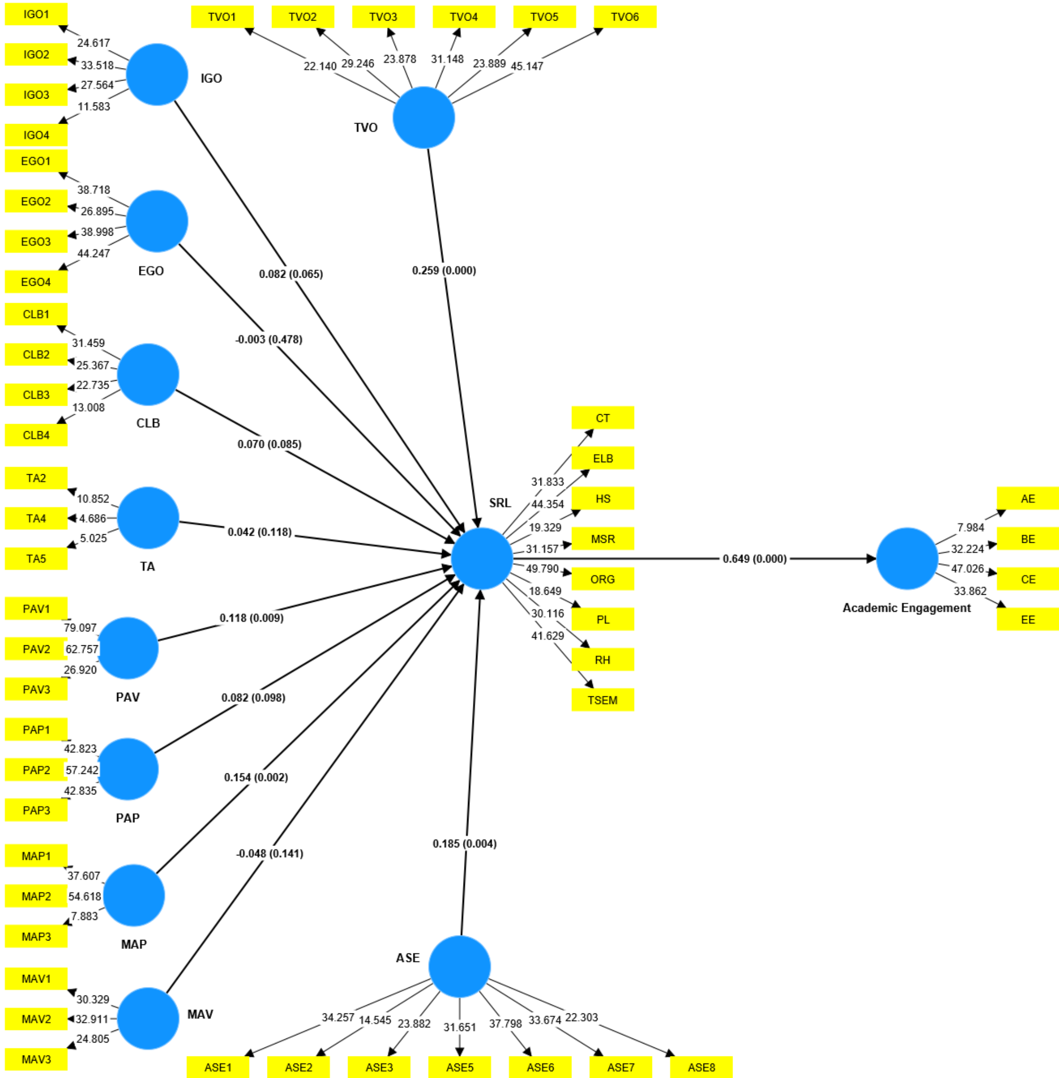


Figure 19: PLS-SEM Bootstrapping Results for the Structural Model without moderators
Source: Fieldwork (2023)

Predictive Relevance

To assess the out of sample predictive relevance, this study ran the PLSpredict procedure (Shmueli et al., 2019). All Q^2 predict values in Table 54 are larger than zero, indicating the model's superiority over a naïve prediction. The PLS-SEM errors are not normally distributed nor highly nonsymmetrical. Hence, this study uses the root mean square error (RMSE) to compare the predictive power of PLS-SEM with that of the linear model (LM).

Table 54: PLSpredict Assessment of Manifest Variables

	PLS-SEM RMSE	$Q^2_{predict}$	LM RMSE	$RMSE_{PLS-SEM} - RMSE_{LM}$
AE	1.031	0.060	0.986	0.045
BE	0.918	0.161	0.933	-0.015
CE	0.937	0.128	0.941	-0.004
EE	0.935	0.129	0.917	0.018
CT	0.854	0.273	0.864	-0.010
ELB	0.732	0.467	0.726	0.006
HS	0.921	0.156	0.957	-0.036
MSR	0.799	0.364	0.823	-0.024
ORG	0.815	0.339	0.804	0.011
PL	0.932	0.136	0.958	-0.026
RH	0.799	0.365	0.827	-0.028
TSEM	0.831	0.312	0.864	-0.033

Note: RMSE = Root Mean Square Error, LM = Linear Regression Model
Source: Fieldwork (2023)

From Table 54, it can be seen that the differences between the PLS-SEM RMSE and LM RMSE ($RMSE_{PLS-SEM} - RMSE_{LM}$) are negative. This result implies that except for four variables that had higher $RMSE_{PLS-SEM}$ than that of $RMSE_{LM}$, all indicators in the PLS-SEM analysis have lower RMSE values than those of the LM values. According to Shmueli et al. (2019), and Hair, Howard and Nitzl (2020), if the indicators in the PLS-SEM analysis have lower RMSE (or MAE) values compared to the naive LM benchmark, the model has predictive relevance. According to Table 54, the PLS-based prediction yields more accurate out-of-sample predictions (i.e., smaller prediction errors) for most indicators. Therefore, the model has medium predictive power.

Also, in SmartPLS, evaluating the model's predictive efficacy involves employing the blindfolding procedure. Consequently, if the Q^2 value exceeds zero; it is indicative of the model possessing predictive relevance for a specific endogenous construct (Hair et al., 2014; Richter, Sinkovics, Ringle &

Schlägel, 2016). Table 55 presents the Q^2 values for academic engagement and self-regulated learning.

Table 55: Q-square value of AEG and SRL

Constructs	Q^2predict	RMSE	MAE
Academic Engagement	0.165	0.923	0.644
SRL	0.493	0.719	0.536

Source: Fieldwork (2023)

As presented in Table 55, the calculated values for predictive relevance in the current study surpass zero, measuring at 0.165 and 0.493. Q-square values of 0.02, 0.15, and 0.35 denote levels of predictive relevance characterised as weak, moderate, and strong, respectively (Richter et al., 2016). Thus, the model exhibited predictive capability ranging from moderate to strong.

Robustness Checks

Linearity Assumption Test using Quadratic Effect (QE) and ANOVA

The Linearity Assumption Test using Quadratic Effect (QE) is a crucial aspect of Structural Equation Modeling (SEM), particularly in the context of SmartPLS. In SEM, one of the fundamental assumptions is that the relationships between variables are linear. This means that changes in the independent variables should lead to proportional and linear changes in the dependent variables. However, real-world data often presents situations where linear relationships may not hold true, and nonlinear patterns may be hidden within the data. This is where the Quadratic Effect (QE) comes into play. It is a technique used to assess whether there are quadratic or nonlinear relationships between variables in the PLS-SEM model. In SmartPLS, this can be a valuable analysis tool. If the path coefficients for the quadratic effects are significant, it suggests that there is a nonlinear relationship between the variables in question. In other words, the relationship is not purely linear.

The Linearity Assumption Test using Quadratic Effect in SmartPLS SEM is valuable for exploring nonlinear relationships between variables in your structural equation model (Hair, Sarstedt, Ringle & Gudergan, 2023). It allows you to go beyond the basic linear assumptions and gain a deeper understanding of the complexities within your data.

Table 56: Linearity Assumption Test using Quadratic Effect in SmartPLS SEM

	Original sample (β)	Sample mean (M)	SD	T values	p values
QE (TVO) -> SRL	0.011	0.011	0.047	0.240	0.405
QE (TA) -> SRL	0.037	0.039	0.025	1.487	0.068
QE (PAP) -> SRL	-0.015	-0.014	0.040	0.366	0.357
QE (ASE) -> SRL	-0.024	-0.027	0.049	0.478	0.316
QE (EGO) -> SRL	-0.026	-0.021	0.038	0.684	0.247
QE (CLB) -> SRL	-0.020	-0.016	0.034	0.591	0.277
QE (PAV) -> SRL	-0.003	-0.007	0.033	0.082	0.467
QE (MAP) -> SRL	-0.123	-0.116	0.040	3.109	0.001
QE (IGO) -> SRL	0.127	0.124	0.046	2.759	0.003
QE (MAV) -> SRL	0.052	0.048	0.035	1.504	0.066
QE (SRL) -> AEG	0.053	0.050	0.049	1.086	0.139

Source: Fieldwork (2023)

In Table 56, the results show that the path coefficients for MAP -> SRL and IGO -> SRL for the quadratic effects are significant ($p < .05$). Hence, it suggests that there is a nonlinear relationship between the variables MAP and SRL, and IGO and SRL (Sarstedt, Ringle, Cheah, Ting, Moisescu & Radomir, 2020). Figure 20 depicts the linearity assumption using quadratic effect model.

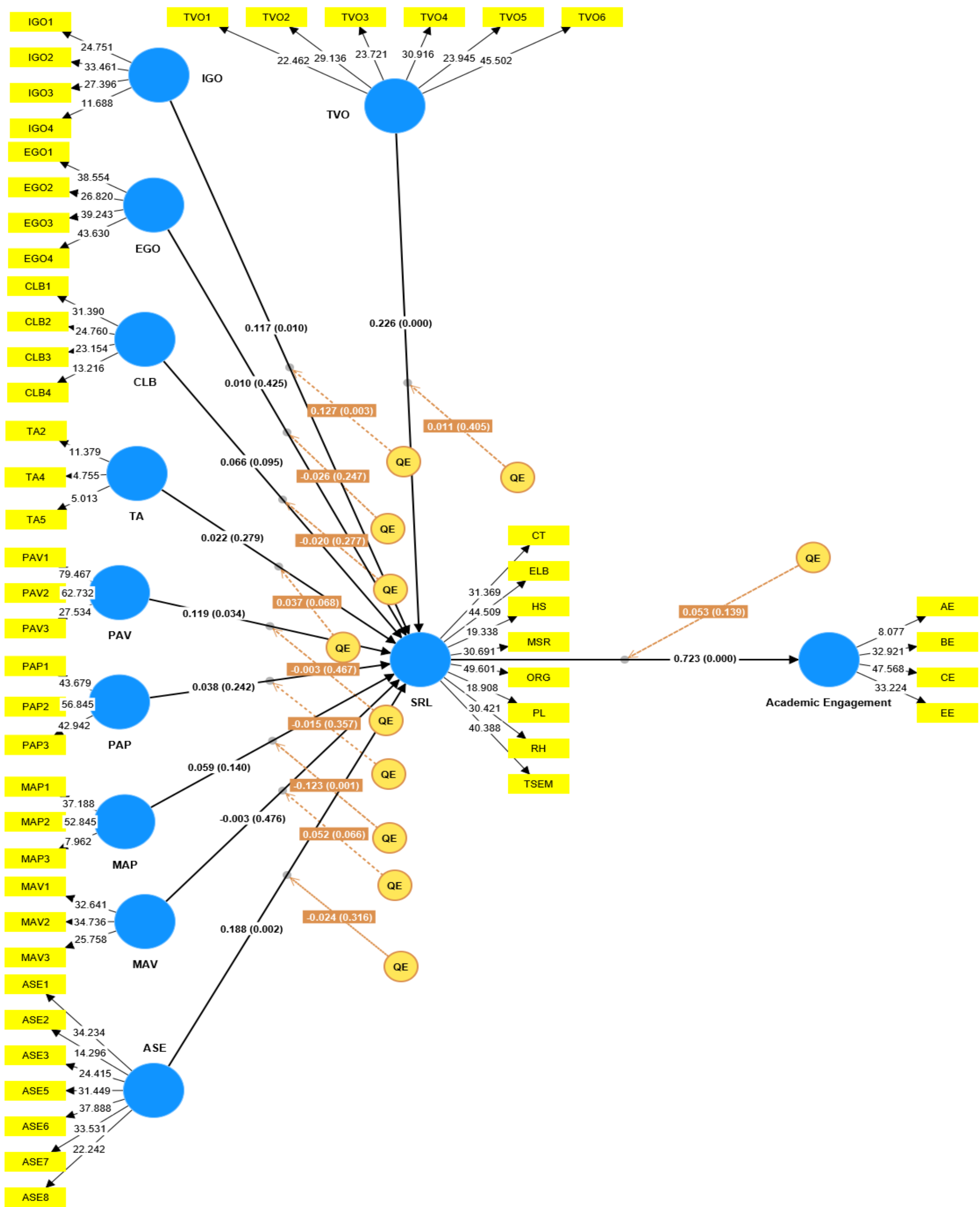


Figure 20: Quadratic Effect Model for Linearity Assumption
Source: Fieldwork (2023)

Also, the Analysis of Variance (ANOVA) was utilised to examine the linearity of the relationships, as recommended by Leong, Hew, Ooi, and Dwivedi (2020). The outcomes outlined in Table 57 suggest non-linear connections between the dependent and independent variables. These results confirms that of the quadratic effect from the PLS-SEM. Hence, this warranted the use of artificial neural network approach to augment the results from the PLS-SEM. Table 57 shows the results of the ANOVA test for linearity.

Table 57: ANOVA Test for Linearity

			Sum of Squares	df	Mean Square	F	Sig.
AEG * SRL	Between Groups	(Combined)	174.394	326	0.535	56.624	.000
		Linearity	53.268	1	53.268	5638.309	.000
		Deviation from Linearity	121.126	325	0.373	39.449	.000
	Within Groups		1.181	125	0.009		
SRL* IGO	Between Groups	(Combined)	31.685	16	1.98	11.044	.000
		Linearity	26.574	1	26.574	148.209	.000
		Deviation from Linearity	5.111	15	0.341	1.9	.021
	Within Groups		77.996	435	0.179		
SRL* EGO	Between Groups	(Combined)	35.922	16	2.245	13.241	.000
		Linearity	22.204	1	22.204	130.951	.000
		Deviation from Linearity	13.718	15	0.915	5.393	.000
	Within Groups		73.759	435	0.17		
SRL* TVO	Between Groups	(Combined)	50.685	21	2.414	17.592	.000
		Linearity	45.348	1	45.348	330.531	.000
		Deviation from Linearity	5.337	20	0.267	1.945	.009
	Within Groups		58.996	430	0.137		
SRL* CLB	Between Groups	(Combined)	42.833	16	2.677	17.421	.000
		Linearity	30.52	1	30.52	198.604	.000
		Deviation from Linearity	12.313	15	0.821	5.342	.000
	Within Groups		66.848	435	0.154		
SRL* ASE	Between Groups	(Combined)	55.559	28	1.984	15.508	.000
		Linearity	44.855	1	44.855	350.574	.000
		Deviation from Linearity	10.704	27	0.396	3.099	.000
	Within Groups		54.122	423	0.128		
SRL * TA	Between Groups	(Combined)	12.708	19	0.669	2.98	.000
		Linearity	1.932	1	1.932	8.608	0.004
		Deviation from Linearity	10.776	18	0.599	2.667	.000
	Within Groups		96.973	432	0.224		
SRL * MAP	Between Groups	(Combined)	42.94	12	3.578	23.537	.000
		Linearity	36.716	1	36.716	241.506	.000
		Deviation from Linearity	6.224	11	0.566	3.722	.000
	Within Groups		66.741	439	0.152		

Table 57: Cont'd

SRL * MAV	Between Groups	(Combined)	18.722	12	1.56	7.53	.000
		Linearity	6.411	1	6.411	30.942	.000
		Deviation from Linearity	12.311	11	1.119	5.401	.000
	Within Groups		90.959	439	0.207		
SRL * PAP	Between Groups	(Combined)	20.815	12	1.735	8.569	.000
		Linearity	13.544	1	13.544	66.907	.000
		Deviation from Linearity	7.271	11	0.661	3.265	.000
	Within Groups		88.866	439	0.202		
SRL * PAV	Between Groups	(Combined)	23.488	12	1.957	9.969	.000
		Linearity	14.598	1	14.598	74.349	.000
		Deviation from Linearity	8.89	11	0.808	4.116	.000
	Within Groups		86.193	439	0.196		

Source: Fieldwork (2023)

Artificial Neural Network Approach

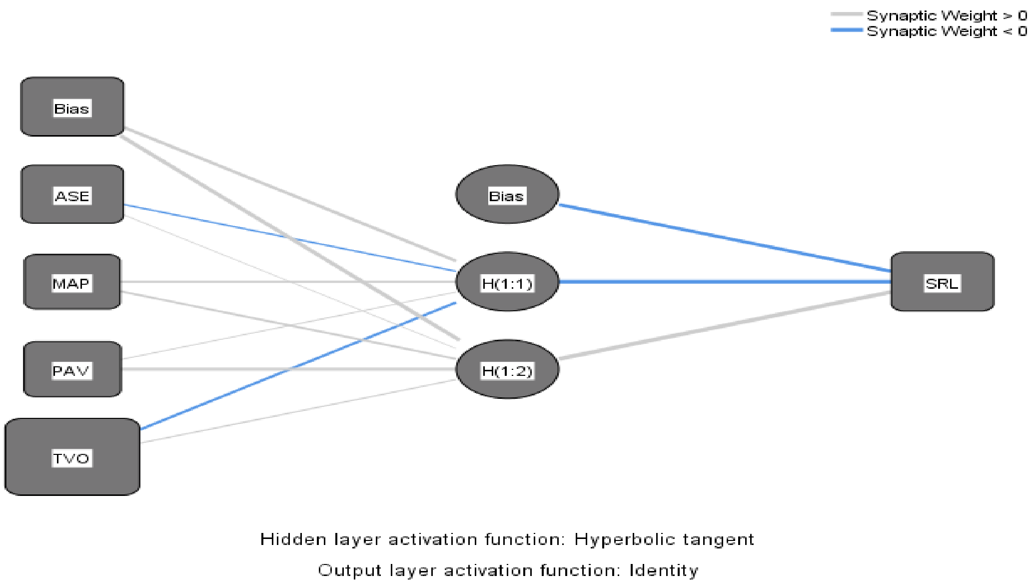
The integration of the artificial neural network (ANN) and PLS-SEM demonstrates a harmonious relationship, with PLS-SEM serving as a logical foundation for the ANN. Additionally, ANN offer an efficient approach for estimating parameters related to structural model relations (Sarstedt & Liu, 2023). Researchers have utilised the construct scores generated by the PLS-SEM algorithm as inputs for ANN, which simulates information processing through distinct layers of neurons that resemble the brain's nervous system (Sarstedt & Liu, 2023).

The selection of the ANN method in this study was informed by prior research demonstrating superior efficiency in discerning both linear and nonlinear relationships compared to traditional statistical techniques such as multiple linear regression, logistic regression, and SEM (Al-Sharafi et al., 2022; Arpaci et al., 2022). The neural network model employed in this study consisted of an input layer, one or more hidden layers, and an output layer, with a sigmoid function serving as the activation function for both output and hidden neurons. The input and output neurons were constrained within the range [0, 1] to optimise the model's performance, following the approach outlined in a previous study (Kalinic et al., 2021). A ten-fold cross-validation technique was applied to the ANN models to prevent overfitting, consistent with the protocols established by Alam et al. (2021) and Kalinic et al. (2021). In line with the data allocation protocols established by prior research, 90% of the data was allocated for training, with the remaining 10% earmarked for testing purposes (Alam et al., 2021; Kalinic et al., 2021).

In this study, the first ANN model has four input layers (ASE, MAP, PAV, and TVO) and one output (SRL) layer. The following specifications were used for the neural network model:

SRL = f (ASE, MAP, PAV, TVO)…………………………………………ANN Model 1.

Figure 21 shows the ANN model for the influence of motivational orientations on Economics students' self-regulated learning.



Note: ASE = academic self-efficacy; MAP = mastery approach; PAV = performance avoidance; TVO = task value orientation; and SRL = self-regulated learning

Figure 21: Artificial Neural Network (ANN) Model for *SRL = f (ASE, MAP, PAV, TVO)*

Source: Fieldwork (2023)

Additionally, the root mean square error (RMSE) was calculated for the ten neural networks, as indicated by Wang et al. (2022). Table 58 presents the mean RMSE values for both the training and testing phases, revealing consistently small values within the range of 0.331–0.610, as reported by Lee et al. (2020). Based on these findings, it can be deduced that the ANN model exhibited a high level of accuracy and fitness. Table 58 shows the number of samples, SSE and RMSE values during the Training and Testing stages for ANN model 1.

Table 58: Number of samples, SSE and RMSE values for Training and Testing Stages in a Ten-Fold ANN (Model 1)

	Model 1						
	Input Neurons: ASE, MAP, PAV and TVO						
	Output node: SRL						
	Training			Testing			
Neural Network	N	SSE	RMSE	N	SSE	RMSE	TSS
1st	402	92.653	0.480	50	13.170	0.513	452
2nd	407	95.727	0.485	45	7.282	0.402	452
3rd	404	100.207	0.498	48	15.031	0.560	452
4th	393	101.167	0.507	59	12.961	0.469	452
5th	396	100.459	0.504	56	12.605	0.474	452
6th	410	107.192	0.511	42	4.607	0.331	452
7th	401	101.037	0.502	51	17.23	0.581	452
8th	405	116.851	0.537	47	8.07	0.414	452
9th	400	100.001	0.500	52	15.822	0.552	452
10th	406	100.791	0.498	46	17.096	0.610	452
Mean		101.6085	0.5023		12.3874	0.4906	
SD		6.2078	0.0147		4.1308	0.0843	

Note: N = Sample size; SSE = Sum of Square Error, RMSE = Root Mean Square of Errors; TSS = Total Sample Size
Source: Fieldwork (2023)

Also, the RMSE for the training and testing data are displayed by Figure 22.

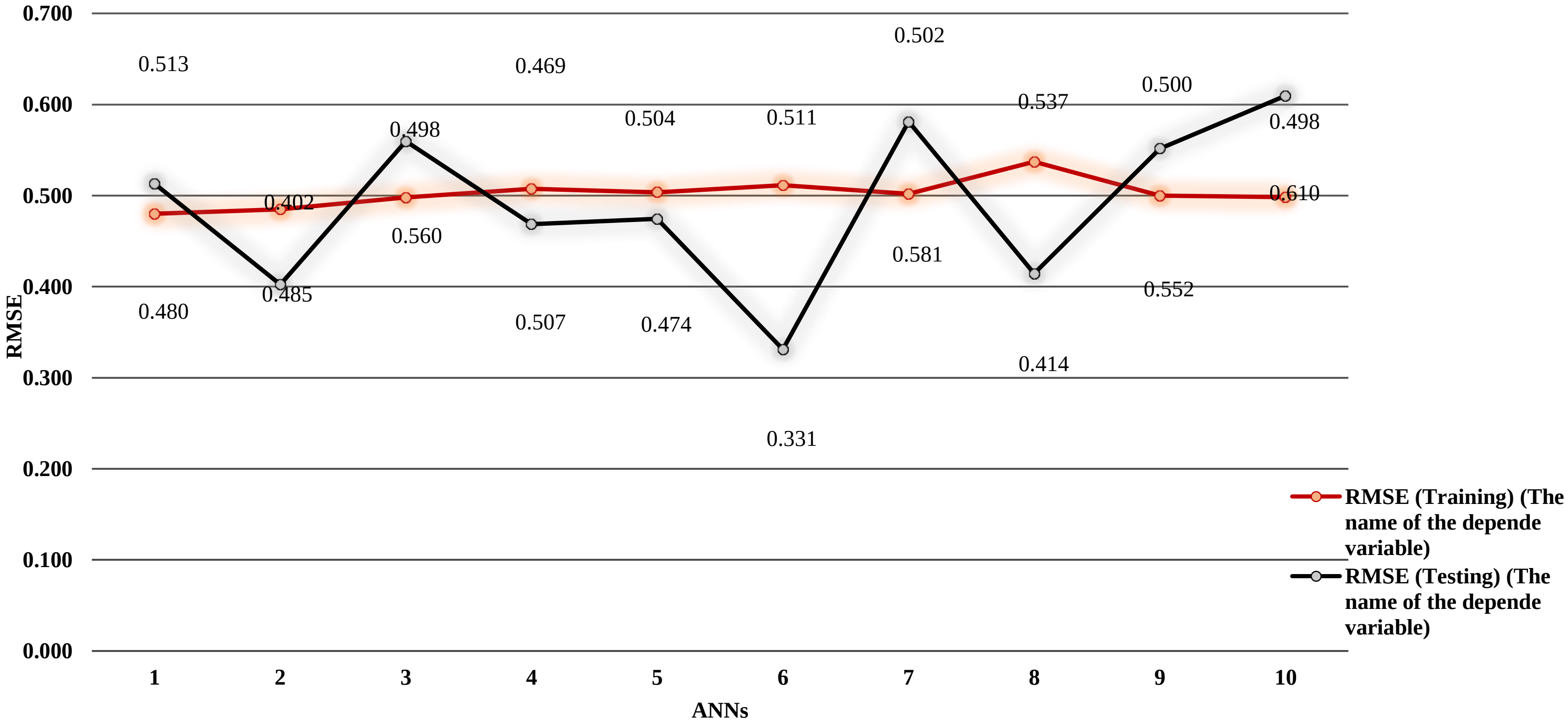


Figure 22: RMSE for Testing and Training for ANN Model 1
Source: Fieldwork (2023)

Moreover, sensitivity analysis was for performed to evaluate the normalised relative importance of the exogenous variables (Lim, Lee, Foo, Ooi & Wei–Han Tan, 2022). Table 59 shows the sensitivity analysis for ANN model 1.

Table 59: Sensitivity Analysis for ANN Model 1

	Model 1 (Output: SRL)			
	ASE	MAP	PAV	TVO
NI1	0.49	0.39	0.41	1.00
NI2	0.48	0.66	0.66	1.00
NI3	1.00	0.57	0.78	0.98
NI4	0.69	0.47	0.46	1.00
NI5	0.54	0.61	0.42	1.00
NI6	0.91	0.42	0.31	1.00
NI7	0.6	0.61	0.46	1.00
NI8	0.81	1.00	0.32	0.95
NI9	0.76	0.66	0.47	1.00
NI10	0.71	0.86	0.61	1.00
AI	0.69	0.62	0.48	0.99
IP	0.70	0.63	0.49	1.00

Note: NI = Normalised Importance, AI = Average Importance and IP = Importance/Normalised Relative Importance
Source: Fieldwork (2023)

The sensitivity analysis for ANN Model 1, as shown in Table 59, demonstrates that task value orientation (100%) is the most crucial component in determining Economics students self-regulated learning, which aligns with the results of the structural model (TVO → SRL, β = 0.259***) [see Table 53]. This was followed by ASE at a percentage of 70%. MAP ranked third (63%), followed by PAV (49%).

This study utilised a methodology akin to the approach employed by Ferasso and Alnoor (2022) to compute the R^2 value of the ANN model. The results revealed that the ANN model can predict Economics students' SRL with an impressive accuracy of 96.04%. Notably, the R^2 value achieved by the

ANN model surpassed that of PLS-SEM, registering at 56.2%. Equation (1) illustrates the R-squared result.

$R^2 = 1 - \frac{RMSE}{S_y^2} = 1 - \frac{.4906}{12.3874} = 1 - 0.0396 = 0.9604$ (96.04% approximately 96%) [1]

In equation (1), RMSE and S_y^2 are the average RMSE and SSE respectively under the testing stage. According to Ferasso and Alnoor (2022), the R^2 reveals the prediction accuracy of the ANN model. A comparison was made between PLS-SEM and ANN model, utilising path coefficients and normalised relative importance (Ng et al., 2022), as shown in Table 60. Table 60 effectively illustrates the divergent results obtained by applying these two models.

Table 60: Comparison between PLS-SEM and ANN Results for Model 1

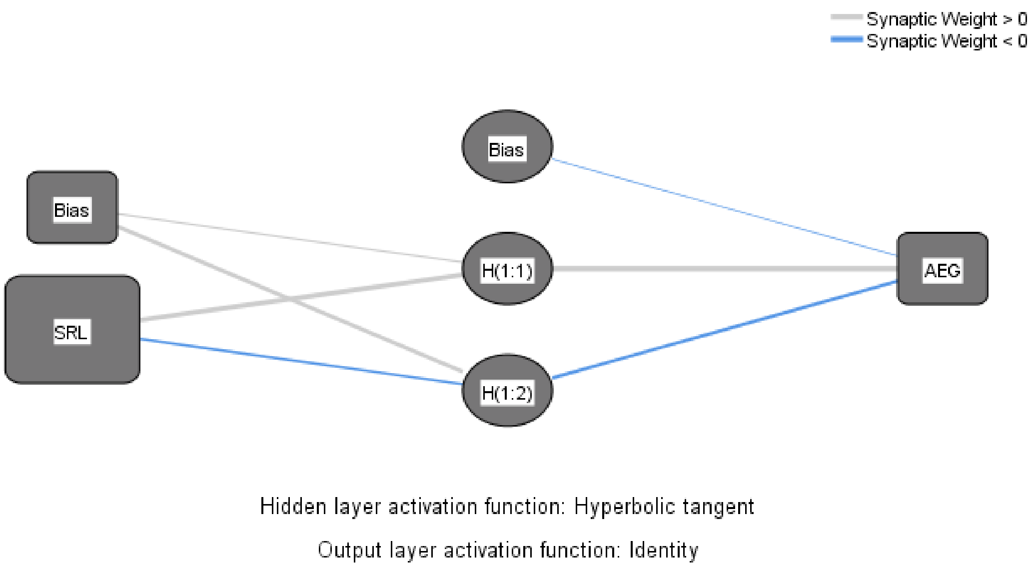
Construct	Path Coefficient	PLS-SEM Ranking	ANN – Normalised Relative Importance (%)	ANN Ranking	Matching PLS-SEM with ANN
ASE	0.185	2	70.00	2	Match
MAP	0.154	3	63.00	3	Match
PAV	0.118	4	49.00	4	Match
TVO	0.259	1	100.00	1	Match

Source: Fieldwork (2023)

The results from Table 60 reveal that ASE, MAP, PAV and TVO are ranked similarly in both the PLS-SEM analysis and the ANN model.

ANN Model for SRL and AEG (Model 2)

This section presents the results of the ANN model for the influence of SRL on AEG. Figure 23 shows the ANN model for SRL and AEG



Note: SRL = self-regulated learning and AEG = academic engagement
Figure 23: ANN Model for SRL and AEG (Model 2)
Source: Fieldwork (2023)

Table 61 shows the number of samples, SSE and RMSE values during the training and testing stages for ANN model 2.

Table 61: Number of samples, SSE and RMSE values during the Training and Testing Stages (Model 2)

	Model 2						
	Input Neuron: SRL						
	Output node: AEG						
	Training			Testing			
Neural Network	N	SSE	RMSE	N	SSE	RMSE	TSS
1st	402	113.808	0.532	50	9.910	0.445	452
2nd	407	118.349	0.539	45	8.835	0.443	452
3rd	404	118.358	0.541	48	15.246	0.564	452
4th	393	111.831	0.533	59	19.195	0.570	452
5th	396	113.982	0.537	56	15.599	0.528	452
6th	410	117.324	0.535	42	5.148	0.350	452
7th	401	116.826	0.540	51	20.164	0.629	452
8th	405	118.634	0.541	47	14.453	0.555	452
9th	400	119.618	0.547	52	16.331	0.560	452
10th	406	114.961	0.532	46	12.712	0.526	452
Mean		116.3691	0.5377		13.7593	0.5170	
SD		2.5716	0.0048		4.6854	0.0814	

Source: Fieldwork (2023)

Table 62 shows the sensitivity analysis for ANN model 2.

Table 62: Sensitivity Analysis for ANN Model 2

	Model 2 (Output: AEG)
	SRL
NI1	1.00
NI2	1.00
NI3	1.00
NI4	1.00
NI5	1.00
NI6	1.00
NI7	1.00
NI8	1.00
NI9	1.00
NI10	1.00
AI	1.00
IP	1.00

Source: Fieldwork (2023).

$R^2 = 1 - \frac{RMSE}{S_y^2} = 1 - \frac{.5170}{13.7593} = 1 - 0.0376 = 0.9624$ (96.24% approximately 96%) [2]

In equation (2), RMSE and S_y^2 are the average RMSE and SSE respectively under the testing stage. The results revealed that the ANN model can predict Economics students' AEG with a precision level of 96.04%. Figure 24 displays the RMSE for testing and training for ANN Model 2

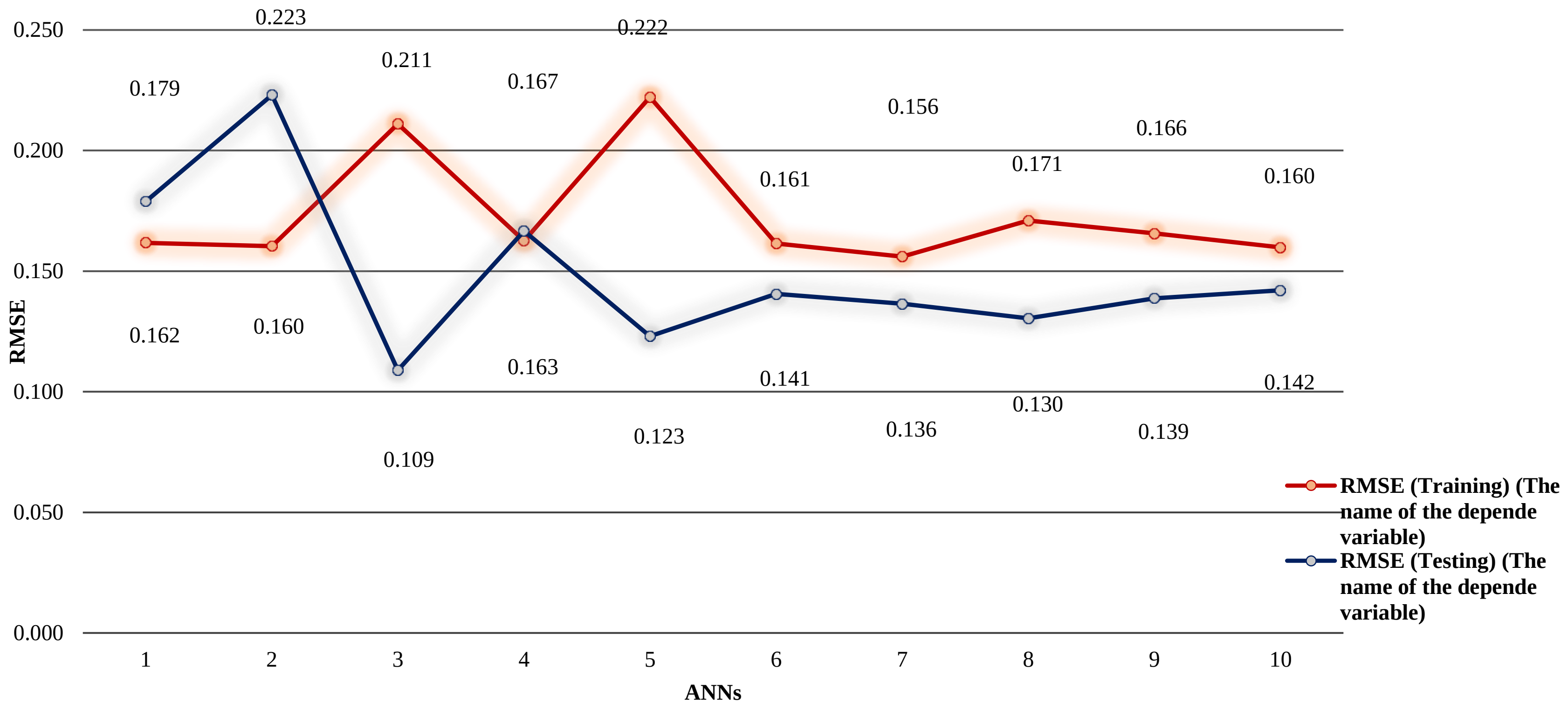


Figure 24: RMSE for Testing and Training for ANN Model 2
Source: Fieldwork (2023)

Influence of SRL dimensions on AEG

In this section, the influence of SRL dimensions on AEG was examined. Since, self-regulated learning is composed of nine (9) domains such as RH = Rehearsal; ELB = Elaboration; ORG = Organisation; CT = Critical Thinking; MSR = Metacognitive Self-Regulation; TSEM = Time and Study Environment Management; ER = Effort Regulation; PL = Peer Learning; and HS = Help Seeking, then it remains unknown as to which one significantly predicted academic engagement. Hence, the influence of self-regulated learning dimensions on academic engagement was examined. Before the effect was examined, multicollinearity diagnosis was conducted on the dimensions. The results are presented in Table 63.

Table 63: Multicollinearity Results for Self-Regulated Learning Dimensions

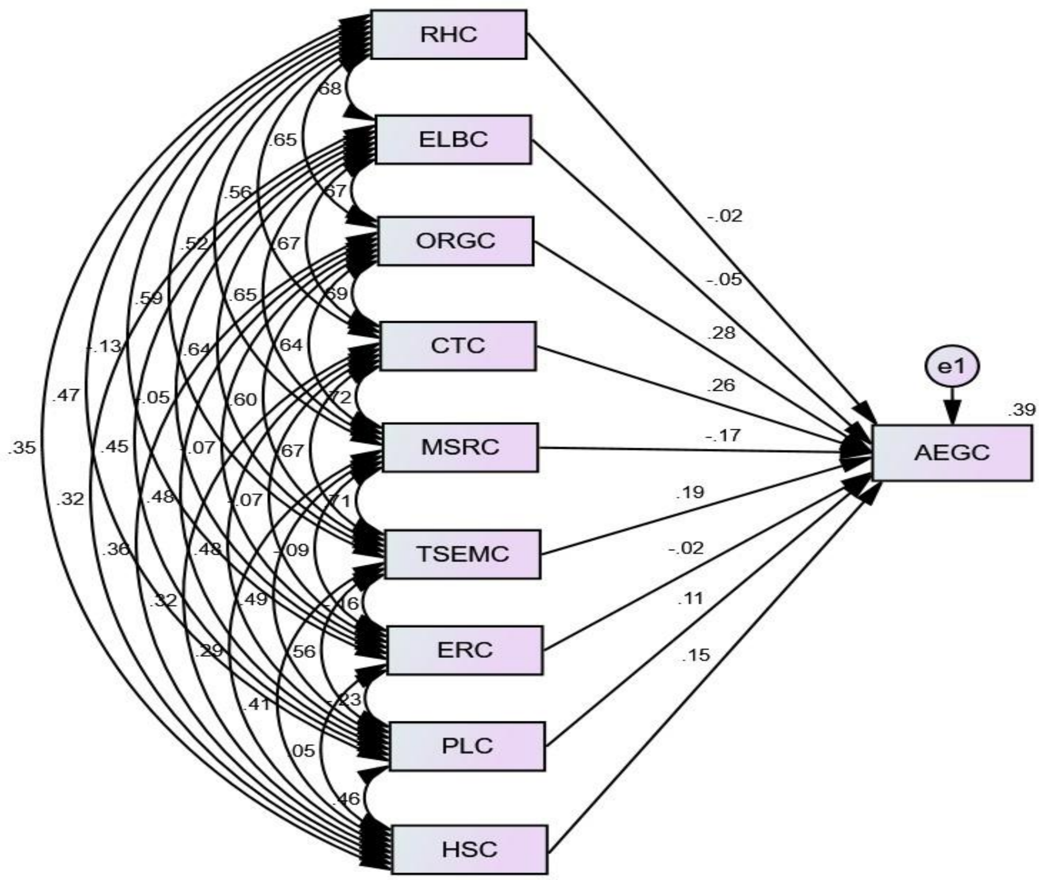
	RH	ELB	ORG	CT	MSR	TSEM	ER	PL	HS
RH	1								
ELB	.684**	1							
ORG	.650**	.673**	1						
CT	.559**	.666**	.693**	1					
MSR	.521**	.654**	.637**	.722**	1				
TSEM	.587**	.637**	.596**	.668**	.712**	1			
ER	-.127**	-.046	-.068	-.068	-.087	-.158**	1		
PL	.472**	.447**	.482**	.483**	.487**	.556**	-.231**	1	
HS	.348**	.321**	.356**	.318**	.285**	.406**	.048	.459**	1

Source: Fieldwork (2023) **$p < 0.01$ (2-tailed).

Sweeney and Williams (2005) define multicollinearity as the condition where the correlation coefficient between variables surpasses 70%. Consequently, within the realm of self-regulated learning dimensions, multicollinearity is observable, given that the correlation coefficients for MSR and CT ($r = .722$, $p < .01$) and TSEM and MSR ($r = .712$, $p < .01$) surpass the 70% threshold. These findings suggest a substantial interrelationship among specific SRL dimensions. The presence of covariance imposes limitations on the efficacy of Smart PLS-SEM, as it neglects to address covariance between variables while establishing their impacts on an endogenous (outcome) construct. Subsequently, $\mathrm{CB-SEM_{AMOS}}$ was employed in this study to determine the influence of self-regulated learning dimensions on academic engagement.

SEM results from AMOS

The structural model in Figure 25 presents the influence of the self-regulated learning dimensions on academic engagement.



Note: RHC = rehearsal; ELBC = elaboration; ORGC = organisation; CTC = critical thinking; MSRC = metacognitive self-regulation; TSEMC = time and study environment management; ERC = effort regulation; PLC = peer learning; and HSC = help seeking and AEGC = academic engagement.

Figure 25: Structural model from AMOS showing the influence of SRL dimensions on academic engagement.

Source: Fieldwork (2023).

Table 64 shows the results of the influence of SRL dimensions on academic engagement.

Table 64: Influence of SRL Dimensions on Academic Engagement (AEG)

Path	*B*	*β*	SE	CR	*p* value	f^2	95% CI	
							LLCI	ULCI
Constant	1.342		.191	7.029	<.001		.767	1.997
RH -> AEG	-.016	-.022	.041	-.398	.691	0.002	-.134	.089
ELB -> AEG	-.046	-.053	.053	-.871	.384	0.003	-.171	.071
ORG -> AEG	.235	.280	.050	4.717	<.001	0.051	.139	.419
CT -> AEG	.248	.264	.058	4.280	<.001	0.041	.143	.380
MSR -> AEG	-.155	-.169	.057	-2.738	.006	0.018	-.320	-.027
TSEM -> AEG	.173	.188	.056	3.092	.002	0.021	.065	.314
ER -> AEG	-.012	-.021	.021	-.536	.592	0.002	-.093	.056
PL -> AEG	.087	.115	.037	2.326	.020	0.013	.032	.205
HS -> AEG	.166	.148	.049	3.393	<.001	0.026	.041	.251

Note: *B* = unstandardised path coefficient; *β* = standardised path coefficient; SE = standard error; f^2 = effect size; squared multiple correlations (R-squared [R^2]) = .391; CI = confidence intervals; LLCI = lower limit confidence intervals; ULCI = upper limit confidence intervals.
Source: Fieldwork (2023).

In Table 64, the unstandardised regression estimates showed a significant positive influence of organisation (*B* = .235, C.R. = 4.717, $p < .001$, 95% CI [.139, .419]), critical thinking (*B* = .248, C.R. = 4.280, $p < .001$, 95% CI [.143, .380]), time and study environment management (*B* = .173, C.R. = 3.092, $p < .05$, 95% CI [.065, .314]), peer learning (*B* = .087, C.R. = 2.326, $p < .05$, 95% CI [.032, .205]), and help seeking (*B* = .166, C.R. = 3.393, $p < .001$, 95% CI [.041, .251]) on academic engagement. This shows that some of the self-regulated learning dimensions have a statistically significant positive influence on academic engagement. Surprisingly, metacognitive self-regulation (*B* = -.155, C.R. = -2.738, *p* < .05, 95% CI [-.320, -.027]) had a significant negative influence on academic engagement.

However, rehearsal (*B* = -.016, C.R. = -.398, *p* > .05, 95% CI [-.134, .089]), elaboration (*B* = -.046, C.R. = -.871, *p* > .05, 95% CI [-.171, .071]) and effort regulation (*B* = -.012, C.R. = -.536, *p* > .05, 95% CI [-.093, .056]) had no significant influence on academic engagement.

The squared multiple correlation coefficients (R^2) indicated that ORG, CT, MSR, TSEM, PL, and HS explained .391 or 39.1% of variance in Economics students' academic engagement. This suggests that the identified factors did not explain 60.9% of variance in the academic engagement of Economics students.

The effect size was calculated by using the following formula:

$$f^2 = \frac{R^2_{included} - R^2_{excluded}}{1 - R^2_{included}} \text{......................Equation 1}$$

The effect size values for the significant exogenous variables, ranging from 0.013 to 0.051 showed a small effect (Cohen, 1988). The model depicting the observed relationship is as follows:

AEG = 1.342 + .235ORG + .248CT − .155MSR + .173TSEM + .087PL + .166HS………………………………………………………..Equation 2

Evaluation of Measurement Model for the Final PLS-SEM Model with Moderators

This involves assessments of the measurement model's indicator loadings, α, CR, AVE and discriminant validity as outlined by Hair et al. (2019). The item loadings were greater than the threshold of .40 (Hair et al., 2018). In summary, the results affirm the legitimacy of the measurement model. Also the α (e.g., α_{AEG} = .741; α_{ASE} = .869; α_{TVO} = .863) and CR (e.g.,

CR_{AEG} = .840; CR_{ASE} = .900; α_{TVO} = .897) values were above the threshold of 0.60. Additionally, the AVE values (e.g., AVE_{AEG} = .579; AVE_{ASE} = .565; AVE_{SRL} = .622) were above the threshold of .50 (Hair et al., 2022). Table 65 shows the measurement model for the final PLS-SEM model with moderators.

Table 65: Measurement model for the final PLS-SEM model with moderators

Constructs	Items	Indicator Loadings	CA (α)	CR (rho_a)	CR (rho_c)	AVE	VIF
AEG	AE	0.464	0.741	0.792	0.840	0.579	1.105
	BE	0.807					1.631
	CE	0.851					1.923
	EE	0.850					1.910
ASE	ASE1	0.796	0.869	0.875	0.900	0.565	2.060
	ASE2	0.590					1.347
	ASE3	0.724					1.598
	ASE5	0.776					1.911
	ASE6	0.825					2.424
	ASE7	0.804					2.187
	ASE8	0.723					1.709
CLB	CLB1	0.782	0.696	0.710	0.815	0.527	1.435
	CLB2	0.741					1.383
	CLB3	0.774					1.470
	CLB4	0.590					1.148
EGO	EGO1	0.846	0.837	0.845	0.890	0.670	2.761
	EGO2	0.801					2.484
	EGO3	0.811					1.844
	EGO4	0.815					1.730
Gender	-	1.000	-	-	-	-	1.000
IGO	IGO1	0.763	0.715	0.734	0.824	0.544	1.419
	IGO2	0.804					1.599
	IGO3	0.781					1.458
	IGO4	0.579					1.162
LAS	LAS1	0.831	0.891	0.891	0.920	0.696	2.570
	LAS2	0.852					2.809
	LAS3	0.868					2.868
	LAS4	0.819					2.586
	LAS5	0.801					2.397
MAP	MAP1	0.847	0.655	0.738	0.813	0.601	1.677
	MAP2	0.889					1.708
	MAP3	0.543					1.096
MAV	MAV1	0.856	0.809	0.816	0.886	0.721	2.442
	MAV2	0.874					2.543
	MAV3	0.817					1.394
PAP	PAP1	0.869	0.852	0.852	0.910	0.771	2.057
	PAP2	0.898					2.438
	PAP3	0.868					1.960
PAV	PAV1	0.916	0.874	0.900	0.922	0.797	2.563
	PAV2	0.912					2.499
	PAV3	0.850					2.123

Table 65: Cont'd

TA	TA2	0.844	0.611	0.695	0.759	0.516	1.064
	TA4	0.634					1.582
	TA5	0.659					1.619
TVO	TVO1	0.730	0.863	0.872	0.897	0.594	1.904
	TVO2	0.776					2.124
	TVO3	0.753					1.762
	TVO4	0.797					1.963
	TVO5	0.739					1.789
	TVO6	0.824					1.993
SRL	CT	0.792	0.912	0.918	0.929	0.622	2.356
	ELB	0.837					2.719
	HS	0.680					1.755
	MSR	0.826					3.020
	ORG	0.836					2.623
	PL	0.694					1.828
	RH	0.784					2.321
	TSEM	0.842					2.864
LAS x SRL	-	1.000	-	-	-	-	1.000
Gender x SRL	-	1.000	-	-	-	-	1.000

Source: Fieldwork (2023)

Figure 26 shows the PLS-SEM algorithm results for the measurement model with moderators

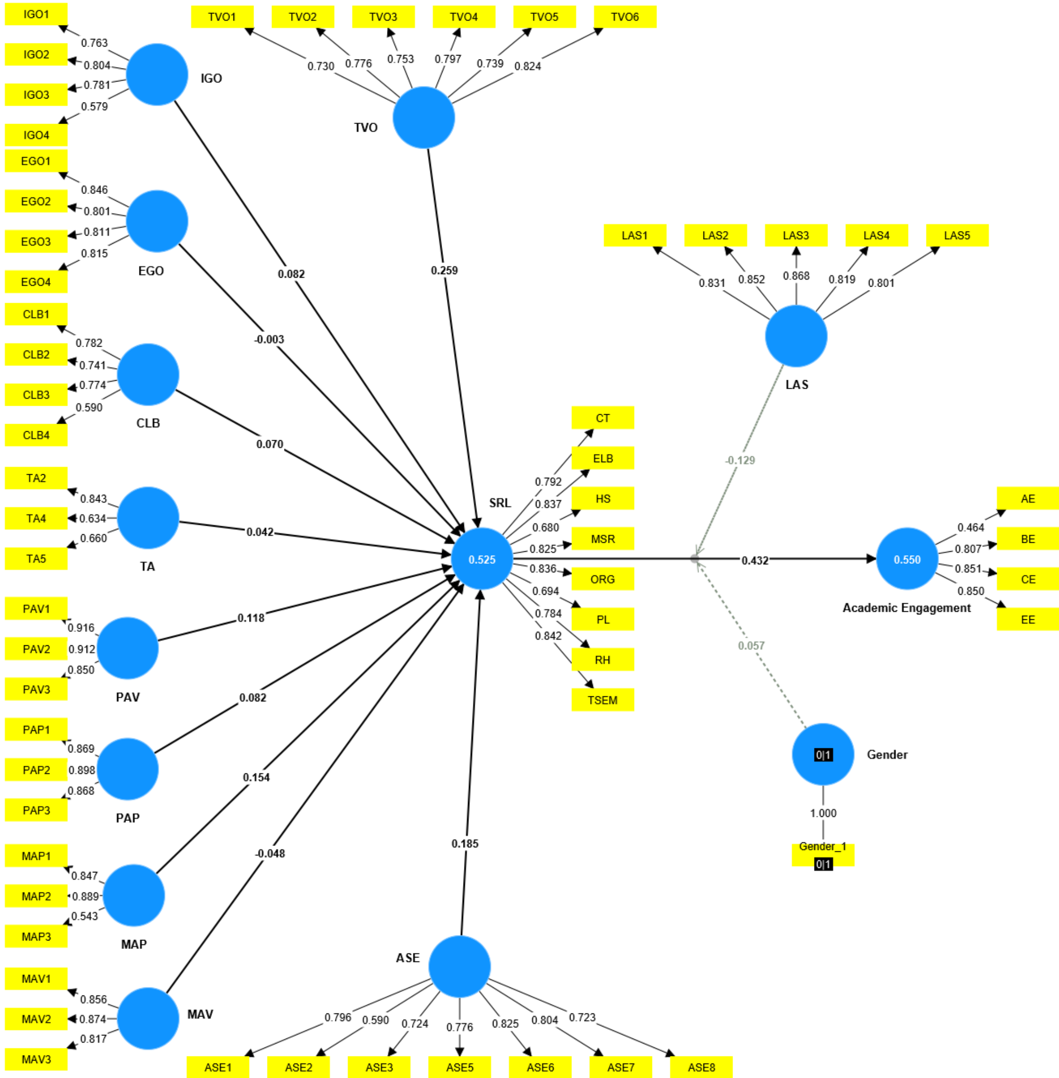


Figure 26: PLS-SEM Algorithm for the Measurement Model with Moderators
Source: Fieldwork (2023)

Discriminant Validity

Discriminant validity was evaluated using Fornell-Larcker and HTMT ratio criteria, as suggested by Kline (2023). According to the data presented in Table 67, all constructs exhibit HTMT values at 0.85 or below, in line with the criteria established by Henseler et al. (2015). Consequently, no concerns regarding discriminant validity were observed, supporting the conclusion that the measurement model is valid. Tables 66 and 67 present the results for the Fornell-Larcker and HTMT criteria.

Table 66: Fornell and Larcker Criterion

	ASE	AEG	CLB	EGO	IGO	LAS	MAP	MAV	PAP	PAV	SRL	TA	TVO
ASE	**0.752**												
AEG	0.335	**0.761**											
CLB	0.657	0.321	**0.726**										
EGO	0.569	0.234	0.506	**0.818**									
IGO	0.550	0.268	0.418	0.421	**0.737**								
LAS	0.222	0.558	0.172	0.154	0.214	**0.835**							
MAP	0.682	0.321	0.522	0.558	0.556	0.149	**0.775**						
MAV	0.334	0.120	0.319	0.372	0.280	0.072	0.383	**0.849**					
PAP	0.354	0.320	0.311	0.478	0.210	0.258	0.355	0.402	**0.878**				
PAV	0.373	0.252	0.305	0.450	0.207	0.197	0.357	0.256	0.638	**0.893**			
SRL	0.637	0.644	0.527	0.494	0.491	0.394	0.599	0.284	0.381	0.401	**0.789**		
TA	0.212	0.106	0.205	0.298	0.160	0.016	0.302	0.214	0.259	0.282	0.234	**0.719**	
TVO	0.741	0.365	0.648	0.573	0.612	0.232	0.666	0.365	0.284	0.269	0.636	0.136	**0.771**

Source: Fieldwork (2023)

Table 67: Discriminant Validity using HTMT Criterion

	ASE	AEG	CLB	EGO	IGO	LAS	MAP	MAV	PAP	PAV	SRL	TA	TVO
ASE													
AEG	0.430												
CLB	0.837	0.483											
EGO	0.664	0.282	0.654										
IGO	0.692	0.377	0.582	0.540									
LAS	0.254	0.700	0.246	0.175	0.271								
MAP	0.866	0.462	0.729	0.753	0.804	0.200							
MAV	0.389	0.213	0.409	0.444	0.358	0.094	0.545						
PAP	0.414	0.388	0.413	0.571	0.267	0.295	0.464	0.472					
PAV	0.420	0.293	0.385	0.525	0.265	0.216	0.473	0.308	0.740				
SRL	0.709	0.763	0.651	0.555	0.599	0.434	0.753	0.319	0.425	0.433			
TA	0.253	0.174	0.260	0.381	0.220	0.102	0.421	0.281	0.399	0.350	0.269		
TVO	0.848	0.470	0.816	0.661	0.773	0.265	0.856	0.425	0.326	0.296	0.703	0.197	

Source: Fieldwork (2023)

Model Fit indices for the Model with Moderators

The assessment of the measurement model aimed at a satisfactory goodness-of-fit (GoF). Table 68 shows the result of the model fit indices.

Table 68: Model Fit Indices for the Model with Moderators

Index	Acceptable Value/Condition	Actual Value (Saturated Model)	Estimated Model
SRMR	< 0.08	0.069	0.073
d_ULS	d_ULS < bootstrapped HI 95% of d_ULS and d_G < bootstrapped HI 95% of d_G	8.169	9.121
d_G		2.156	2.185
Chi-Square		5464.631	5489.409
NFI	> 0.90	0.677	0.675

Note: SRMR = Standardised root mean square residual; d_ULS = Unweighted least squares; d_G = Geodesic discrepancies; NFI = Normed fit index
Source: Fieldwork (2023)

The results from the Table 68 reveal that SRMR values ($SRMR_{SM}$ = .069 and $SRMR_{EM}$ = .073) are less than the suggested value of .08 (Hair et al., 2022). The goodness-of-fit indices were deemed satisfactory, adhering to recommended guidelines and suggesting a well-fitted model for the data (Henseler, Hubona & Ray, 2016).

Assessment of Structural Model with Moderators

The structural model was examined to assess all hypotheses. In accordance with the approach advocated by Hair, Hult, Ringle and Sarstedt (2021) and Ringle, Wende and Becker (2022), this study utilised bootstrapping with 10,000 subsamples. Also, the outcomes of the hypotheses testing for the moderating effects of gender and lecturers' academic support are presented in Tables 69 and 70.

Research Hypothesis Five

H_0: Gender does not moderate the relationship between undergraduate Economics students' self-regulated learning and academic engagement.

This research hypothesis determined the moderating role of gender in the relationship between undergraduate Economics students' self-regulated learning and academic engagement. Table 69 shows the results of the analysis on the moderating role of gender in the relationship between Economics students' self-regulated learning and academic engagement.

Table 69: Moderating Role of Gender in the Relationship between Economics Students' Self-regulated learning and Academic Engagement

Path	β	Sample mean (M)	SD	T values	P values	f^2	LLCI 5.0%	ULCI 95.0%
Gender -> AEG	0.063	0.063	0.067	0.932	0.176	0.002	-0.050	0.173
Gender x SRL -> AEG	0.057	0.062	0.122	0.469	0.320	0.002	-0.122	0.278

Note: AEG = academic engagement; SRL = self-regulated learning
Source: Fieldwork (2023)

In Table 69, gender has no significant moderating role in the relationship between undergraduate Economics students' self-regulated learning and academic engagement (β = 0.057, t = 0.469, p = .320 > 0.05). Hence, the null hypothesis that gender does not moderate the relationship between Economics students' self-regulated learning and academic engagement was sustained.

Research Hypothesis Six

H_0: Lecturer's academic support does not moderate the relationship between undergraduate Economics students' self-regulated learning and academic engagement.

This research hypothesis determined the moderating role of lecturer's academic support (LAS) in the relationship between undergraduate Economics students' self-regulated learning and academic engagement. The moderating effect of LAS was examined employing a two-stage approach (Becker et al., 2018, 2023). Table 70 shows the results of the moderating role of lecturer's academic support in relationship between Economics students' self-regulated learning and academic engagement.

Table 70: Moderating Role of Lecturer's Academic Support in the Relationship between Economics Students' Self-Regulated Learning and Academic Engagement

Path	β	Sample mean (M)	SD	T values	P values	f^2	LLCI 5.0%	ULCI 95.0%
LAS -> AEG	0.328	0.327	0.045	7.226	<.001	0.195	0.251	0.401
LAS x SRL -> AEG	-0.129	-0.127	0.047	2.752	0.003	0.055	-0.209	-0.055

Note: R^2 = 0.550 (AEG); R^2 adj. = 0.545 (AEG); R^2 = 0.525 (SRL); R^2 adj. = 0.514 (SRL); Δ = change; AEG = academic engagement; LAS = lecturer academic support; SRL = self-regulated learning
Source: Fieldwork (2023)

The results in Table 70 show that lecturers' academic support has a significant influence on students' academic engagement (β = 0.328, t = 7.226, p < .001; CI [0.251, 0.401]). Also, it can be observed that lecturers' academic support had a significant negative influence on the positive relationship between Economics students' self-regulated learning and academic engagement (β = -0.129, t = 2.752, p = .003 > 0.05; CI [-0.209, -0.055]). This result suggests that lecturers' academic support dampens the positive relationship between self-regulated learning and academic engagement. Therefore, the null hypothesis is not supported. Additionally, the magnitude of the effect (f^2 = 0.055) was large. For moderation, interaction term effect sizes of 0.005, 0.01 and 0.025 are considered small, medium, and large, respectively (Hair, Hult, Ringle, Sarstedt, Danks & Ray, 2021; Hair et al., 2022; Kenny, 2018).

Moreover, the adjusted R^2 value of 0.545 signifies that the inclusion of the interaction effect, notably lecturer academic support as a moderator in the relationship between SRL and AEG, led to an increase in the adjusted R^2 from 0.420 to 0.545 (Δ in adjusted R^2 = 0.125). Figure 27 shows the PLS-SEM bootstrapping results for the model with moderators.

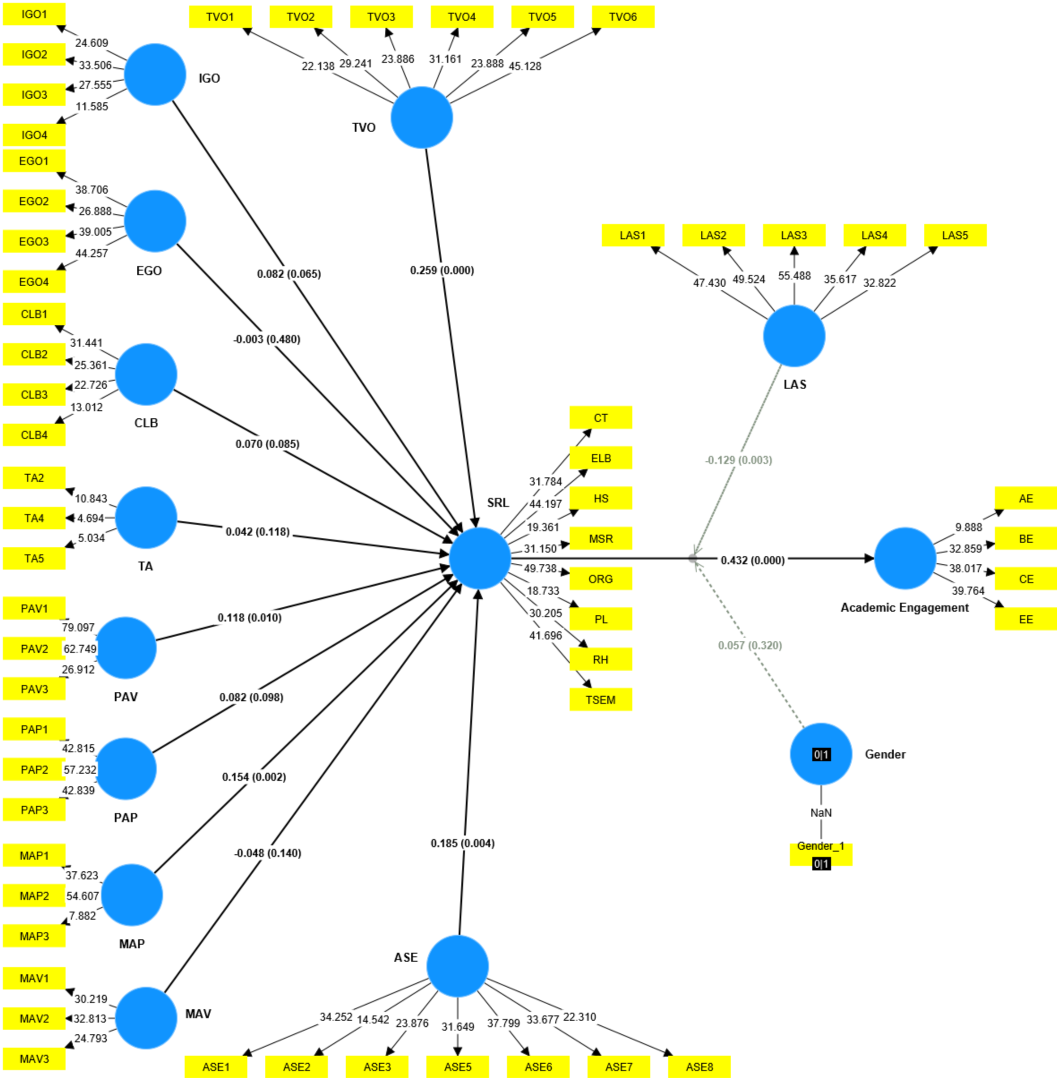


Figure 27: PLS-SEM Bootstrapping results for the model with moderators
Source: Fieldwork (2023)

Furthermore, this study included slope analysis to help understand the nature of the moderating effect of LAS. Figure 28 shows the slope analysis of the moderating effect of LAS on the relationship between SRL and AEG.

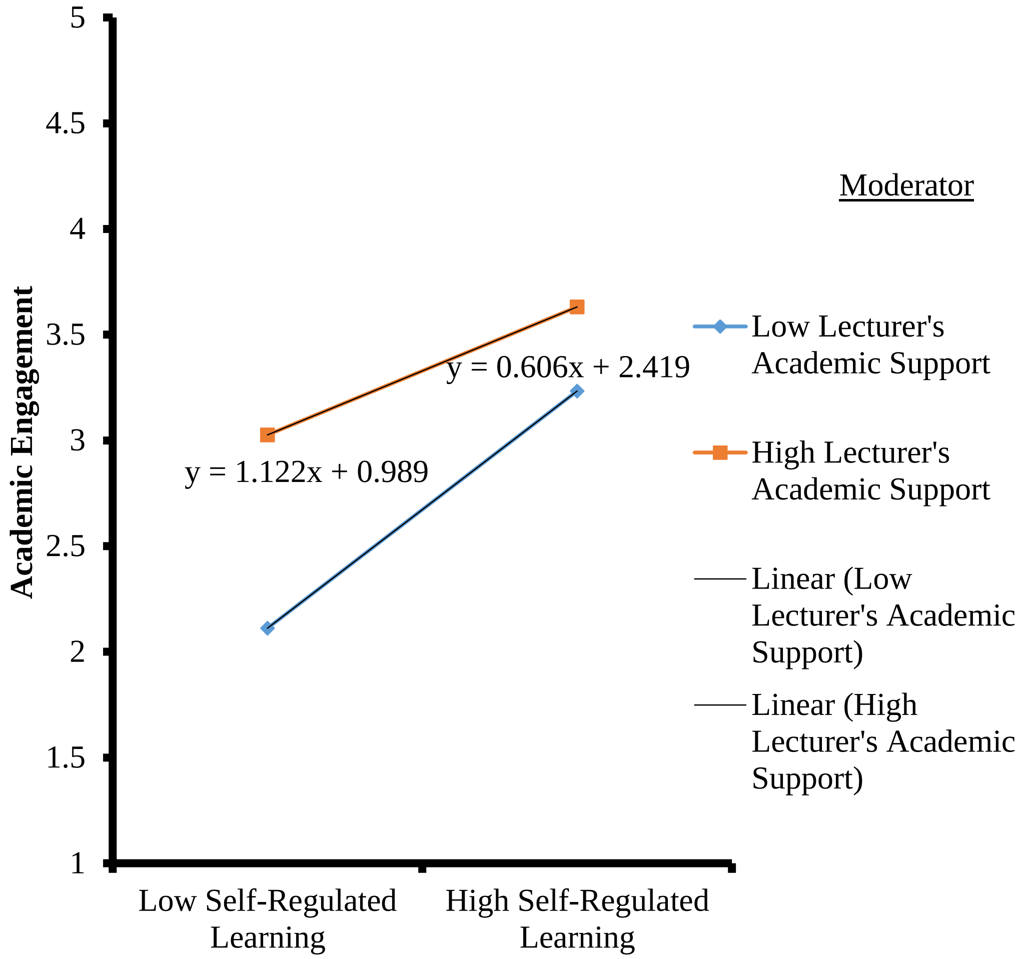


Figure 28: The Moderating Effect of LAS on the Relationship between SRL and AEG (Interaction plot of LAS x SRL on AEG)
Source: Fieldwork (2023)

As shown in Figure 28, the line is much steeper for low LAS. This demonstrates that the effect of SRL on AEG is stronger at low levels of LAS than at high levels of LAS. This result suggests that a higher LAS weakens the positive influence of SRL on AEG. In addition, the slope analysis graph generated by the SmartPLS 4 software can be found in Appendix M.

Research Hypothesis Seven

This research hypothesis determined the moderating role of students' academic level in the relationship between motivational orientations and self-regulated learning. A multi-group analysis was conducted to ascertain the distinctions between academic levels concerning the influence of MO and SRL. Table 71 shows the path coefficients of academic levels.

Table 71: Path Coefficients for the Academic Levels

Path	Level 100 β	Level 200 β	Level 300 β	Level 400 β
ASE -> SRL	0.156	0.095	0.167	0.186*
CLB -> SRL	0.041	0.180	0.020	0.196*
EGO -> SRL	0.080	-0.301	0.054	-0.075
IGO -> SRL	0.004	0.118	0.038	0.386**
MAP -> SRL	0.230**	0.025	0.135	0.188*
MAV -> SRL	-0.023	0.021	0.051	0.052
PAP -> SRL	0.086	0.266*	-0.180*	0.053
PAV -> SRL	0.292***	0.068	0.099	-0.099
TA -> SRL	-0.068	0.071	0.256***	0.149
TVO -> SRL	0.139*	0.328*	0.444***	0.164

Note: *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$
Source: Fieldwork (2023)

Table 71 shows the path coefficients for the relationship between MO and SRL for students' academic levels (see Appendix S for detailed bootstrapping results). A summary of the outcomes of the multi-group analysis is presented in Table 72.

Table 72: Multi-Group Analysis for the Moderating Role of LES in the relationship between MO and SRL

Path	Difference (Level 100 - Level 200)	Difference (Level 100 - Level 300)	Difference (Level 100 - Level 400)	Difference (Level 200 - Level 300)	Difference (Level 200 - Level 400)	Difference (Level 300 - Level 400)
ASE -> SRL	0.061	-0.011	-0.030	-0.072	-0.091	-0.019
CLB -> SRL	-0.139	0.021	-0.155	0.160	-0.016	-0.176
EGO -> SRL	0.381	0.027	0.156	-0.354	-0.225	0.129
IGO -> SRL	-0.115	-0.034	-0.382	0.081	-0.268	-0.349
MAP -> SRL	0.205	0.095	0.042	-0.110	-0.163	-0.053
MAV -> SRL	-0.044	-0.074	-0.075	-0.030	-0.031	-0.001
PAP -> SRL	-0.180	0.266	0.033	0.446	0.213	-0.233
PAV -> SRL	0.225	0.194	0.391	-0.031	0.166	0.197
TA -> SRL	-0.139	-0.324	-0.217	-0.186	-0.078	0.107
TVO -> SRL	-0.190	-0.305	-0.025	-0.115	0.164	0.280

Note: The differences are not significant for the relationship between MO and SRL for the various academic levels ($p > .05$)
Source: Fieldwork (2023)

From Table 72, the results indicate that all disparities observed were not statistically significant ($p > .05$). These results suggest that the academic level of Economics students does not moderate the relationship between MO and SRL. Thus, the null hypothesis was supported.

Research Hypothesis Eight

The last research hypothesis determined the mediating role of undergraduate Eocnomics students' self-regulated learning in the relationship between motivational orientations and academic engagement. Table 73 reveals the analysis conducted to ascertain the mediating role of students' self-regulated learning in the relationship between motivational orientations and academic engagement. In addition, the results of the total effects analysis are presented (see Appendix T).

Table 73: Mediation Analysis for the Mediating Role of SRL in the Relationship between MO and AEG

Specific Indirect Path	Original sample (β)	Sample mean (M)	SD	T value	*p* values	LLCI 5.00%	ULCI 95.00%
EGO -> SRL -> AEG	-0.002	-0.002	0.034	0.054	0.479	-0.061	0.051
IGO -> SRL -> AEG	0.053	0.056	0.035	1.506	0.066	-0.009	0.107
TA -> SRL -> AEG	0.027	0.029	0.023	1.193	0.116	-0.014	0.062
ASE -> SRL -> AEG	0.120	0.121	0.046	2.603	0.005	0.042	0.194
MAP -> SRL -> AEG	0.100	0.098	0.037	2.700	0.003	0.044	0.166
TVO -> SRL -> AEG	0.168	0.166	0.040	4.163	<.001	0.108	0.243
PAV -> SRL -> AEG	0.077	0.078	0.034	2.228	0.013	0.024	0.137
PAP -> SRL -> AEG	0.053	0.054	0.042	1.270	0.102	-0.015	0.123
CLB -> SRL -> AEG	0.046	0.046	0.033	1.362	0.087	-0.007	0.103
MAV -> SRL -> AEG	-0.031	-0.028	0.029	1.088	0.138	-0.081	0.013

Note: “ASE = Academic Self-Efficacy; CLB = Control of Learning Beliefs; EGO = Extrinsic Goal Orientation; IGO = Intrinsic Orientation; MAP = Mastery Approach Goal Orientation; MAV = Mastery Avoidance Goal Orientation; MSR = Metacognitive Self-Regulation; ORG = Organisation; PAP = Performance Approach Goal Orientation; PAV = Performance Avoidance Goal Orientation; TVO = Task Value Orientation”

The mediation analysis examined the indirect effects of EGO, IGO, TA, ASE, MAP, TVO, PAV, PAP, CLB and MAV on AEG via SRL. For the EGO → SRL → AEG pathway, the indirect effect was not significant ($\beta = -0.002$, $t = 0.054$, $p = 0.479$). This suggests that SRL does not mediate the relationship between EGO and AEG, indicating that extrinsic goal orientation does not significantly influence academic engagement through self-regulated learning.

Similarly, for IGO → SRL → AEG, the indirect effect was positive but not statistically significant ($\beta = 0.053$, $t = 1.506$, $p = 0.066$). This implies that intrinsic goal orientation does not significantly influence AEG through SRL, which is consistent with previous findings that intrinsic motivation may influence engagement directly rather than through self-regulatory processes. For TA → SRL → AEG, the mediation effect was not significant ($\beta = 0.027$, $t = 1.193$, $p = 0.116$). This suggests that TA does not exert an indirect effect on AEG through SRL, implying that test anxiety may influence academic engagement through other mechanisms beyond self-regulation.

Conversely, for ASE → SRL → AEG, the indirect effect was significant ($\beta = 0.120$, $t = 2.603$, $p = 0.005$). This indicates complementary partial mediation, as both the direct and indirect effects are in the same direction (Zhao et al., 2010). This finding supports the notion that students with higher ASE tend to regulate their learning more effectively, thereby increasing their academic engagement. For MAP → SRL → AEG, the mediation effect was also significant ($\beta = 0.100$, $t = 2.700$, $p = 0.003$). This result suggests a complementary partial mediation, highlighting that students with a mastery goal orientation develop stronger self-regulatory strategies.

A stronger mediation effect was observed for TVO → SRL → AEG, with a significant indirect effect ($\beta = 0.168$, $t = 4.163$, $p < 0.001$). This supports a complementary partial mediation, suggesting that students who perceive high task value engage in self-regulated learning, which in turn increases academic engagement. For PAV → SRL → AEG, the indirect effect was significant ($\beta = 0.077$, $t = 2.228$, $p = 0.013$). This result supports a complementary partial mediation, suggesting that performance-avoidance goal-oriented students engage in SRL, which contributes positively to academic engagement, albeit to a lesser extent than other constructs such as ASE and TVO.

However, for PAP → SRL → AEG, the mediation effect was not significant ($\beta = 0.053$, $t = 1.270$, $p = 0.102$). This suggests that performance goal orientation does not significantly influence academic engagement through SRL, possibly due to the mixed effects of competitive learning behaviours on engagement. Similarly, for CLB → SRL → AEG, the indirect effect was not significant ($\beta = 0.046$, $t = 1.362$, $p = 0.087$). Finally, for MAV → SRL → AEG, the indirect effect was negative but not significant ($\beta = -0.031$, $t = 1.088$, $p = 0.138$).

Discussion

This section of the chapter discusses the results that have emerged concerning the research objectives in light of relevant empirical studies.

Economics Students' Level of Motivational Orientations

This research question examined undergraduate Economics students' level of motivational orientations. The findings of the study showed that Economics students' exhibited high levels of intrinsic goal orientation, extrinsic goal orientation, task value orientation, control of learning beliefs, academic self-efficacy, mastery approach goal orientation, mastery avoidance goal orientation, performance approach goal orientation and performance avoidance goal orientation. However, students' exhibited moderate level of test anxiety. The discussion proceeds to elaborate on the findings pertaining to these motivational orientations as follows:

Intrinsic and Extrinsic Goal Orientations

The heightened levels of both intrinsic and extrinsic goal orientations among Economics students illuminate a multifaceted motivational landscape within the discipline. The prevalence of intrinsic goal orientation suggests a genuine passion for the subject matter, with students deriving personal satisfaction and interest from engaging in economic studies. Simultaneously, the elevated levels of extrinsic goal orientation indicate a recognition of external rewards and recognitions associated with academic achievement in Economics. This dual motivation framework underscores the complex interplay of internal and external factors that drive students' commitment to their academic pursuits in Economics, providing valuable insights into the nuanced nature of motivational orientations within this field. This finding is consistent with that of Anane (2020) who found that student teachers had high levels of intrinsic and extrinsic motivation.

Task Value Orientation, Control of Learning Beliefs, and Academic Self-Efficacy

The high level of task value orientation, control of learning beliefs, and academic self-efficacy among Economics students reflect a robust foundation for effective learning and academic success. Task value orientation signifies the perceived importance and relevance of economic studies, indicating that students recognise the practical value of their coursework (Anane, 2020). Additionally, the strong sense of control over their learning processes and the elevated levels of academic self-efficacy demonstrate students' confidence in their ability to master the challenging concepts and tasks inherent in Economics education. These findings collectively highlight a positive motivational environment, suggesting that students in this discipline perceive their academic efforts as purposeful, controllable, and within their capacity to excel.

Mastery and Performance Goal Orientations

The simultaneous expression of high mastery and performance goal orientations levels among Economics students reveals a balanced motivational profile. Mastery approach goal orientation indicates a desire to develop competence and mastery of the subject matter, emphasising the acquisition of knowledge and skills for personal growth. On the other hand, performance goal orientations, both approach and avoidance, suggest a concern for external evaluation and achievement outcomes. The coexistence of these motivational orientations implies that Economics students are driven by both the intrinsic satisfaction of mastering the subject and the desire to achieve favourable outcomes in assessments. This duality underscores the importance of fostering a learning environment that accommodates both mastery and performance-oriented goals to cater to the diverse motivational needs of Economics students.

Test Anxiety

While students in Economics exhibited high levels of positive motivational orientations, the moderate level of test anxiety introduces a nuanced dimension to their academic experience. The presence of test anxiety suggests a potential psychological barrier that, despite the overall positive motivational climate, may hinder optimal performance in evaluative situations. Understanding and addressing the factors contributing to test anxiety is crucial for creating interventions that promote a more supportive and conducive testing environment for Economics students, ensuring their performance aligns with their intrinsic motivation and positive goal orientations. This observation underscores the importance of adopting a holistic approach to student well-being that considers their positive motivational attributes and potential challenges, such as test anxiety. This finding is contrary to that of Anane (2020), who found that student teachers had low levels of test anxiety.

Economics Students' Level of Self-Regulated Learning

The second research question explored undergraduate Economics students' level of self-regulated learning. The study revealed that Economics students exhibited a high level of self-regulated learning. The finding that higher education Economics students exhibited a high level of self-regulated learning suggests a positive and proactive approach to their academic endeavours. This high level of self-regulated learning indicates that students in Economics are actively employing strategies such as goal setting, time management, and metacognition to control and direct their learning processes. This finding aligns with the idea that self-regulated learning is crucial to academic success, emphasising students' ability to take charge of their own learning experiences. The observed high level of self-regulated learning among higher education Economics students may indicate a motivated and goal-oriented student body, showcasing their commitment to mastering the complexities of the discipline.

Contrary to the findings of Appiah-Kubi et al. (2022), who reported moderate levels of self-regulated learning among Senior High School (SHS) students, the current study reveals a divergent pattern. This incongruity prompts a critical examination of the potential factors contributing to the differences in the observed self-regulated learning levels. Possible explanations may include variations in the definitions and measurement scales of self-regulated learning, differences in the characteristics of the sampled SHS student populations, or distinctions in educational contexts and practices.

Furthermore, the study by Mahama et al. (2022), focusing specifically on college of education students, revealed a low level of self-regulated learning, a finding inconsistent with the outcomes of the present study. The discrepancy between these studies raises intriguing questions regarding factors that may contribute to divergent self-regulated learning levels within the context of higher education. Key considerations may include unique academic demands, instructional approaches, and programme structures within college of education settings that could impact self-regulated learning behaviours. In the broader academic discourse, this departure in findings highlights the complexity of understanding and measuring self-regulated learning across different educational levels. This prompts an exploration of the specific nuances within high school and higher education environments that may influence the development and manifestation of self-regulated learning skills.

Economics Students' Level of Academic Engagement

Research question three examined undergraduate Economics students' level of academic engagement. The study found that Economics students had a high level of academic engagement. Firstly, a high level of academic engagement among Economics students suggests a strong connection and investment in their academic pursuits. This may indicate that students in Economics are motivated and actively participating in their learning experiences, demonstrating a genuine interest in the subject matter. The high level of academic engagement aligns with research suggesting that students are more likely to achieve better academic outcomes and develop a deeper understanding of the material when they are engaged in their studies.

The findings of the current study present a noteworthy departure from the conclusions drawn in several prior investigations, including those conducted by Appiah-Kubi et al. (2022), Bayoumy and Alsayed (2021), Mahama et al. (2022). This discrepancy in the results prompts a thorough exploration of the contextual and methodological disparities that may account for these variations. Appiah-Kubi et al. (2022), and Bayoumy and Alsayed (2021) reported a moderate level of academic engagement among students, a finding divergent from the current study. It is crucial to note the differences in the sampled populations and the educational levels assessed in these studies. Appiah-Kubi et al. investigated 315 SHS students, whereas Bayoumy and Alsayed concentrated on university students. The shift from high school to university often involves a transition in academic expectations, instructional methodologies, and overall educational environments, potentially influencing observed levels of academic engagement.

Moreover, the nuanced differences in academic engagement levels reported by Appiah-Kubi et al. (2022) and Bayoumy and Alsayed (2021) could be attributed to these distinct educational stages' unique characteristics and demands. A comprehensive examination of the factors contributing to academic engagement requires consideration of how they manifest and evolve across diverse academic settings. Additionally, the study conducted by Mahama et al. (2022) contrasts the findings of the current research by asserting that college education students exhibited a low level of academic engagement. This raises questions regarding the potential impact of a specific educational context on academic engagement levels. Differences in programme structures, curricular emphases, and teaching approaches within college of education settings may contribute to these disparate outcomes.

From an institutional perspective, the finding highlights the potential effectiveness of the educational programmes and teaching methods within the Economics curriculum. It implies that the content and delivery of the courses may resonate well with the interests and goals of the students, fostering a positive and engaging learning environment. Additionally, it suggests that the educational institutions providing higher education in Economics may have implemented strategies or initiatives that promote student involvement, participation, and enthusiasm for their studies. Recognising the high level of academic engagement can guide educators and institutions in identifying successful practices and areas for potential improvement within the Economics education curriculum.

Moreover, the observation of a high level of academic engagement among higher education economics students underscores the importance of maintaining and further enhancing the factors contributing to this positive learning environment. Institutions may consider continuous evaluation and refinement of their teaching methodologies, incorporating interactive and participatory approaches that stimulate students' interest and involvement. Moreover, educators can leverage the students' enthusiasm by incorporating real-world examples, case studies, and practical applications in the curriculum. The finding invites a deeper exploration into the specific aspects of the Economics education experience that contribute to this high level of engagement, fostering a more comprehensive understanding of effective teaching and learning practices within the discipline.

Specifically, Economics students had high level of behavioural, cognitive and emotional engagement. When Economics students exhibit high level of emotional engagement in a learning endeavour, it signifies a significant allocation of their affective resources towards the assigned tasks. This suggests a deep involvement and investment in the subject matter, wherein students manifest a heightened level of emotional connection and commitment to the learning process (Weng & Chiu, 2022). Such emotional engagement reflects a dynamic interaction between the individual's affective responses and the learning context, potentially influencing their overall learning outcomes and academic performance. In addition, an elevated degree of cognitive engagement among Economics students implies a propensity for reflective consideration regarding their commitment to exert efforts in comprehending learning materials and honing skills (Li et al., 2021; Weng & Chiu, 2022). This phenomenon underscores a scholarly dedication wherein students actively contemplate and deliberate upon their readiness to invest intellectual resources towards grasping the subject matter and refining their competencies within Economics. This heightened level of engagement underscores a profound commitment to academic pursuits, reflecting a conscientious approach towards academic endeavours characterised by a diligent pursuit of comprehension and skill acquisition.

The finding concerning high cognitive engagement of higher education Economics students validates that of Yidana and Arthur (2022), who discovered that SHS Economics students exhibited high level of cognitive engagement. It is important to note that the recent finding pertains to higher education Economics students, while Yidana and Arthur's study focused on SHS Economics students. The transition from high school to higher education often involves changes in curriculum, teaching methods, and student expectations, which can impact cognitive engagement. Hence, caution should be exercised when comparing the findings of the two studies.

Additionally, other studies (e.g., Cornell et al., 2016; Delfino, 2019) have demonstrated that students exhibit high cognitive engagement. Nevertheless, Ayub et al. (2017) discovered that the degree of students' involvement in Mathematics was of a moderate magnitude. In contrast to the current study's findings, several studies (Estévez et al., 2021; Mahama et al., 2022; Shukor et al., 2014) have demonstrated that students typically exhibit low levels of cognitive engagement.

Conversely, higher education Economics students exhibited a moderate level of agentic engagement. This finding suggests that within the context of higher education, Economics students demonstrate a discernible level of agentic engagement, albeit at a moderate intensity. Agentic engagement, pertains to the proactive endeavours undertaken by individuals to actively contribute to their learning and the teaching process (Reeve, 2013; Reeve & Tseng, 2011). The moderate level of agentic engagement observed among Economics students indicates a degree of proactive involvement in their academic pursuits, where they are inclined to communicate their requirements for effective learning experiences. This manifestation underscores a constructive relationship between students and educators, wherein students actively shape their learning environment by articulating their educational needs. The moderation in agentic engagement might be influenced by various factors, including the complexity of the subject matter, individual learning preferences, and the academic culture within the Economics programme. This finding underscores the importance of recognising and supporting students' autonomy and agency within the learning environment while also prompting educators and institutions to explore strategies that may further enhance students' self-directed learning skills in Economics education.

Difference in Economics Students' Self-Regulated Learning based on Gender and Academic Level

The initial research hypothesis entailed the investigation of disparities in self-regulated learning among undergraduate Economics students based gender and academic level. The study revealed no significant differences in students' self-regulated learning based on gender and academic level. This is a unique finding because no study has revealed the interaction effect of gender and academic level on Economics students' self-regulated learning. This finding implies that students' self-regulated learning is not influenced by either gender or academic level. Also, this outcome signifies a crucial contribution to the existing body of knowledge, challenging preconceived notions that posited potential variations in self-regulated learning based on these demographic factors. The absence of discernible distinctions underscores the universality of self-regulated learning processes among students within the context of this study, irrespective of gender or academic progression.

In addition, the revelation that gender does not play a significant role in shaping self-regulated learning patterns prompts a reconsideration of previously assumed gender-related disparities in educational settings. This outcome aligns with contemporary discussions in educational psychology emphasising the importance of individual differences over gender-based generalisations. Furthermore, the study's findings contradict the assertion that academic level serves as a defining factor in students' self-regulated learning behaviours. This refutation challenges existing theoretical frameworks, compelling scholars to reevaluate the presumed influence of academic progression on the development and execution of self-regulated learning strategies.

The findings of this study are at odd with those reported by Appiah-Kubi et al. (2020), who found that male students exhibited higher levels of self-regulated learning than their female counterparts. The findings of Appiah-Kubi et al. contrast with those of the present study, which showed no significant differences in self-regulated learning between male and female students. This divergence suggests that variations in educational contexts, populations, and methodologies may contribute to differences in the observed gender-based patterns of self-regulated learning.

The current study's finding lends credence to that of several studies (e.g., Anazifa et al., 2023; Noviani et al., 2023; Stanikzai, 2019; Temi, 2005). For instance, Anazifa et al., Noviani et al. and Stanikzai found no significant differences in the utilisation of self-regulated learning strategies between male and female students. The alignment of the present study's findings with those of Anazifa et al., Noviani et al. and Stanikzai adds credence to the argument that gender differences in self-regulated learning may not be universally applicable but rather dependent on specific contextual factors.

Difference in Economics Students' Academic Engagement based on Gender and Academic Level

This hypothesis examined disparities in academic engagement among undergraduate Economics students based on gender and academic level. The study showed no significant variation in cognitive, behavioural and emotional engagement based on gender. This suggests that economics students' cognitive, behavioural, and emotional engagement were not affected by their gender. This finding confirms that of Appiah-Kubi et al. (2022) and King (2016), who found no substantial variation in academic engagement based on gender. Although the findings of the current study, Appiah-Kubi et al., and King are similar, it is worth noting that their studies focused on SHS students.

Also, the study revealed that, at the univariate level, although agentic engagement was moderate, males exhibited higher agentic engagement compared to females. The finding suggests that, when examined individually (at the univariate level), there is a noticeable difference in agentic engagement between male and female Economics students. Specifically, despite both genders demonstrating a moderate level of agentic engagement, males displayed a higher degree of this type of engagement compared to their female counterparts. This observation implies potential gender-related distinctions in the way Economics students approach and participate in agentic aspects of their academic pursuits. The term "agentic engagement" often involves self-driven, proactive, and goal-oriented behaviours, indicating that male students, on average, may exhibit a greater degree of initiative, self-motivation, or proactive involvement in their academic activities within the context of the Economics discipline. This finding is not in harmony with that of Ganiyu (2021) who found that male students had high level of behavioural engagement as compared to females.

Furthermore, significant differences were identified in both behavioural and agentic engagement based on students' academic level. Specifically, students at the 200 academic level demonstrated higher levels of behavioural engagement compared to their counterparts at levels 100, 300, and 400 within the Economics programme. This finding suggests that Economics students' behavioural engagement is sensitive to their academic level. This finding lends credence to the assertion of Canchola González and Glasserman-Morales (2020) that academic engagement among students may be influenced by certain profile characteristics such as academic level.

Moreover, it was unexpected to observe that students in level 100 exhibited higher agentic engagement than those enrolled in levels 200, 300, and 400. This unexpected finding suggests that, contrary to expectations, students at the 100 academic level display higher levels of agentic engagement than their counterparts in higher academic levels (200, 300, and 400). One plausible explanation for this finding may involve the novelty of the academic environment for level 100 students. As students transition into higher academic levels, the initial exposure to new and challenging concepts may foster a heightened sense of autonomy and proactivity in their learning approach.

Additionally, it is conceivable that students at the 100 academic level perceive their coursework as foundational, sparking a greater intrinsic motivation to take initiative and be self-directed in their studies. The absence of more advanced or specialised content at this stage could potentially lead to a stronger focus on agentic engagement as students establish their academic footing. Furthermore, individual differences and the diverse academic backgrounds of students entering the programme might contribute to variations in agentic engagement across different levels. This observation underscores the need for a nuanced understanding of factors influencing agentic engagement, challenging assumptions about its linear progression with academic advancement.

However, gender and academic level had no interaction effect on students' academic engagement. This is a novel finding since no study has determined the interaction effect of gender and academic level on Economics students' academic engagement. The absence of an interaction effect implies that any differences in academic engagement between genders or across academic levels are not dependent on or influenced by the combination of both factors. For example, it suggests that the effect of gender on academic engagement is consistent regardless of whether students are at lower or higher academic levels within the Economics discipline. Similarly, the academic level's impact on engagement is not modified by gender.

Influence of Economics Students' Motivational Orientations on their Self-Regulated Learning

This hypothesis examined the influence of undergraduate Economics students' motivational orientations on their self-regulated learning. The findings of the study indicated that academic self-efficacy, mastery approach goal orientation, performance avoidance goal orientation and task value orientation had significant positive influence on Economics students' self-regulated learning. The findings align with the self-regulated learning theory, which posits that motivational beliefs precede self-regulation in learning (Schunk & Zimmerman, 2008; Zimmerman, 2002). Additionally, Wolters (2010) noted that students' persistence in academic tasks is primarily facilitated by their motivational orientations. These findings imply that fostering students' self-regulation in Economics learning may be more effective with a prior focus on enhancing their motivational orientations, including academic self-efficacy, mastery approach goal orientation, performance avoidance goal orientation, and task value orientation. Conversely, control of learning beliefs, test anxiety, mastery avoidance, performance approach, intrinsic and extrinsic goal orientations had no significant effect on self-regulated learning.

Specifically, task value was the dominant motivational orientation that influenced self-regulated learning. The study indicated that task value orientation had a significant positive effect on Economics students' self-regulated learning. Task value orientation refers to students' perceptions of the importance and utility of a task. In the context of economics students, a positive effect suggests that when they perceive value and relevance in the tasks related to their academic pursuits, they are more likely to engage in self-regulated learning behaviours. This finding is alignment with the expectancy-value theory which posits that individuals are motivated to engage in activities where they perceive value and expect successful outcomes (Ryan & Deci, 2020; Wigfield et al., 2015; Yidana & Arthur, 2024). In the educational realm, this finding underscores the importance of cultivating a sense of purpose and significance in academic tasks to enhance students' motivation for self-regulated learning. In addition, finding of the current study validates the studies of prior researchers who found that task value had a significant positive influence on self-regulated learning (Bai & Wang, 2020; Lim & Yeo, 2021) revealed that intrinsic value has a significant influence on self-regulated learning.

The positive influence of task value orientation on self-regulated learning implies that educational strategies should emphasise the real-world applicability and relevance of economic concepts and tasks. Connecting theoretical concepts to practical implications and demonstrating the tangible value of mastering these skills can enhance students' intrinsic motivation to engage in self-regulated learning. This finding also suggests that educators can play a pivotal role in highlighting the practical implications of economics, showcasing its relevance to students' future careers and personal lives. By emphasising the intrinsic value of learning, educators can inspire students to take a more proactive and self-directed approach to their academic endeavors, fostering a deeper and more meaningful engagement with the subject matter.

Furthermore, educational institutions can explore the integration of experiential learning opportunities, case studies, and real-world applications into the economics curriculum. These approaches not only enhance the perceived value of the subject matter but also provide students with opportunities to apply their knowledge in practical scenarios. This alignment of task value with self-regulated learning not only contributes to academic success but also prepares economics students for the challenges and demands of their future professional endeavours. In essence, recognising and leveraging the positive effect of task value orientation on self-regulated learning offers a multifaceted approach to enriching the educational experience of economics students.

In addition, the study revealed that academic self-efficacy emerged as the second dominant predictor of Economics students' self-regulated learning (SRL). Academic self-efficacy had a significant positive influence on students' self-regulated learning (SRL). This suggests that students who have cultivated self-efficacy in Economics learning demonstrate a greater tendency to regulate their effort in the course. Furthermore, this discovery underscores the necessity for educators in higher education to prioritise the implementation of strategies aimed at enhancing students' self-efficacy concerning Economics learning, as a means to foster self-regulated learning behaviours in this domain. Additionally, this finding suggests that students who possess a strong belief in their capabilities to succeed academically in economics are more likely to engage in effective self-regulated learning strategies.

This finding aligns with social cognitive theory, emphasising the role of self-beliefs in shaping behaviour (Bandura, 1994). As students with higher academic self-efficacy are likely to approach tasks with confidence and perseverance, they may be more motivated to set challenging goals, regulate their efforts, and persist in the face of difficulties. This positive influence on self-regulated learning is crucial for fostering a more adaptive and effective learning process among economics students. This finding is consistent with that of Zhang et al. (2023), who revealed that self-efficacy had a positive effect on SRL ability. In addition, the finding of this study confirms those of other empirical studies (e.g., Bai & Wang, 2020; Chen et al., 2019; Demiroren et al., 2016; Hwang & Oh, 2021), which revealed a positive connection between self-efficacy and SRL skills.

In terms of practical implications, educational institutions and instructors can consider implementing interventions that target the enhancement of students' academic self-efficacy beliefs. Strategies such as providing constructive feedback, offering mentorship, and designing learning environments that promote a sense of competence can contribute to the development and maintenance of students' confidence in their ability to succeed in economics. Additionally, educators may incorporate instructional methods that explicitly teach self-regulated learning skills, encouraging students to become more autonomous and strategic learners. By recognizing the interplay between academic self-efficacy and self-regulated learning, educational practices can be tailored to empower economics students and promote their academic success.

Furthermore, the current study showed that mastery approach goal orientation and performance-avoidance goal orientation positively influenced Economics students’ self-regulated learning. This finding aligns with Abdulhay et al. (2020), indicating a significant positive association between personal mastery, performance goals, mastery goal structure, and self-regulation in writing. Their study highlighted that goal orientation played a substantial and positive role in predicting self-regulation within the context of writing.

Moreover, the findings of the study showed that control of learning beliefs, test anxiety, mastery avoidance, performance approach, intrinsic and extrinsic goal orientations had no significant effect on self-regulated learning. This suggests that while these variables are often considered important in educational psychology and learning theory, they may not directly impact the extent to which individuals are able to engage in self-regulated learning behaviours. It is possible that other factors not examined in this study or individual differences among participants could contribute more substantially to the development and application of self-regulation strategies in learning contexts.

Influence of Economics Students' Self-Regulated Learning on their Academic Engagement

This research objective determined the influence of undergraduate Economics students' self-regulated learning on their academic engagement. The study indicated that Economics students' self-regulated learning had a significant positive influence on their academic engagement. The finding that economics students' self-regulated learning significantly and positively influences their academic engagement has profound implications for both educational theory and practical strategies. Academic engagement is a multifaceted concept that encompasses a student's investment, effort, and involvement in academic activities. The positive influence of self-regulated learning (SRL) on academic engagement suggests that when students employ effective self-regulation strategies, such as goal setting, time management, and metacognitive skills, they are more likely to be actively involved and invested in their academic pursuits. This aligns with the theoretical framework of self-determination theory, which posits that individuals are more likely to engage in activities when they experience a sense of autonomy, competence, and relatedness (Chiu, 2024).

Also, this finding affirms existing literature on self-regulated learning, emphasising that active involvement in SRL strategies motivates students to actively participate in school and fosters positive attitudes toward academic success (Wu et al., 2023). The current study confirms the findings of previous studies that self-regulation positively correlates with learning engagement, indicating that students exhibiting elevated levels of self-regulation tend to display heightened levels of engagement (Anthonysamy et al., 2020; Utami & Aslamawati, 2021; Zaha, 2022). Likewise, other empirical studies (e.g., Dewi & Hadiana, 2021; Setiani & Wijaya, 2020) revealed that self-regulated learning had significant positive influence on academic engagement.

In addition, this finding is consistent with both self-regulated learning (SRL) theory and engagement theory. According to SRL theory (Zimmerman & Schunk, 2001), students who actively regulate their learning through goal setting, strategic planning and self-monitoring are more likely to exhibit higher levels of engagement as they take ownership of their learning process. This theoretical perspective emphasises the role of metacognition, motivation and behavioural regulation in promoting sustained academic engagement. Similarly, engagement theory (Kearsley & Shneiderman, 1999) posits that meaningful learning occurs when students are actively and intrinsically involved in academic tasks, often facilitated by self-directed learning behaviours. The results of this study support these theoretical claims by demonstrating that self-regulated learners are more engaged, suggesting that promoting SRL strategies can improve students' academic participation and overall learning outcomes.

The observed positive influence emphasises the importance of fostering self-regulated learning skills within the Economics education curriculum. Educational institutions can design interventions and instructional approaches that explicitly teach and encourage self-regulated learning strategies. This includes providing guidance on goal setting, time management, and effective study habits. By nurturing these skills, educators can empower economics students to take a more proactive and autonomous approach to their learning, resulting in increased academic engagement. Additionally, recognising and rewarding instances of self-regulated learning can further motivate students to develop and apply these skills consistently.

Moreover, educators can integrate interactive and collaborative learning experiences into the economics curriculum to facilitate the development of self-regulated learning skills. Group projects, discussions, and real-world applications can provide opportunities for students to practice and refine their self-regulation abilities. Moreover, creating a supportive learning environment that acknowledges the importance of self-regulated learning and provides resources for skill development can contribute to enhanced academic engagement among economics students. Ultimately, understanding and leveraging the positive influence of self-regulated learning on academic engagement offers a pathway to fostering a more dynamic and enriching learning experience for students in the field of economics.

Moderating Role of Gender in the Positive Relationship between Economics Students' Self-Regulated Learning and Academic Engagement

This research hypothesis ascertained the moderating role of gender in the positive relationship between undergraduate Economics students' self-regulated learning and academic engagement. The findings of the study revealed that gender had no significant moderating role in the positive relationship between Economics students' self-regulated learning and academic engagement. This suggests that the beneficial impact of self-regulated learning on academic engagement is consistent regardless of whether the student is male or female. From a theoretical perspective, this finding aligns with the idea that the cognitive and motivational processes associated with self-regulated learning are universal and not significantly influenced by gender differences. It challenges stereotypical assumptions about gender-related variations in academic behaviours (Appiah-Kubi et al., 2022; Heirweg et al., 2019; Li et al., 2019) and emphasises the commonality in how self-regulated learning contributes to academic engagement among male and female economics students.

This finding is not in agreement with other studies (e.g., Appiah-Kubi et al., 2022; Heirweg et al., 2019; Li et al., 2019), which revealed gender variations in self-regulated learning and academic engagement. Several factors may have contributed to the findings of the current study. It is possible that both male and female students, on average, employ similar self-regulated learning strategies, which is contrary to the observation of Heirweg et al.

(2019) that females tend to have higher SRL profiles than males. If there are no significant gender differences in the types and effectiveness of self-regulated learning behaviours, the relationship between self-regulated learning and academic engagement may not vary between genders. Also, the motivational factors driving self-regulated learning and academic engagement might be consistent across genders. If both male and female students are similarly motivated by factors such as achievement, interest in the subject matter, or personal goals, the impact of self-regulated learning on academic engagement may not be influenced by gender differences.

Furthermore, the educational environment or cultural context may play a role in minimising gender-based variations in the relationship between self-regulated learning and academic engagement. If the academic setting promotes equitable opportunities, resources, and expectations for both genders, the impact of self-regulated learning on academic engagement may remain consistent.

Another possible explanation for this finding could be the evolving educational landscape that has been progressively moving towards fostering an inclusive and equitable learning environment. Educational institutions may be implementing teaching methods and support structures that encourage self-regulated learning behaviours uniformly across genders. If gender-specific barriers or biases have been reduced within the academic setting, the impact of self-regulated learning on academic engagement may be comparable for male and female students.

Additionally, it is crucial to consider the individual variability within genders. While there may be statistically non-significant differences between genders at a group level, there may still be substantial variation within each gender group. The study's results, therefore, suggest that, on average, any gender-related variations in self-regulated learning do not significantly alter the positive relationship with academic engagement. This finding reinforces the idea that, in contemporary educational environments, the link between self-regulated learning and academic engagement is a shared experience among students, irrespective of their gender identities.

Moderating Role of Lecturer's Academic Support in the Positive Relationship between Economics Students' Self-Regulated Learning and Academic Engagement

Research hypothesis six determined the moderating role lecturer's academic support (LAS) in the relationship between undergraduate Economics students' self-regulated learning and academic engagement. It is worth noting that, prior to examining this hypothesis, the findings from the PLS-SEM revealed that lecturer's academic support had a significant positive influence on Economics students' academic engagement. This discovery highlights the pivotal function of lecturer academic support in nurturing students' academic engagement. Moreover, it underscores the substantial influence lecturers wield in molding students' conduct by offering academic direction and emotional encouragement, thus contributing to their academic well-being within the learning milieu. This result is consistent with the findings of Liu et al. (2018), who reported that teacher support had a substantial positive impact on academic engagement. However, their research was limited to elementary and middle school students in China. Likewise, other studies (e.g., Miao & Ma, 2023; Sadoughi & Hejazi, 2023) revealed that teacher support positively influenced students' academic engagement.

For the actual hypothesis, the study showed that lecturer's academic support had a significant negative influence on the positive relationship between Economics students' self-regulated learning and academic engagement. This finding implies that lecturer's academic support weakens the positive relationship between self-regulated learning and academic engagement. This suggests that, contrary to expectations, higher levels of academic support from lecturers may somehow impede the positive impact of students' self-regulated learning on their academic engagement. More precisely, the higher lecturer's academic support the weaker the relationship between self-regulated learning and academic engagement. This outcome is noteworthy, as it represents the inaugural investigation to delineate the unfavourable moderating impact of lecturer academic support on the relationship between self-regulated learning and academic engagement within a higher education setting, particularly within the context of a developing nation.

This finding challenges traditional assumptions that increased academic support uniformly enhances students' academic outcomes (Azila-Gbettor & Abiemo, 2021) and prompts a closer examination of the intricate interplay between external support and students' self-regulation in the context of economics education. The finding of the study is not consistent with that of Azila-Gbettor and Abiemo (2021) who discovered that perceived lecturer support was a significant positive moderator in the relationship between between academic self-efficacy and study engagement.

Additionally the negative influence of lecturer's academic support implies the need for a nuanced approach to the provision of support within the educational setting. SRL theory posits that students actively control their learning processes through cognitive, metacognitive, and motivational strategies. When students develop strong SRL skills, they take initiative in setting goals, managing their time, seeking resources, and persisting through challenges. While academic support is generally considered beneficial, the study suggests that an excessive level or a specific type of support may inadvertently hinder the self-regulated learning processes that contribute to academic engagement. Educators and institutions should carefully assess the nature and quantity of academic support provided to economics students, considering the delicate balance required to foster students' autonomy and self-directed learning while still offering necessary guidance. This finding underscores the importance of tailoring academic support strategies to the individual needs and preferences of students, recognising that a one-size-fits-all approach may not always be conducive to optimal outcomes.

Moreover, engagement theory emphasises active participation, collaboration and meaningful learning experiences as key to student engagement. When students are highly self-regulated, they are naturally engaged in academic activities. However, when academic support from the lecturer is excessive or directive rather than facilitative, it can create a passive learning environment where students expect to be guided rather than actively engaged with the learning material. This misalignment between SRL and external support may explain why lecturer support negatively moderates the positive relationship between SRL and academic engagement - because students who rely too much on lecturer support may exhibit lower cognitive and behavioural engagement, reducing their overall engagement in learning.

Addtionally, the findings suggest that lecturers need to carefully balance academic support to enhance, rather than undermine, students' self-regulated learning and academic engagement. Rather than providing excessive guidance that fosters dependency, lecturers should use scaffolding techniques, providing structured support that gradually decreases as students develop greater autonomy. Encouraging self-directed learning strategies, such as goal setting, self-monitoring and reflection, can help students take ownership of their learning while still benefiting from academic support. In addition, lecturers should focus on facilitative rather than directive support, using inquiry-based teaching, problem-solving tasks and collaborative learning activities to encourage active engagement. Providing timely but minimal feedback, rather than constant intervention, can also build students' confidence in managing their own learning. In addition, professional development programmes should train teachers to differentiate support based on students' levels of self-regulation, ensuring that academic support is adaptive and promotes independence rather than dependency.

From a practical standpoint, the results suggest that educators and institutions should engage in open communication with students to better understand their preferences and needs regarding academic support. It also calls for a reflection on the nature of support provided, ensuring that it aligns with students' developmental stages and learning styles. The negative influence observed may prompt a reevaluation of the methods and extent of academic support, potentially prompting a shift towards fostering an environment that encourages self-regulated learning while still offering targeted and effective support when necessary. In essence, this finding encourages a more nuanced and individualised approach to academic support within the field of economics education.

The unexpected finding that lecturer's academic support had a negative influence on the positive relationship between self-regulated learning and academic engagement may be attributed to various factors within the higher education context. Firstly, it is possible that the manner in which academic support is provided by lecturers may inadvertently hinder the autonomy and self-regulation of students. If the support is perceived as overly directive or controlling, it could diminish students' sense of ownership over their learning process, counteracting the positive impact of self-regulated learning on academic engagement. This underscores the importance of considering the nature and quality of academic support in understanding its effects on student outcomes.

Also, the negative influence could be linked to potential mismatches between the type of support offered by lecturers and the specific needs of students engaged in self-regulated learning. For instance, if the support is not aligned with the individualised strategies and goals set by students in their self-regulated learning endeavours, it may create a dissonance that negatively impacts their overall academic engagement. This highlights the importance of personalised and adaptive support systems that complement and enhance students' self-regulation efforts rather than impeding them.

Lastly, organisational or institutional factors may play a role in shaping the dynamics between lecturer support, self-regulated learning, and academic engagement. Institutional policies, teaching methodologies, or even the cultural climate within the academic environment could influence how lecturer support is perceived and received by students. A mismatch between these institutional factors and the principles of self-regulated learning might result in the observed negative influence on the relationship between self-regulated learning and academic engagement. This finding underscores the need for a holistic understanding of the educational environment and the various components that contribute to students' learning experiences. Further investigation and qualitative exploration may be necessary to uncover the nuanced dynamics behind this unexpected relationship and inform strategies for optimising lecturer support in a way that synergistically fosters self-regulated learning and academic engagement.

Moderating Role of the Levels of Economics Students in the Relationship between Motivational Orientations and Self-Regulated Learning

This research hypothesis determined the moderating role of undergraduate Economics students' academic level in the relationship between motivational orientations and self-regulated learning. The study revealed that the academic level (100 to 400) of Economics students does not moderate the relationship between motivational orientations and self-regulated learning.

In this study, the focus was on exploring the potential moderating role of academic level within the field of Economics. The academic level, ranging from 100 to 400, is a key aspect of a student's educational journey, representing their progression through the curriculum. The central finding of the study, as revealed by the data analysis, was that the academic level of

Economics students does not play a moderating role in the relationship between motivational orientations and self-regulated learning.

This result challenges conventional assumptions about the impact of academic progression on the dynamics of motivation and self-regulated learning (van Dinther, Dochy & Segers, 2011; Zimmerman, 2009). Typically, one might expect that as students advance in their academic levels, the influence of motivational orientations on self-regulated learning would vary (Kitsantas, Winsler & Huie, 2008). However, the study's findings suggest that regardless of whether a student is in the early stages (100-level) or more advanced stages (400-level) of their Economics education, the relationship between their motivational orientations and self-regulated learning remains consistent and unaffected by their academic level.

This unexpected result challenges prevailing assumptions that posit a linear relationship between academic progression and the interplay of motivational orientations with self-regulated learning. Traditionally, it has been widely believed that as students advance through higher academic levels, the nature and strength of the connection between their motivational orientations and self-regulated learning would evolve. One might intuitively anticipate that the complexity of course content, the depth of subject matter, or even the students' familiarity with academic challenges would alter the dynamics of motivation and its impact on self-regulated learning.

However, the findings of this study defy these conventional expectations. Regardless of whether students find themselves at the introductory 100-level courses or the more advanced 400-level courses within the realm of Economics, the observed relationship between motivational orientations and self-regulated learning remains surprisingly consistent. This stability across academic levels suggests that the intricate interplay between motivation and self-regulated learning is not substantially influenced by the students' stage in their academic journey within the discipline of Economics.

This revelation prompts a reevaluation of the presumed trajectory of academic development in relation to self-regulated learning. It challenges educators and researchers to delve deeper into the intricacies of motivational factors and the mechanisms governing self-regulated learning, searching for more nuanced explanations that extend beyond the traditional linear progression paradigm. Such a departure from the anticipated academic-level-dependent variations in motivational influences opens up avenues for future research and underscores the importance of considering individual differences and contextual factors when examining the dynamics of learning motivation across various stages of academic education.

Mediating Role of Self-Regulated Learning in the Relationship between Motivational Orientations and Academic Engagement

The last research hypothesis determined the mediating role of undergraduate Economics students' self-regulated learning in the relationship between motivational orientations and academic engagement. The study's findings indicated that academic self-efficacy, mastery approach goal orientation, performance-avoidance goal orientation and task value orientation significantly influence academic engagement through self-regulated learning. However, control of learning beliefs, test anxiety, mastery avoidance, performance approach, intrinsic and extrinsic goal orientations revealed no significant indirect effects on academic engagement through self-regulated learning.

The findings are consistent with expectancy-value theory, which posits that students' motivation to engage in learning is driven by their expectations of success and the subjective value they place on academic tasks (Eccles & Wigfield, 2020; Rosenzweig, Wigfield & Eccles, 2022; Wigfield & Eccles, 2024). The significant mediating effects of academic self-efficacy, mastery approach goal orientation, performance avoidance goal orientation, and task value orientation suggest that students who believe in their ability to succeed and value academic tasks are more likely to engage in self-regulated learning, which subsequently increases their academic engagement. This is consistent with Zhang et al. (2022) and Zhong et al. (2023), who highlighted the role of academic self-efficacy in promoting engagement, but did not examine self-regulated learning as a mediator. The findings further suggest that students with mastery goals - those who strive for competence and improvement - are more likely to regulate their learning and maintain engagement, reinforcing the premise that motivation influences engagement through self-regulation.

From the perspective of self-regulated learning theory (Zimmerman & Schunk, 2001), the results confirm that self-regulated learning serves as a crucial mechanism linking motivational orientations to academic engagement. The significant mediation effects suggest that students who use self-regulation strategies such as goal setting, monitoring progress, and adapting learning strategies are better able to translate motivation into active engagement. This is consistent with Kara et al. (2024) who found self-regulated learning to be a mediator between personality traits and engagement in online learning.

However, the non-significant indirect effects of learning belief control, test anxiety, mastery avoidance, achievement approach, and intrinsic/extrinsic goal orientation suggest that self-regulation alone may not always facilitate engagement, particularly when motivation is externally driven or when students perceive learning as beyond their control. These findings contrast with Ghelichli et al. (2021) who found that self-regulated language learning did not mediate engagement and motivation, possibly due to differences in learning contexts and the homogeneity of their sample.

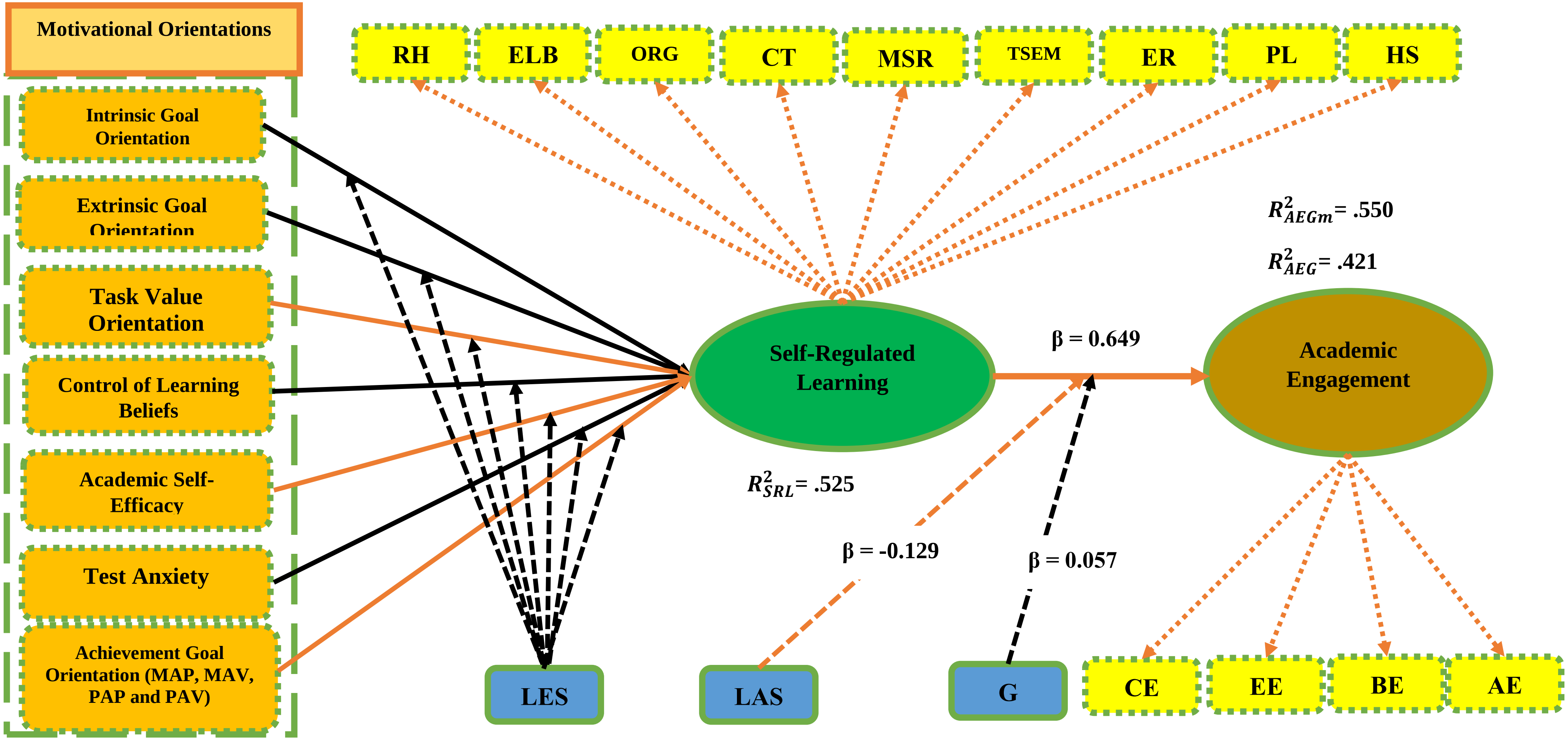
Furthermore, engagement theory (Kearsley & Schneiderman, 1999) emphasises that meaningful academic engagement results from active participation in the learning process, supported by self-regulated learning. The results of this study suggest that students who engage in self-regulation are more likely to sustain cognitive and behavioural engagement, particularly when they perceive academic tasks as valuable and align their goals with long-term achievement. This supports previous research suggesting that engagement is shaped not only by direct motivational influences, but also by students' ability to regulate their learning effectively (Setiani & Wijaya, 2020; Utami & Aslamawati, 2021; Zare et al., 2024). However, the findings also highlight that not all motivational orientations translate into engagement through self-regulation, highlighting the complexity of engagement as a multifaceted construct.

Revised Conceptual Framework

This section presents the revised conceptual framework of the study that was proposed based on the research questions and hypotheses. The framework examined the levels of higher education Economics students’ motivational orientations, self-regulated learning and academic engagement. The motivational orientation constructs are intrinsic goal orientation, extrinsic goal orientation, task value orientation, control of learning beliefs, academic self-efficacy, test anxiety, mastery approach goal orientation, mastery avoidance goal orientation, performance approach goal orientation and performance avoidance goal orientation. Self-regulated learning was a reflective-reflective higher order construct and it was examined using nine constructs such as rehearsal, elaboration, organisation, critical thinking, metacognitive self-regulation, time and study environment management, effort regulation, peer learning and help seeking. Additionally, academic engagement was examined using four constructs such as cognitive engagement, emotional engagement, behavioural engagement and agentic engagement.

The conceptual framework shows the intricate relationships between motivational orientations, self-regulated learning (SRL), and academic engagement within the context of Economics education. Drawing upon key motivational constructs, including task value orientation, academic self-efficacy, mastery approach goal orientation, and performance avoidance goal orientation, this revised framework endeavours to explore the nuanced influences of these motivational factors on students' SRL processes.

Furthermore, the research investigates the downstream impact of SRL on academic engagement, emphasising the pivotal role of students' self-directed learning strategies in fostering sustained interest and active participation in academic activities. The study also probes potential moderating effects based on academic level and gender, exploring whether these demographic variables alter the established relationships between motivational orientations, SRL, and academic engagement. Lastly, the study examines the mediating role of self-regulated learning in the relationship between motivational orientations and academic engagement. Figure 29 shows the revised conceptual framework of the study.


Motivational Orientations
Intrinsic Goal Orientation
Extrinsic Goal Orientation
Task Value Orientation
Control of Learning Beliefs
Academic Self-Efficacy
Test Anxiety
Achievement Goal Orientation (MAP, MAV, PAP and PAV)
RH
ELB
ORG
CT
MSR
TSEM
ER
PL
HS
Self-Regulated Learning
R^2_{SRL}= .525
β = 0.649
Academic Engagement
R^2_{AEGm}= .550
R^2_{AEG}= .421
β = -0.129
β = 0.057
LES
LAS
G
CE
EE
BE
AE

Note: R^2_{AEGm} = R-square when the moderators were introduced; MAV and PAP paths were not significant

Significant Direct Paths

Significant Moderating Path

Non-Significant Direct Paths

Non-Significant Moderating Paths

Note: The square dot lines show that the path is not significant

Figure 29: Revised Conceptual Framework
Source: Author's construct (2023).

Figure 29 shows that motivational orientations (such as academic self-efficacy, mastery approach goal orientation, performance avoidance goal orientation and task value orientation) significantly influence SRL, highlighting the importance of considering diverse motivational factors in understanding students' engagement with self-regulated learning processes. Interestingly, the academic level in Economics education emerges as a non-moderating variable, indicating that the observed relationships are consistent across different academic stages within the discipline.

Moreover, gender does not exert a moderating effect on the association between SRL and academic engagement, suggesting that the interplay between these variables remains consistent across male and female students in the Economics domain.

Contrary to expectations, the study reveals that lecturer's academic support dampens the relationship between SRL and academic engagement. This unexpected finding prompts a deeper exploration of the role of instructional support in shaping the dynamics between students' self-regulated learning efforts and their ultimate engagement in academic tasks.

Additionally, ASE, MAP, TVO and PAV significantly influence AEG through SRL. However, EGO, IGO, TA, PAP, CLB and MAV revealed no significant indirect effects on AEG through SRL.

In conclusion, this revised conceptual framework contributes valuable insights into the motivational underpinnings of self-regulated learning and its subsequent impact on academic engagement in Economics education. The findings underscore the need for a nuanced understanding of motivational factors, while also highlighting the complex interplay between instructional support and self-regulated learning outcomes. Implications for pedagogical practices and future research directions are discussed in light of these novel findings.

Chapter Summary

The current study examined Economics students' motivational orientations, self-regulated learning, and academic engagement in higher education by using a structural equation modelling approach. The findings revealed that higher education Economics students had high levels of intrinsic goal orientation, extrinsic goal orientation, task value orientation, control of learning beliefs, academic self-efficacy, mastery approach goal orientation, mastery avoidance goal orientation, performance approach goal orientation, and performance avoidance goal orientation. However, students exhibited moderate level of test anxiety.

In addition, the study showed that Economics students exhibited a high level of self-regulated learning. The study revealed that the level of students' academic engagement was high. Specifically, the students exhibited high levels of behavioural, cognitive, and emotional engagement. However, students' level of agentic engagement was moderate. The findings of the study indicated that academic self-efficacy, mastery approach goal orientation, performance avoidance goal orientation and task value orientation had significant influence on Economics students' self-regulated learning. Conversely, control of learning beliefs, test anxiety, mastery avoidance, performance approach, intrinsic and extrinsic goal orientations had no significant effect on self-regulated learning.

Furthermore, Economics students' self-regulated learning had a statistically significant positive influence on their academic engagement. Also, some of the dimensions (e.g., organisation, critical thinking, time and study environment management, peer learning, and help seeking) of self-regulated learning had significant positive influence on academic engagement. Unexpectedly, metacognitive self-regulation had a significant negative influence on academic engagement. However, rehearsal, elaboration and effort regulation had no significant influence on academic engagement.

Moreover, the study indicated that gender does not moderate the positive relationship between self-regulated learning and academic engagement. Additionally, the study showed that the academic level of Economics students did not moderate the relationship between motivational orientations and self-regulated learning. Finally, the results showed that ASE, MAP, TVO and PAV significantly influence AEG through SRL. However, EGO, IGO, TA, PAP, CLB and MAV revealed no significant indirect effects on AEG through SRL. The subsequent chapter provides the summary, conclusions and recommendations.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Overview

The chapter summarises the study, emphasising the research methods employed in collecting and analysing data to obtain the main findings in addressing the research questions and hypotheses formulated on undergraduate Economics students' motivational orientations, self-regulated learning and academic engagement through the lens of Structural Equation Modelling (SEM). Based on the key findings, conclusions are drawn to provide suitable recommendations to inform and guide policy. The contributions of the study to theory, practice, as well as suggestions for further studies have been captured.

Summary of the Study

The current study examined Economics students' motivational orientations, self-regulated learning and academic engagement through a hybrid-staged modelling process (PLS-SEM-ANN). Consequently, the following research questions were formulated to guide the study:

1. What is the level of motivational oritentations of undergraduate economics students?
2. What is the level of undergraduate Economics students' self-regulated learning?
3. What is the level of undergraduate Economics students' academic engagement?

In order to comprehend these issues, the following research hypotheses were posed:

1. H_0: There is no statistically significant difference in Economics students' self-regulated learning based on gender and academic level.
2. H_0: There is no statistically significant difference in Economics students' academic engagement based on gender and academic level.
3. H_0: There is no statistically significant influence of Economics students' motivational orientations on their self-regulated learning.
4. H_0: There is no statistically significant influence of Economics students' self-regulated learning on their academic engagement.
5. H_0: Gender does not moderate the relationship between Economics students' self-regulated learning and academic engagement.
6. H_0: Lecturer's academic support does not moderate the relationship between Economics students' self-regulated learning and academic engagement.
7. H_0: Levels of Economics students does not moderate the relationship between Economics students' motivational orientations and self-regulated learning.
8. H_0: Undergraduate Economics students' self-regulated learning does not mediate the relationship between their motivational orientations and academic engagement.

The study drew knowledge and insight from the following theories: Expectancy-value, self-regulated learning, and engagement theories. These theories helped in examining Economics students' motivational orientations, self-regulated learning and academic engagement. Also, the theories directed the study in theorising the influence of Economics students' motivational orientations on self-regulated learning, and the influence of self-regulated learning on academic engagement.

Grounded in a positivist philosophical framework, this study adopted a quantitative research approach. A descriptive cross-sectional survey design was employed to investigate the motivational orientations, self-regulated learning, and academic engagement of higher-education economics students. The targeted population for this study consisted of 497 B.Ed Social Sciences (Economics) students enrolled for the academic year 2022-2023 in the University of Cape Coast. Respondents were selected through the census method, encompassing all 497 undergraduate economics students within the specified academic year. To collect data on motivational orientations, self-regulated learning, academic engagement, and lecturer academic support, scales from reputable sources were used. Specifically, the Motivational Orientations Scale (Elliot & Murayama, 2008; Pintrich et al., 1993), the Self-Regulated Learning Scale (Pintrich et al., 1993), the Academic Engagement Scale (Maroco et al., 2016; Veiga, 2016), and the Lecturer Academic Support Scale (Johnson et al., 1983). To ensure the effectiveness and clarity of the instruments, a pilot test was conducted on a sample of 50 randomly selected economics students.

Additionally, all the adapted scales were subjected to confirmatory factor analysis (CFA) through the use of AMOS. The model fit indices (goodness of fit indices; CFI, SRMR) confirmed that the MOS, SRL, AEG and LAS models fit the data gathered. The reliability coefficients (e.g., α_{ASE} = .870; α_{TVO} = .862; α_{AEG} = .903; α_{ORG} = .763) and MacDonald omega values (e.g., ω_{CT} = .776; ω_{BE} = .864; ω_{AEG} = .887; ω_{SRL} = .945) revealed that internal consistency had been achieved. Also, face and content validity of the instruments were ensured by experts in the field of Economics education and the researcher's supervisors. In addition, the AVE values and HTMT ratios revealed that convergent and discriminant validity were achieved in the study, respectively.

Before commencing data collection, approval was obtained through an Ethical Clearance letter from the Institutional Review Board (IRB) and a corresponding introductory letter from the researcher's department. Additionally, the participants were presented with an informed consent form, seeking their agreement to participate in the study. The study strictly followed all ethical guidelines the University of Cape Coast mandated. Questionnaires were then disseminated to 497 economics students, with a total of 452 questionnaires successfully collected from the participants, resulting in a commendable return rate of 90.95%. Notably, the collected data exhibited no missing data, outliers, or admissible values, thereby ensuring the integrity and completeness of the dataset.

An evaluation of statistical assumptions was conducted to ascertain the suitability of statistical tools for addressing the research objectives. Participants' Demographic details were examined using frequencies, percentages, and clustered bar graphs. Descriptive statistics were used to analyse the data, including means and standard deviations. Additionally, inferential statistics, such as Repeated Measures ANOVA, 2-way MANOVA, Structural Equation Modeling (SEM) employing both Partial Least Squares SEM (PLS-SEM) and Covariance-Based SEM (CB-SEM), and Artificial Neural Network (ANN), were employed for the comprehensive analysis of the collected data concerning the research questions and hypotheses.

Key Findings

The analysis of the results revealed the following findings:

1. Economics students exhibited high levels of intrinsic goal orientation, extrinsic goal orientation, task value orientation, control of learning beliefs, academic self-efficacy, mastery approach goal orientation, mastery avoidance goal orientation, performance-approach goal orientation and performance-avoidance goal orientation. However, students exhibited moderate levels of test anxiety.
2. Economics students demonstrated a high level of self-regulated learning.
3. Economics had a high level of academic engagement. Specifically, it was revealed that Economics students had high level of cognitive, emotional and behavioural engagement. However, Economics had a moderate level of agentic engagement.
4. The study revealed no significant differences in students' self-regulated learning based on gender and academic level.
5. It was found that there was no significant difference in academic engagement based on gender and academic level. However, at the univariate level, it was discovered that there was a significant difference in Economics students' agentic engagement based on gender. Additionally, significant differences were identified in both behavioural and agentic engagement based on students' academic level.
6. The study's findings indicated that academic self-efficacy, mastery approach goal orientation, performance-avoidance goal orientation and

task value orientation had a significant influence on Economics students' self-regulated learning. However, control of learning beliefs, test anxiety, mastery avoidance, performance approach, intrinsic and extrinsic goal orientations had no significant effect on self-regulated learning.

7. Economics students' self-regulated learning had a statistically significant positive influence on their academic engagement. Also, some of the dimensions (e.g., organisation, critical thinking, time and study environment management, peer learning, and help seeking) of self-regulated learning significantly influenced academic engagement.
8. The findings of the study revealed that gender had no significant moderating role in the positive relationship between Economics students' self-regulated learning and academic engagement.
9. The study showed that lecturer's academic support significantly negatively influenced the positive relationship between Economics students' self-regulated learning and academic engagement.
10. The study revealed that the academic level of Economics students does not moderate the relationship between motivational orientations and self-regulated learning.
11. The findings of the study indicated that ASE, MAP, TVO and PAV significantly influence AEG through SRL. However, EGO, IGO, TA, PAP, CLB and MAV revealed no significant indirect effects on AEG through SRL.

Conclusions

1. Higher education students are driven by an inherent interest in Economics, valuing learning for its own sake. Also, it can be concluded that higher education students perceive the content of their Economics courses as valuable and relevant to their personal and professional lives. Additionally, the emphasis on extrinsic goal orientation highlights the importance of external rewards, such as grades and career prospects, in motivating students. Moreover, the high academic self-efficacy among these students indicates a strong confidence in their ability to succeed academically in Economics. Lastly, the presence of performance-approach and performance-avoidance goal orientations indicates a competitive aspect in students' motivation, where they aim to outperform peers or avoid being outperformed.
2. Higher education Economics students have the capacity for autonomous learning and adaptive strategies in academic pursuits. In addition, Economics students are well equipped to navigate complex and challenging academic content, making them capable of independent and critical thinking.
3. Higher education Economics students are deeply involved in processing and understanding economic concepts, while high emotional engagement reflects their positive emotional responses and investment in the subject matter. Behavioural engagement, characterised by participation and effort, further demonstrates their active involvement in learning activities. However, the moderate level

of agentic engagement, which involves students taking initiative, expressing preferences, and making choices in their learning processes, suggests a potential area for improvement. This discrepancy implies that while students are engaged in their learning, they may not feel fully empowered to influence or direct their educational experiences.

4. The level of self-regulated learning among Economics students in higher education is not sensitive to gender and academic level, suggesting a universal application of self-regulation skills across different demographic groups and academic levels. Therefore, the capacity for self-regulated learning among Economics students is uniformly distributed across different genders and academic stages, indicating a broad, equitable potential for academic success and personal growth within this discipline.
5. It can be concluded that higher education Economics students' level of academic engagement is independent of the interaction effect of gender and academic level.
6. Higher education Economics students' motivational orientation serves as a fundamental driver of self-regulated learning, enabling them to set challenging goals, persevere in the face of difficulties, and use effective learning strategies.
7. Higher education Economics students who effectively manage their learning processes - through goal setting, self-monitoring and adaptive strategies - are more likely to exhibit higher levels of cognitive, emotional and behavioural engagement in their studies. This reinforces

the pivotal role of autonomous learning strategies in promoting higher level of academic engagement.

8. The beneficial impact of self-regulated learning on academic engagement is consistent across male and female students, indicating a universal applicability of self-regulation learning strategies regardless of gender.
9. It can be concluded that excessive academic support may weaken the positive influence of self-regulated learning on academic engagement. This implies that while self-regulated learning independently promotes higher levels of academic engagement, excessive or perhaps misdirected academic support from lecturers may inadvertently undermine this relationship. It points to a potential over-reliance on external guidance at the expense of the development of autonomous learning skills.
10. It can be concluded that the motivational orientations of Economics students had a consistent influence on their self-regulated learning, regardless of their academic level. This suggests that whether students are at introductory or advanced levels of their academic journey in Economics, their motivational orientations - such as goal orientation, task value orientation and academic self-efficacy - consistently contribute to their ability to regulate their own learning processes effectively.
11. The findings suggest that certain motivational factors, such as academic self-efficacy, mastery approach goal orientation, performance-avoidance goal orientation and task value orientation,

play a crucial role in enhancing academic engagement through self-regulated learning, while others do not show a significant influence. This suggests that students' self-confidence, mastery motivation and perceived task value are more effective in promoting engagement than control beliefs, test anxiety or goal orientation alone. These findings highlight the selective impact of self-regulatory mechanisms on academic engagement, and emphasise the varying degrees to which different motivational constructs contribute to students' learning experiences.

Recommendations

The findings suggest some crucial actions that higher education providers must take to boost students' self-regulated learning and academic engagement. Most importantly, to ensure that a conducive environment is created for self-regulated learning strategies and academic engagement, it is recommended that:

1. Developers of Economics curricula in higher education should ensure that courses remain theoretically rigorous while addressing contemporary economic challenges by integrating case-based learning, real-world data analysis and industry collaborations. Incorporating guest lectures from economists and policymakers, hands-on data analysis using global economic reports, and simulations of economic policymaking can enhance students' ability to apply theoretical knowledge to practical issues.

   In addition, capstone projects, internships with financial institutions or government agencies, and experiential learning opportunities can bridge the gap between academic learning and professional practice. To further enhance the relevance of economics education, universities should use economic modelling software, AI-driven analytical tools and online financial platforms to equip students with essential analytical skills. Students, in turn, should actively engage in independent research, seek internships, participate in policy debates and apply classroom knowledge to real-world economic discussions to enhance their understanding and practical competence in the field.

2. Curriculum developers and Economics educators should design Economics curricula that challenge these students intellectually while providing opportunities for independent learning and problem solving. Emphasising active learning techniques such as case studies, simulations and research projects can further enhance their self-regulation skills. In addition, providing structured yet flexible learning environments that support self-directed inquiry and continuous reflection will help foster the development of these competencies, ultimately leading to a deeper understanding and more meaningful engagement with economic theories and applications.
3. The identified high level of academic engagement within Economics programmes underscores the success of current engagement strategies. Educators and institutions can build upon these practices, promoting active learning methodologies, collaborative projects, and student involvement in academic activities. Also, lecturers should focus on creating more opportunities for student agency by incorporating elements of choice, fostering a participatory classroom environment,

and encouraging student input in curriculum design and instructional strategies. By enhancing agentic engagement, Economics education can become more holistic, fostering not only active and invested learners but also autonomous and self-directed individuals.

4. Higher education educators, especially those teaching economics, should focus on creating a quality learning environment that fosters agentic engagement, where students take the initiative in their learning process. Lecturers can achieve this by encouraging open discussion, integrating problem-based learning and allowing students to make choices in their coursework, such as choosing research topics or case studies. Providing constructive feedback that encourages self-reflection, using interactive teaching methods such as debates and simulations, and incorporating real-world economic issues can further stimulate students' active participation. In addition, lecturers should create a psychologically safe environment where students feel comfortable asking questions, challenging ideas and proposing solutions.

   Universities can also implement peer-led learning programmes, mentoring opportunities and student-led economic forums to enhance student agency. To maximise their engagement, students should proactively participate in class discussions, take initiative in collaborative projects, seek clarification on complex issues and independently explore contemporary economic issues beyond the curriculum. They should also make use of academic support services, join Economics-related student organisations and actively participate in research and internships to deepen their understanding and application of economic concepts.

5. Curriculum developers and educators who would like to promote self-regulated learning can apply their methods universally to all students without the need for gender or level-specific adaptations. Educators can focus on developing and implementing teaching practices that promote self-regulation, such as goal setting, self-monitoring and reflective practice, confident that these approaches will be equally effective for all students.
6. Higher education lecturers can implement strategies to increase engagement with confidence that they will be equally effective across gender and academic level. This also highlights the potential for universal teaching practices that can maintain and further enhance academic engagement for all students, ensuring equitable access to high quality learning experiences and optimising educational outcomes in economics without the need for gender or level specific modifications.
7. Given the positive influence of mastery approach goal orientation, academic self-efficacy, and task value orientation on self-regulated learning, higher education institutions should develop and introduce policies to improve students' mastery approach goal orientation, academic self-efficacy, and task value orientation. For instance, lecturers should be encouraged to provide constructive feedback to students that emphasises their strengths, progress, and areas for

improvement, thereby bolstering academic self-efficacy and reinforcing mastery approach goal orientation.

Also, this might involve designing assignments that emphasise learning progress and improvement rather than just grades and incorporating real-world relevance into course materials to enhance task value. Additionally, Economics students should actively develop strategies such as time management, critical thinking, and help-seeking behaviors to enhance their learning experience.

8. Higher education institutions, curriculum developers and educators should therefore prioritise instructional practices that promote self-regulation, such as teaching metacognitive strategies, encouraging reflective practice and providing opportunities for autonomous learning. By embedding these practices in the curriculum, educators can create a more engaging and interactive learning environment that not only improves students' academic performance, but also promotes sustained interest and investment in the subject matter. This holistic approach ensures that students are better equipped to navigate the complexities of economics, leading to deeper understanding and more meaningful academic experiences.
9. Lecturers should aim to strike a balance by providing support that encourages independence rather than dependency, fostering an environment where students are empowered to take initiative and responsibility for their learning. Effective academic support should be designed to complement and enhance students' self-regulatory capacities, promoting a more nuanced approach that facilitates self-

efficacy and independent problem-solving while still providing necessary guidance. This balanced approach ensures that students remain actively engaged in their learning processes and take full advantage of self-regulated learning to achieve deeper and more sustained academic engagement.

Moreover, higher education institutions should prioritise enhancing lecturer-student academic support systems to mitigate the weakening effect observed in the positive relationship between self-regulated learning and academic engagement among economics students. Instituting policies that promote regular training and development opportunities for lecturers in effective academic support strategies is crucial. Also, fostering a culture that values and prioritises meaningful interactions between lecturers and students can significantly strengthen this relationship.

10. It is recommended that higher education institutions and lecturers focus on cultivating motivational factors throughout the curriculum, with the aim of enhancing students' intrinsic motivation, goal-setting skills and perceptions of the relevance of Economics content. By doing so, educators can foster a learning environment that supports the development of self-regulated learning skills at all levels of academic study in economics, thereby promoting deeper engagement and more meaningful learning outcomes regardless of students' academic standing.
11. Students should cultivate self-regulated learning strategies by developing confidence in their abilities, setting mastery-oriented goals

and recognising the value of academic tasks to increase engagement. Also, parents should provide a supportive environment that fosters motivation and minimises anxiety to ensure that students remain focused on their academic goals. Higher education institutions and educators should continue to develop policies and curricula that emphasise goal setting, self-efficacy and task value to promote sustained student engagement and academic success.

Contributions of the Study

The study has substantially contributed to informing policy, practice, knowledge, theory and methods.

Contributions made to policy

1. Higher education authorities should consider integrating modules or courses on self-regulated learning within the curriculum of higher education programmes. These courses can equip students with essential skills for self-regulation and independence in learning.
2. This finding informs policy by suggesting the need for interventions tailored to enhance agentic engagement among higher education economics students, acknowledging the current moderate level. Policymakers can develop initiatives to foster a greater sense of agency and autonomy within economics curricula, potentially through innovative pedagogical approaches or experiential learning opportunities, to further elevate students' active involvement and investment in their academic pursuits.
3. The finding of the study elucidates the intricate relationship between various motivational factors and self-regulated learning processes

within academic contexts. By demonstrating the significant influence of academic self-efficacy, mastery approach goal orientation, performance-avoidance goal orientation, and task value orientation on self-regulated learning, policymakers are encouraged to develop multifaceted interventions that target these motivational constructs to enhance students' capacity for self-regulation. Implementing tailored strategies that address these factors holds promise for fostering more effective learning environments and facilitating students' academic success.

Contributions made to practice

The following contributions are significant in promoting self-regulated learning and academic engagement among higher education students:

1. The research underscores the importance of balancing autonomy and guidance in the learning process. It suggests that students benefit from opportunities to develop and exercise their self-regulated learning skills independently. However, excessive lecturer support may inadvertently hinder students' ability to take ownership of their learning, potentially diminishing their engagement and motivation.
2. The finding has practical implications for pedagogical approaches in higher education, especially in economics. Educators and curriculum designers can use this knowledge to refine their teaching strategies. They can design courses and instructional materials that encourage self-regulated learning while recognising the need for appropriate levels of academic support. This insight can inform the development of more effective and student-centred teaching practices.

3. Educators and institutions can use this finding to inform their teaching and support practices. They can adopt a gender-neutral approach to promoting self-regulated learning skills, recognising that both male and female students can benefit equally from these strategies. This can lead to more inclusive and effective educational practices.

Contributions made to knowledge

The following unique findings have been identified in the study:

1. Economics students' self-regulated learning and academic engagement were not susceptible to the interaction effect of gender and academic level.
2. Economics students had high self-regulated learning, translating into high academic engagement. This study provides additional evidence that organisation, critical thinking, time and study environment management, peer learning, and help-seeking has a positive influence on academic engagement
3. This study contributes to the literature by establishing that gender does not mediate the positive nexus between self-regulated learning and academic engagement.
4. The finding that lecturer's academic support dampens the positive relationship between Higher Education Economics Students' self-regulated learning and academic engagement represents a noteworthy contribution to the body of knowledge in education, psychology, Economics education and higher education. This finding sheds light on the complexity of academic support within the higher education context. While academic support is generally regarded as a positive

factor for student success, this research highlights that its effects are not universally beneficial. By revealing that excessive or overbearing lecturer academic support can mitigate the positive impact of self-regulated learning, the study adds nuance to our understanding of lecturer's academic support in the nexus between self-regulated learning and academic engagement.

5. Lastly, the findings contribute to understanding the mediating role of SRL in the relationship between motivational constructs and academic engagement. The significant mediation effects suggest that ASE, MAP, PAV, and TVO enhance AEG through the development of SRL strategies, reinforcing the importance of self-regulation as a mechanism linking motivation to engagement.

Contributions to theory

The following contributions of the study to theory have been realised:

1. Self-regulated learning had a significant influence on students' academic engagement. This finding augments engagement theory by highlighting the pivotal role of self-regulated learning in fostering students' academic engagement. By elucidating the significant influence of self-regulated learning on engagement, this research underscores the importance of individuals' proactive regulation of their cognitive and affective processes in educational contexts.
2. The finding supports self-regulated learning theory that emphasises the importance of self-regulated learning for student success. However, it also suggests that lecturer academic support can negatively impact

self-regulated learning if provided in a way that does not encourage students to take charge of their own learning.

3. The study contributes to the self-regulated learning theory by suggesting that excessive academic support can compromise students' autonomy, reducing intrinsic motivation and self-regulated learning and, subsequently, academic engagement.

Contributions to methods

The study has made significant contributions to research methods, particularly in analysing the influence of motivational orientations on self-regulated learning and the impact of self-regulated learning on academic engagement. These contributions can be summarised as follows:

1. The study has advanced methodological practices by integrating Partial Least Squares Structural Equation Modelling (PLS-SEM) and Artificial Neural Network (ANN). This combined approach offers a comprehensive and robust analysis of the relationships between motivational orientations, self-regulated learning, and academic engagement. By leveraging the strengths of PLS-SEM for initial path analysis and employing ANN to assess robustness, the research methodology demonstrates a sophisticated and holistic analytical strategy.
2. The utilisation of ANN in the research methodology is particularly noteworthy as it allows for exploring non-linear relationships between variables. Traditional linear modelling techniques may overlook these complex associations. The study's approach enables a deeper

understanding of how motivational orientations and self-regulated learning interact, considering potential non-linear patterns.

3. By combining PLS-SEM and ANN, the study strengthens the validity and generalisability of its findings. PLS-SEM provides a strong foundation for initial structural equation modelling, ensuring the robustness of the core relationships examined. The subsequent application of ANN offers additional insights and helps validate the results, making them more reliable and applicable to broader contexts.
4. The research sets a valuable precedent for future studies in the field of educational research. The successful integration of PLS-SEM and ANN demonstrates the feasibility and benefits of using these complementary methods for investigating complex relationships in Economics education. This pioneering approach encourages other researchers to adopt similar strategies to enhance the rigour and depth of their analyses.
5. The study employed joint use of covariance-based structural equation modelling (CB-SEM) and PLS-SEM to examine the influence of self-regulated learning on academic engagement.
6. The application of multi-group analysis in examining the moderating role of students' academic level in the relationship between motivational orientations and self-regulated learning is novel in Economics education.

Suggestions for Further Studies

The study concentrated on Economics students' motivational orientations, self-regulated learning and academic engagement through a structural equation modelling approach. Hence, future research should focus on:

1. examining the effect of Economics students' self-regulated learning and academic engagement on their academic performance.
2. investigating the moderating role of students' academic level in the relationship between self-regulated learning and academic engagement.
3. analysing the mediating roles of self-regulated learning dimensions in the relationship between motivational orientations and academic engagement.
4. determining the moderating roles of social support, peer support and emotional support in the nexus between self-regulated learning and academic engagement of higher education students.
5. ascertaining the variations in Economics students' motivational orientations based on gender, age and academic level.
6. examining the interaction effect of gender and age on Economics students' self-regulated learning and academic engagement.
7. Conduct longitudinal studies to examine how motivational orientations, self-regulated learning, and academic engagement evolve. This can provide insights into the developmental trajectories of these constructs and how they influence each other across different stages of higher education.

8. assessing how integrating technology and using various learning environments (e.g., online courses, blended learning) affect motivational orientations, self-regulated learning strategies, and academic engagement among economics students.

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APPENDICES

APPENDIX A

UNIVERSITY OF CAPE COAST

COLLEGE OF EDUCATION STUDIES

FACULTY OF HUMANITIES AND SOCIAL SCIENCES EDUCATION

DEPARTMENT OF BUSINESS AND SOCIAL SCIENCES EDUCATION

QUESTIONNAIRE FOR ECONOMICS STUDENTS

Dear Respondent,

This questionnaire is to help the researcher to collect data on **Economics students' motivational orientations, self-regulated learning and academic engagement in Higher Education**. This study is solely for academic purposes. Please, kindly provide sincere and objective responses to the items in this instrument. I assure you that any information provided will be treated as strictly confidential.

SECTION A: Demography of Economics Students

Please, write or tick (√) where appropriate in the box corresponding to your choice concerning each statement.

1. Gender: Male [ ] Female [ ]
2. Age:…………………………………………………………….
3. Academic Level: 100 [ ] 200 [ ] 300 [ ] 400 [

INSTRUCTION: *Please tick (√) in the appropriate box that reflect your level of agreement or disagreement with each statement on the Likert Scale items for Section B to E.*

SECTION B

MOTIVATIONAL ORIENTATIONS OF ECONOMICS STUDENTS

Key: 1 = Not at all true of me (NT); 2 = Rarely true of me (RT); Sometimes true of me (ST) = 3; 4 = Often true of me (OT) and 5 = Very true of me (VT)

S/N	Statements	NT 1	RT 2	ST 3	OT 4	VT 5
IGO1	I prefer Economics course material that really challenges me so I can learn new things.					
IGO2	I prefer Economics course material that arouses my curiosity, even if it is difficult to learn.					
IGO3	The most satisfying thing for me in this Economics course is trying to understand the content as thoroughly as possible.					
IGO4	When I have the opportunity in this Economics class, I choose course assignments that I can learn from even if they do not guarantee a good grade.					
EGO1	Getting a good grade in this Economics class is the most satisfying thing for me right now.					
EGO2	The most important thing for me right now is improving my overall grade point average, so my main concern in this Economics class is getting a good grade.					
EGO3	If I can, I will like to get better grades in this Economics class than most of the other students.					
EGO4	I want to do well in this Economics class because it is important to show my ability to my family, friends, employer, or others.					
TVO1	I think I will be able to use what I learn in this Economics course in other courses.					
TVO2	It is important for me to learn the course material in this Economics class.					
TVO3	I am very much interested in the content area of this Economics course.					
TVO4	I think the Economics course material in this class is useful for me to learn.					
TVO5	I like the subject matter of this Economics course.					
TVO6	Understanding the subject matter of this					

	Economics course is very important to me.					
CLB1	If I study in appropriate ways, then I will be able to learn the material in this Economics course.					
CLB2	It will be my own fault if I do not learn the material in this Economics course.					
CLB3	If I try hard enough, then I will understand the Economics course material.					
CLB4	If I do not understand the Economics course material, it is because I didn't try hard enough.					
ASE1	I believe I will receive an excellent grade in this Economics class.					
ASE2	I am certain I can understand the most difficult material presented in the readings for this Economics course.					
ASE3	I am confident I can understand the basic concepts taught in this Economics course.					
ASE4	I am confident I can understand the most complex material presented by the lecturer in this Economics course.					
ASE5	I am confident I can do an excellent job on the assignments and tests in this Economics course.					
ASE6	I expect to do well in this Economics class.					
ASE7	I am certain I can master the skills being taught in this Economics class.					
ASE8	Considering the difficulty level of this course, the lecturer, and my skills, I think I will do well in this Economics class.					
TA1	When I take an Economics test I think about how poorly I am doing compared with other students.					
TA2	When I take an Economics test I think about items on other parts of the test I cannot answer.					
TA3	When I take Economics tests I think of the consequences of failing.					
TA4	I have an uneasy, upset feeling when I take an Economics examination.					
TA5	I feel my heart beating fast when I take an Economics examination.					
MAP1	My aim is to completely master the material presented in this Economics					

	class.					
MAP2	My goal is to learn as much as possible.					
MAP3	I am striving to understand the content of this Economics course as thoroughly as possible.					
MAV1	My aim is to avoid learning less than I possibly could.					
MAV2	My goal is to avoid learning less than it is possible to learn.					
MAV3	I am striving to avoid an incomplete understanding of the Economics course material.					
PAP1	I am striving to do well compared to other students.					
PAP2	My aim is to perform well relative to other students.					
PAP3	My goal is to perform better in this Economics class than the other students.					
PAV1	My goal is to avoid performing poorly in this Economics class compared to other students.					
PAV2	I am striving to avoid performing worse than others.					
PAV3	My aim is to avoid doing worse than other students.					

SECTION C

SELF-REGULATED LEARNING OF ECONOMICS STUDENTS

Key: 1 = Not at all true of me (NT); 2 = Rarely true of me (RT); Sometimes true of me (ST) = 3; 4 = Often true of me (OT) and 5 = Very true of me (VT)

S/N	Statements	NT 1	RT 2	ST 3	OT 4	VT 5
RH1	When I study for this Economics class, I practice saying the material to myself over and over.					
RH2	When studying for this class, I read my class notes and the course materials (e.g., handouts and textbooks) over and over again.					
RH3	I memorise key words to remind me of important concepts in this Economics class.					
RH4	I make lists of important terms for this Economics course and memorise the lists.					
ELB1	When I study for this Economics class, I pull together information from different sources, such as lectures, course materials, and discussions.					
ELB2	I try to relate ideas in this Economics course to those in other courses whenever possible.					
ELB3	When reading for this Economics class, I try to relate the material to what I already know.					
ELB4	When I study for this Economics course, I write brief summaries of the main ideas from the readings and the concepts from the lectures.					
ELB5	I try to understand the material in this Economics class by making connections between the readings and the concepts from the lectures.					
ELB6	I try to apply ideas from Economics course materials (e.g., handouts and textbooks) in other class activities such as lectures and discussions.					
ORG1	When I study the materials (e.g., handouts and textbooks) for this Economics course, I outline the material to help me organise my thoughts.					

ORG2	When I study for this Economics course, I go through the materials (e.g., handouts and textbooks) and my class notes and try to find out the most important ideas.					
ORG3	I make simple charts, diagrams, or tables to help me organise Economics course material.					
ORG4	When I study for this Economics course, I go over my class notes and make an outline of important concepts.					
CT1	I often find myself questioning things I hear or read in this Economics course to decide if I find them convincing.					
CT2	When a theory, interpretation, or conclusion is presented in this Economics class or in the Economics course material, I try to decide if there is good supporting evidence.					
CT3	I treat the Economics course material as a starting point and try to develop my own ideas about it.					
CT4	I try to play around with ideas of my own related to what I am learning in this Economics course.					
CT5	Whenever I read or hear an assertion or conclusion in this Economics class, I think about possible alternatives.					
MSR1	During class time I often miss important points because I am thinking of other things.*					
MSR2	When reading for this Economics course, I make up questions to help focus my reading.					
MSR3	When I become confused about something I am reading for this Economics class, I go back and try to figure it out.					
MSR4	If the Economics course materials are difficult to understand, I change the way I read the material.					
MSR5	Before I study new Economics course material thoroughly, I often skim it to see how it is organised.					
MSR6	I ask myself questions to make sure I understand the materials (e.g., handouts and textbooks) I have been studying in this Economics class.					
MSR7	I try to change the way I study in order					

	to fit the Economics course requirements and instructor's teaching style.					
MSR8	I often find that I have been reading for Economics class but don't know what it was all about.*					
MSR9	I try to think through a topic and decide what I am supposed to learn from it rather than just reading it over when studying.					
MSR10	When studying for this Economics course, I try to determine which concepts I don't understand well.					
MSR11	When I study for this Economics class, I set goals for myself in order to direct my activities in each study period.					
MSR12	If I get confused taking notes in this Economics class, I make sure I sort it out afterwards.					
TSEM1	I usually study in a place where I can concentrate on my Economics course work.					
TSEM2	I make good use of my study time for this Economics course.					
TSEM3	I find it hard to stick to a study schedule.*					
TSEM4	I have a regular place set aside for studying.					
TSEM5	I make sure I keep up with the weekly readings and assignments for this Economics course.					
TSEM6	I attend Economics class regularly.					
TSEM7	I often find that I don't spend very much time on this Economics course because of other activities.*					
TSEM8	I rarely find time to review my notes or course materials (e.g., handouts and textbooks) before an examination.					
ER1	I often feel so lazy or bored when I study for this Economics class that I quit before I finish what I planned to do.*					
ER2	I work hard to do well in this Economics class even if I do not like what we are doing.					
ER3	When Economics course work is difficult, I give up or only study the easy parts.*					
ER4	Even when Economics course materials					

	are dull and uninteresting, I manage to keep working until I finish.					
PL1	When studying for this Economics course, I often try to explain the material to a classmate or a friend.					
PL2	I try to work with other students from this class to complete the Economics course assignments.					
PL3	When studying for this Economics course, I often set aside time to discuss the course material with a group of students from the class.					
HS1	Even if I have trouble learning the material in this Economics class, I try to do the work on my own, without help from anyone.*					
HS2	I ask the instructor to clarify concepts I do not understand well.					
HS3	When I cannot understand the material in this Economics course, I ask another student in this class for help.					
HS4	I try to identify students in this Economics class whom I can ask for help if necessary.					

SECTION D
ACADEMIC ENGAGEMENT OF ECONOMICS STUDENTS

Key: 1 = Strongly Disagree (SD); 2 = Disagree (D); Moderately Agree (MA) = 3; 4 = Agree (A) and 5 = Strongly Agree (SA)

S/N	Statements	SD 1	D 2	MA 3	A 4	SA 5
BE1	I pay attention in Economics class.					
BE2	I follow the rules and regulations in the Economics class.					
BE3	I usually do my Economics assignments on time.					
BE4	When I have doubts, I ask questions and participate in activities in the Economics class.					
BE5	I usually participate actively in Economics group assignments and discussions.					
EE1	I do not feel very accomplished in this Economics course. *					
EE2	I feel excited about the Economics course work.					
EE3	I like being in Economics class all the time.					
EE4	I am interested in the Economics course work.					
EE5	Economics classroom is an interesting place to be.					
CE1	When I read an Economics textbook (or handout), I reflect on it to make sure I understand the concept I am reading about.					
CE2	I talk to people outside the school on matters that I learned in class.					
CE3	If I do not understand the meaning of a word, I try to solve the problem, for example by consulting a dictionary or seeking the assistance of a colleague.					
CE4	I try to use the knowledge I have gained in solving new problems in class.					
CE5	I try to integrate subjects from different courses into my general understanding.					
AE1	During Economics lecture, I ask questions.					
AE2	I tell the lecturer what I like and what I do not like					
AE3	I let my lecturer know what I am interested in.					
AE4	During Economics lecture, I express my preferences and opinions.					
AE5	I offer suggestions to my Economics lecturer about how to make the Economics class better.					

SECTION E

LECTURER ACADEMIC SUPPORT

Key: 1 = Strongly Disagree (SD); 2 = Disagree (D); Moderately Agree (MA) = 3; 4 = Agree (A) and 5 = Strongly Agree (SA)

S/N	Statements	SD 1	D 2	MA 3	A 4	SA 5
LAS1	My lecturer cares about how much I learn in this Economics course.					
LAS2	My lecturer likes to see my Economics assignments and presentations.					
LAS3	My lecturer likes to help me learn in this Economics course.					
LAS4	My lecturer wants me to do my best in this Economics course.					
LAS5	My lecturer's questions help me to understand the concepts and theories in Economics.					

APPENDIX D

Consent Form

Dear Cherished Respondent,

I am currently undertaking a research investigation and would appreciate your cooperation. If you are willing to take part, the survey is expected to occupy approximately 25-35 minutes of your time.

Your assistance in completing the provided questionnaire is highly valued, as it aims to assess your **motivational orientations, self-regulated learning, and academic engagement in the learning of Economics**.

Please rest assured that your responses will remain anonymous, and no personal information about you will be solicited for any purpose whatsoever. Your participation contributes significantly to the integrity and comprehensiveness of this research.

Please sign the space provided below

Thank you.

I……………………………………………………….agree to participate

APPENDIX E

Normality Test for Motivational Orientations and Lecturer Academic Support Constructs/Variables

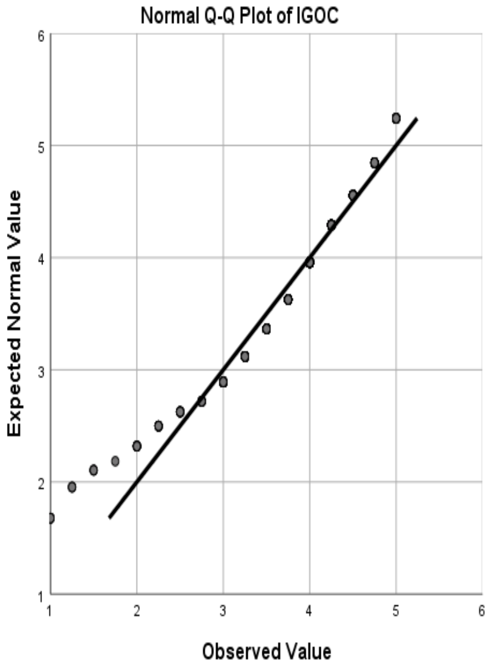


Figure 1: Q-Q plot for intrinsic goal orientation
Source: Fieldwork (2023)

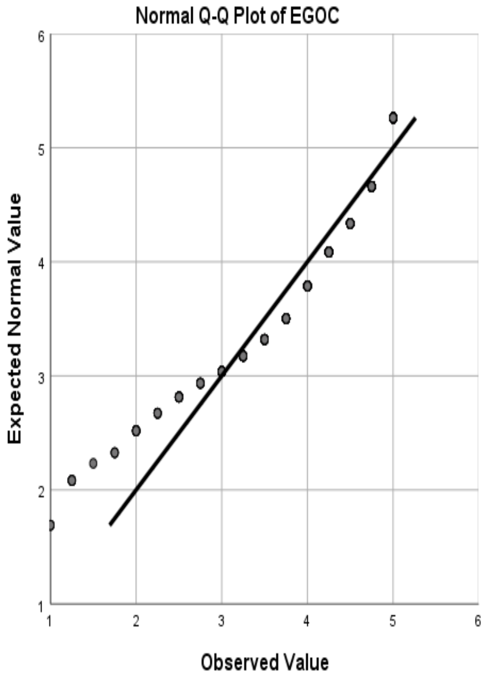


Figure 2: Q-Q plot for extrinsic goal orientation
Source: Fieldwork (2023)

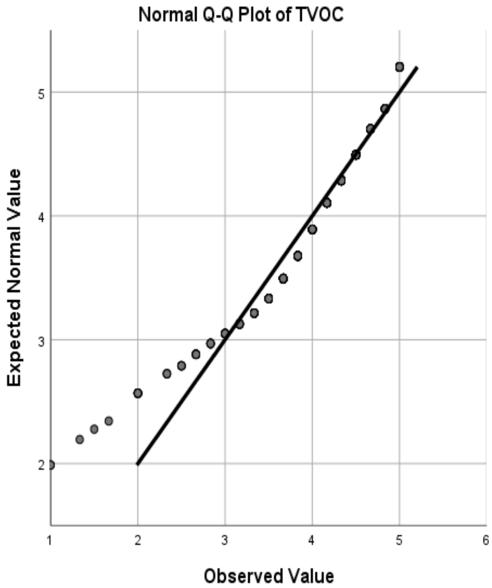


Figure 3: Q-Q plot for task value orientation
Source: Fieldwork (2023)

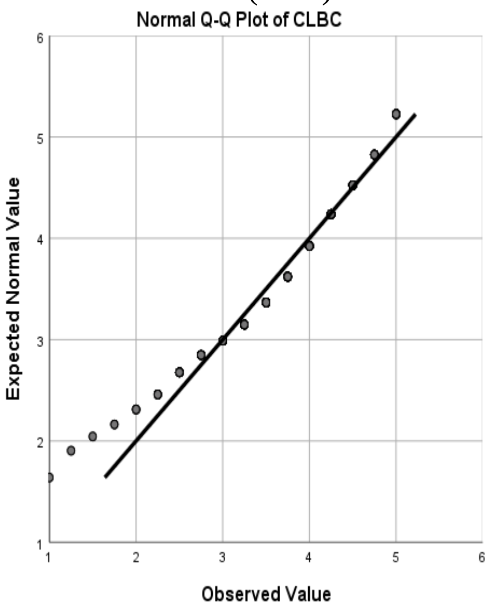


Figure 4: Q-Q plot for control of learning beliefs
Source: Fieldwork (2023)

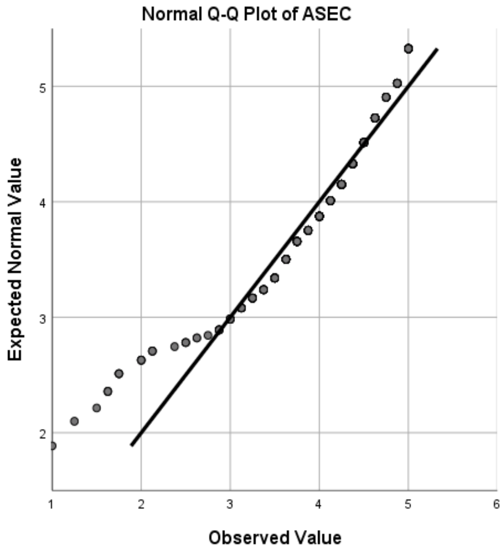


Figure 5: Q-Q plot for academic self-efficacy

Source: Fieldwork (2023)

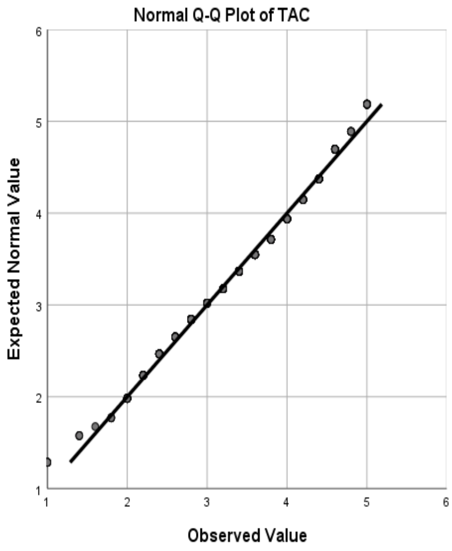


Figure 6: Q-Q plot for test anxiety

Source: Fieldwork (2023)

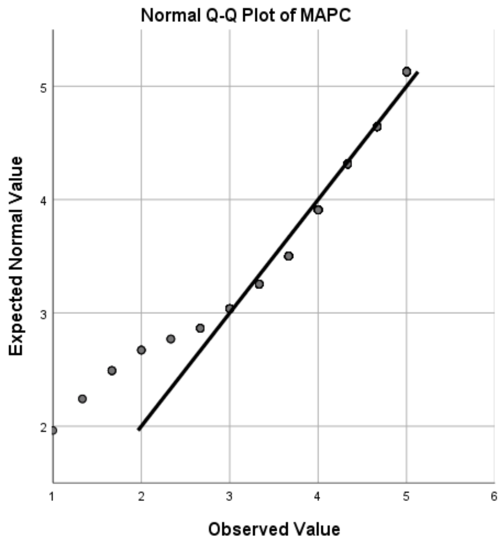


Figure 7: Q-Q plot for mastery approach goal orientation

Source: Fieldwork (2023)

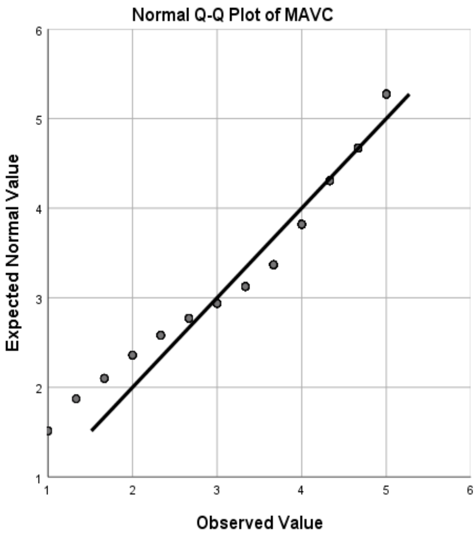


Figure 8: Q-Q plot for mastery avoidance goal orientation

Source: Fieldwork (2023)

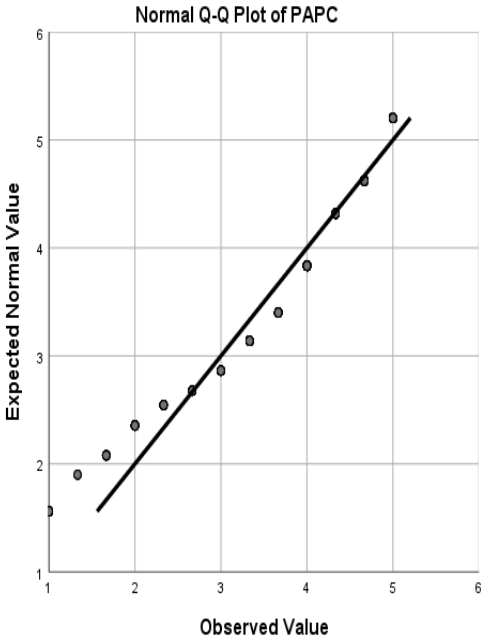


Figure 9: Q-Q plot for performance approach goal orientation
Source: Fieldwork (2023)

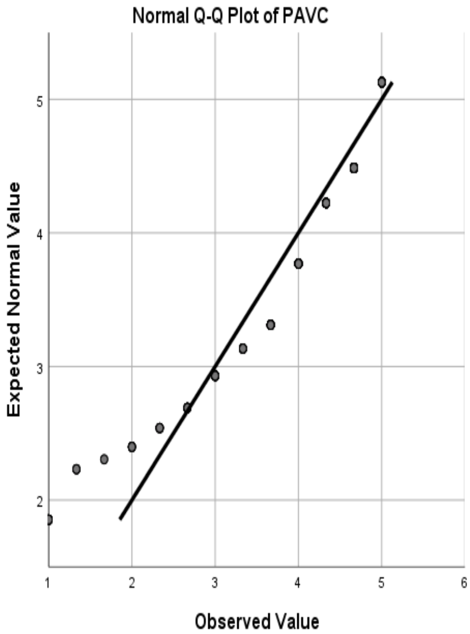


Figure 10: Q-Q plot for performance avoidance goal orientation
Source: Fieldwork (2023)

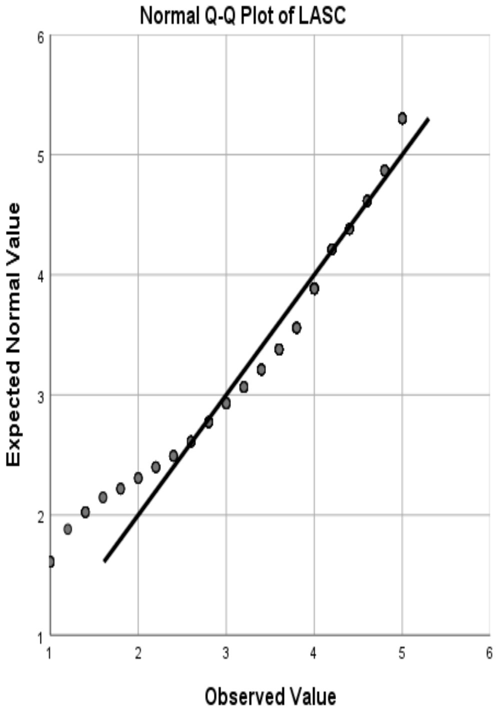


Figure 11: Q-Q plot for lecturer academic support
Source: Fieldwork (2023)

APPENDIX F

Detailed Results for Univariate and Madia's Multivariate Skewness and Kurtosis

Sample size: 452
Number of variables: 22

Univariate skewness and kurtosis

	Skewness	SE_skew	Z_skew	Kurtosis	SE_kurt	Z_kurt
RHC	-1.187	0.115	-10.341	1.512	0.229	6.600
ELBC	-1.273	0.115	-11.082	2.551	0.229	11.130
ORGC	-0.995	0.115	-8.668	1.403	0.229	6.124
CTC	-1.103	0.115	-9.601	2.279	0.229	9.944
MSRC	-1.174	0.115	-10.228	2.160	0.229	9.427
TSEMC	-1.250	0.115	-10.882	2.824	0.229	12.325
ERC	0.444	0.115	3.870	-0.793	0.229	-3.459
PLC	-0.858	0.115	-7.470	0.712	0.229	3.107
HSC	-0.599	0.115	-5.213	1.337	0.229	5.832
AcademicEngagement	-0.843	0.115	-7.344	1.255	0.229	5.478
IGOC	-0.920	0.115	-8.014	1.265	0.229	5.519
EGOC	-1.268	0.115	-11.040	1.367	0.229	5.966
TVOC	-1.181	0.115	-10.289	2.042	0.229	8.911
CLBC	-0.835	0.115	-7.271	0.851	0.229	3.714
ASEC	-1.256	0.115	-10.941	2.312	0.229	10.090
TAC	-0.277	0.115	-2.414	-0.321	0.229	-1.402
MAPC	-1.225	0.115	-10.664	2.476	0.229	10.805
MAVC	-0.957	0.115	-8.336	0.408	0.229	1.781
PAPC	-0.908	0.115	-7.911	0.330	0.229	1.438
PAVC	-1.240	0.115	-10.794	1.152	0.229	5.027
SRLC	-0.936	0.115	-8.154	1.970	0.229	8.596
LASC	-0.959	0.115	-8.350	0.748	0.229	3.262

Mardia's multivariate skewness and kurtosis

	b	z	p-value
Skewness	88.57337	6672.52754	0
Kurtosis	616.63424	28.99404	0

APPENDIX G

Detailed Motivational Orientations Results

S/N	Statements/Items	*M*	*SD*
IGO1	I prefer Economics course material that really challenges me so I can learn new things.	3.67	1.11
IGO2	I prefer Economics course material that arouses my curiosity, even if it is difficult to learn.	3.81	1.05
IGO3	The most satisfying thing for me in this Economics course is trying to understand the content as thoroughly as possible.	3.96	0.96
IGO4	When I have the opportunity in this Economics class, I choose course assignments that I can learn from even if they do not guarantee a good grade.	3.39	1.15
EGO1	Getting a good grade in this Economics class is the most satisfying thing for me right now.	4.12	1.07
EGO2	The most important thing for me right now is improving my overall grade point average, so my main concern in this Economics class is getting a good grade.	4.18	1.04
EGO3	If I can, I will like to get better grades in this Economics class than most of the other students.	3.89	1.14
EGO4	I want to do well in this Economics class because it is important to show my ability to my family, friends, employer, or others.	4.06	1.05
TVO1	I think I will be able to use what I learn in this Economics course in other courses.	3.99	0.97
TVO2	It is important for me to learn the course material in this Economics class.	4.06	0.92
TVO3	I am very much interested in the content area of this Economics course.	3.95	0.95
TVO4	I think the Economics course material in this class is useful for me to learn.	4.01	0.96
TVO5	I like the subject matter of this Economics course.	3.93	0.99
TVO6	Understanding the subject matter of this Economics course is very important to me.	4.18	0.85
CLB1	If I study in appropriate ways, then I will be able to learn the material in this Economics course.	4.07	0.95
CLB2	It will be my own fault if I do not learn the material in this Economics course.	3.80	1.09
CLB3	If I try hard enough, then I will understand the Economics course material.	3.95	0.92
CLB4	If I do not understand the Economics course material, it is because I didn't try hard enough.	3.34	1.29
ASE1	I believe I will receive an excellent grade in this Economics class.	4.09	1.04
ASE2	I am certain I can understand the most difficult material presented in the readings for this Economics course.	3.66	1.05
ASE3	I am confident I can understand the basic concepts taught in this Economics course.	4.02	0.95
ASE4	I am confident I can understand the most complex material presented by the lecturer in this Economics course.	3.68	1.02
ASE5	I am confident I can do an excellent job on the assignments and tests in this Economics course.	4.03	0.91

ASE6	I expect to do well in this Economics class.	4.29	0.87
ASE7	I am certain I can master the skills being taught in this Economics class.	4.08	0.91
ASE8	Considering the difficulty level of this course, the lecturer, and my skills, I think I will do well in this Economics class.	3.95	0.96
TA1	When I take a test I think about how poorly I am doing compared with other students.	3.41	1.21
TA2	When I take a test I think about items on other parts of the test I cannot answer.	3.79	1.02
TA3	When I take tests I think of the consequences of failing.	3.59	1.21
TA4	I have an uneasy, upset feeling when I take an Economics examination.	3.09	1.29
TA5	I feel my heart beating fast when I take an Economics examination.	3.22	1.27
MAP1	My aim is to completely master the material presented in this Economics class.	4.08	0.92
MAP2	My goal is to learn as much as possible.	4.31	0.82
MAP3	I am striving to understand the content of this Economics course as thoroughly as possible.	3.83	1.02
MAV1	My aim is to avoid learning less than I possibly could.	3.66	1.19
MAV2	My goal is to avoid learning less than it is possible to learn.	3.69	1.20
MAV3	I am striving to avoid an incomplete understanding of the Economics course material.	3.93	1.01
PAP1	I am striving to do well compared to other students.	3.73	1.12
PAP2	My aim is to perform well relative to other students.	3.82	1.14
PAP3	My goal is to perform better than the other students.	3.60	1.21
PAV1	My goal is to avoid performing poorly compared to others.	3.95	1.15
PAV2	I am striving to avoid performing worse than others.	3.94	1.19
PAV3	My aim is to avoid doing worse than other students.	3.95	1.16

Note: *M* = Mean; *SD* = Standard Deviation

APPENDIX H

Detailed Self-Regulated Learning Results

S/N	Statements/Items	*M*	*SD*
RH1	When I study for this Economics class, I practice saying the material to myself over and over.	3.65	1.13
RH2	When studying for this class, I read my class notes and the course materials (e.g., handouts and textbooks) over and over again.	3.84	1.00
RH3	I memorise key words to remind me of important concepts in this Economics class.	3.95	0.99
RH4	I make lists of important terms for this Economics course and memorise the lists.	3.83	1.00
ELB1	When I study for this class, I pull together information from different sources, such as lectures, course materials, and discussions.	3.85	1.01
ELB2	I try to relate ideas in this Economics course to those in other courses whenever possible.	3.94	0.95
ELB3	When reading for this Economics class, I try to relate the material to what I already know.	4.06	0.88
ELB4	When I study for this Economics course, I write brief summaries of the main ideas from the readings and the concepts from the lectures.	3.83	0.99
ELB5	I try to understand the material in this Economics class by making connections between the readings and the concepts from the lectures.	3.95	0.93
ELB6	I try to apply ideas from Economics course materials (e.g., handouts and textbooks) in other class activities such as lectures and discussions.	3.93	0.85
ORG1	When I study the materials (e.g., handouts and textbooks) for this Economics course, I outline the material to help me organise my thoughts.	3.95	0.95
ORG2	When I study for this Economics course, I go through the materials (e.g., handouts and textbooks) and my class notes and try to find out the most important ideas.	3.99	0.95
ORG3	I make simple charts, diagrams, or tables to help me organise Economics course material.	3.70	1.05
ORG4	When I study for this Economics course, I go over my class notes and make an outline of important concepts.	3.88	0.94
CT1	I often find myself questioning things I hear or read in this Economics course to decide if I find them convincing.	3.90	0.91
CT2	When a theory, interpretation, or conclusion is presented in class or in the course material, I try to decide if there is good supporting evidence.	3.79	0.92
CT3	I treat the Economics course material as a starting point and try to develop my own ideas about it.	3.88	0.89

CT4	I try to play around with ideas of my own related to what I am learning in this Economics course.	3.82	0.92
CT5	Whenever I read or hear an assertion or conclusion in this Economics class, I think about possible alternatives.	3.85	0.94
MSR1*	**During class time I often miss important points because I am thinking of other things.***		
MSR2*	**When reading for this Economics course, I make up questions to help focus my reading.**		
MSR3	When I become confused about something I am reading for this Economics class, I go back and try to figure it out.	4.02	0.88
MSR4	If the Economics course materials are difficult to understand, I change the way I read the material.	3.97	0.88
MSR5	Before I study new Economics course material thoroughly, I often skim it to see how it is organised.	3.91	1.01
MSR6	I ask myself questions to make sure I understand the materials (e.g., handouts and textbooks) I have been studying in this Economics class.	3.96	0.91
MSR7	I try to change the way I study in order to fit the Economics course requirements and instructor's teaching style.	3.93	0.98
MSR8*	**I often find that I have been reading for Economics class but don't know what it was all about.***		
MSR9*	**I try to think through a topic and decide what I am supposed to learn from it rather than just reading it over when studying.**		
MSR10	When studying for this Economics course, I try to determine which concepts I don't understand well.	3.93	0.88
MSR11	When I study for this Economics class, I set goals for myself in order to direct my activities in each study period.	3.89	0.98
MSR12*	**If I get confused taking notes in this Economics class, I make sure I sort it out afterwards.**		
TSEM1	I usually study in a place where I can concentrate on my Economics course work.	4.02	0.93
TSEM2	I make good use of my study time for this Economics course.	3.95	0.93
TSEM3*	**I find it hard to stick to a study schedule.***		
TSEM4	I have a regular place set aside for studying.	3.69	1.07
TSEM5	I make sure I keep up with the weekly readings and assignments for this Economics course.	3.83	1.01
TSEM6	I attend Economics class/lecture regularly.	4.32	0.86
TSEM7*	**I often find that I don't spend very much time on this Economics course because of other activities.***		
TSEM8*	**I rarely find time to review my notes or course materials (e.g., handouts and textbooks) before an examination.**		

ER1	I often feel so lazy or bored when I study for this Economics class that I quit before I finish what I planned to do.*	2.75	1.23
ER2*	**I work hard to do well in this Economics class even if I do not like what we are doing.**		
ER3	When Economics course work is difficult, I give up or only study the easy parts.*	2.81	1.29
ER4*	**Even when Economics course materials are dull and uninteresting, I manage to keep working until I finish.**		
PL1	When studying for this Economics course, I often try to explain the material to a classmate or a friend.	3.76	1.00
PL2	I try to work with other students from this class to complete the Economics course assignments.	3.91	0.97
PL3	When studying for this Economics course, I often set aside time to discuss the course material with a group of students from the class.	3.72	1.05
HS1*	**Even if I have trouble learning the material in this Economics class, I try to do the work on my own, without help from anyone.***		
HS2	I ask the instructor to clarify concepts I do not understand well.	3.53	1.12
HS3	When I cannot understand the material in this Economics course, I ask another student in this class for help.	3.92	0.93
HS4	I try to identify students in this Economics class whom I can ask for help if necessary.	3.98	0.92

Note: the bolded items were deleted because of low factor loading (FL).

APPENDIX I

Detailed Academic Engagement Results

S/N	Statements/Items	*M*	*SD*
BE1	I pay attention in Economics class.	4.24	0.99
BE2	I follow the rules and regulations in the Economics class.	4.37	0.86
BE3	I usually do my Economics assignments on time.	4.30	0.88
BE4	When I have doubts, I ask questions and participate in activities in the Economics class.	4.06	1.01
BE5	I usually participate actively in Economics group assignments and discussions.	4.14	0.96
EE1*	**I do not feel very accomplished in this Economics course. ***		
EE2	I feel excited about the Economics course work.	3.88	0.95
EE3	I like being in Economics class all the time.	3.97	1.05
EE4	I am interested in the Economics course work.	4.00	0.93
EE5	Economics classroom is an interesting place to be.	4.05	0.91
CE1	When I read an Economics textbook (or handout), I reflect on it to make sure I understand the concept I am reading about.	4.14	0.82
CE2	I talk to people outside the school on matters that I learned in class.	3.86	1.04
CE3	If I do not understand the meaning of a word, I try to solve the problem, for example by consulting a dictionary or seeking the assistance of a colleague.	4.18	0.85
CE4	I try to use the knowledge I have gained in solving new problems in class.	4.12	0.85
CE5	I try to integrate subjects from different courses into my general understanding.	4.10	0.85
AE1	During Economics lecture, I ask questions.	3.62	1.18
AE2	I tell the lecturer what I like and what I do not like	3.19	1.34
AE3	I let my lecturer know what I am interested in.	3.26	1.30
AE4	During Economics lecture, I express my preferences and opinions.	3.39	1.31
AE5	I offer suggestions about how to make the Economics class better.	3.48	1.29

Note: the bolded item was deleted because of low FL.

APPENDIX J

Levene's Test of Equality of Error Variances for Differences in SRL based on Gender and LES

		Levene Statistic	df1	df2	Sig.
RH	Based on Mean	.638	7	444	.724
	Based on Median	.579	7	444	.773
	Based on Median and with adjusted df	.579	7	428.258	.773
	Based on trimmed mean	.689	7	444	.681
ELB	Based on Mean	1.640	7	444	.122
	Based on Median	1.083	7	444	.373
	Based on Median and with adjusted df	1.083	7	378.892	.374
	Based on trimmed mean	1.312	7	444	.243
ORG	Based on Mean	1.403	7	444	.202
	Based on Median	1.024	7	444	.413
	Based on Median and with adjusted df	1.024	7	407.698	.413
	Based on trimmed mean	1.277	7	444	.260
CT	Based on Mean	1.984	7	444	.056
	Based on Median	1.304	7	444	.247
	Based on Median and with adjusted df	1.304	7	379.451	.247
	Based on trimmed mean	1.774	7	444	.091
MSR	Based on Mean	1.509	7	444	.162
	Based on Median	1.217	7	444	.292
	Based on Median and with adjusted df	1.217	7	387.852	.292
	Based on trimmed mean	1.262	7	444	.268
TSEM	Based on Mean	1.498	7	444	.166
	Based on Median	1.311	7	444	.243
	Based on Median and with adjusted df	1.311	7	392.141	.243
	Based on trimmed mean	1.474	7	444	.174
ER	Based on Mean	.448	7	444	.872
	Based on Median	.518	7	444	.821
	Based on Median and with adjusted df	.518	7	395.226	.821
	Based on trimmed mean	.527	7	444	.814
PL	Based on Mean	1.143	7	444	.335
	Based on Median	.564	7	444	.785
	Based on Median and with adjusted df	.564	7	392.460	.785
	Based on trimmed mean	.942	7	444	.474
HS	Based on Mean	1.765	7	444	.093
	Based on Median	1.416	7	444	.197
	Based on Median and with adjusted df	1.416	7	388.493	.197
	Based on trimmed mean	1.629	7	444	.125

APPENDIX K

Levene's Test of Equality of Error Variances for Differences in AEG based on Gender and LES

		Levene Statistic	df1	df2	Sig.
BE	Based on Mean	1.505	7	444	.116
	Based on Median	1.340	7	444	.124
	Based on Median and with adjusted df	1.340	7	347.011	.124
	Based on trimmed mean	1.247	7	444	.130
EE	Based on Mean	1.380	7	444	.121
	Based on Median	1.693	7	444	.109
	Based on Median and with adjusted df	1.693	7	377.011	.109
	Based on trimmed mean	1.086	7	444	.144
CE	Based on Mean	1.500	7	444	.165
	Based on Median	1.430	7	444	.191
	Based on Median and with adjusted df	1.430	7	370.997	.192
	Based on trimmed mean	1.493	7	444	.168
AE	Based on Mean	1.412	7	444	.130
	Based on Median	1.307	7	444	.126
	Based on Median and with adjusted df	1.307	7	429.107	.126
	Based on trimmed mean	1.442	7	444	.158

APPENDIX L

Results of Harman single factor analysis

Total Variance Explained

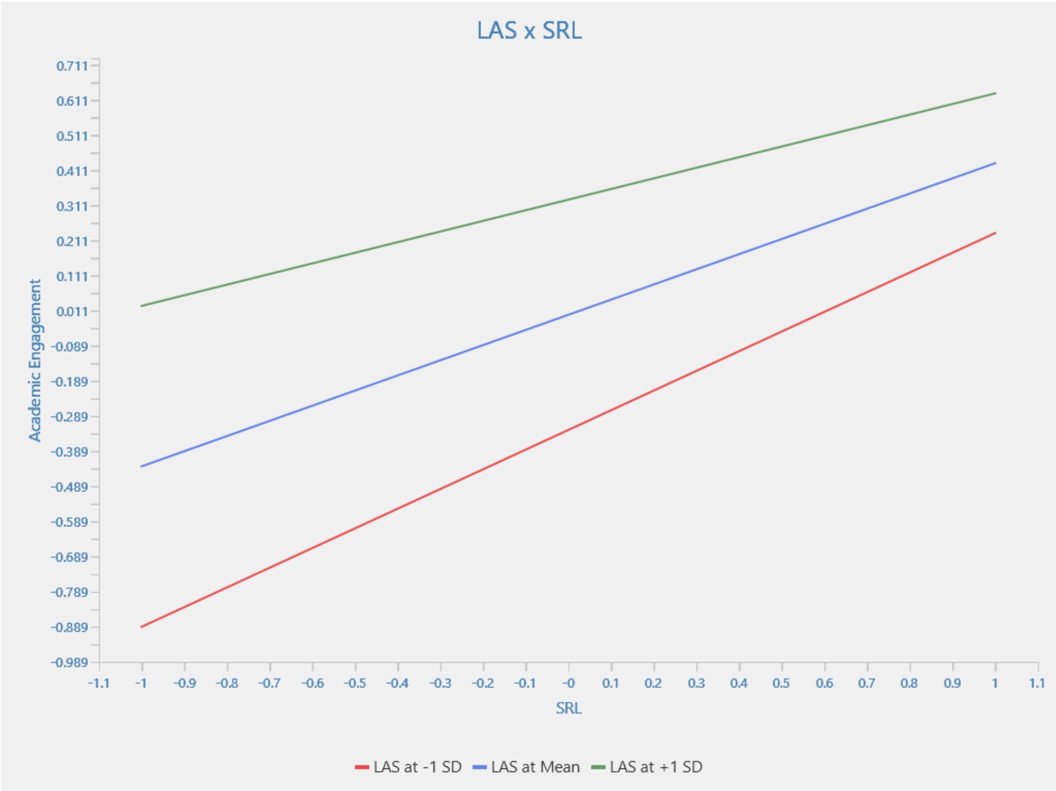
Factor	Initial Eigenvalues Total	Initial Eigenvalues % of Variance	Initial Eigenvalues Cumulative %	Extraction Sums of Squared Loadings Total	Extraction Sums of Squared Loadings % of Variance	Extraction Sums of Squared Loadings Cumulative %
1	28.421	24.086	24.086	27.716	23.488	23.488
2	8.166	6.920	31.006			
3	5.110	4.330	35.336			
4	4.301	3.645	38.981			
5	3.356	2.844	41.826			
6	2.793	2.367	44.193			
7	2.465	2.089	46.282			
8	2.254	1.910	48.192			
9	2.207	1.871	50.063			
10	1.975	1.674	51.736			
11	1.941	1.645	53.381			
12	1.795	1.522	54.903			
13	1.733	1.469	56.372			
14	1.681	1.424	57.796			
15	1.519	1.287	59.084			
16	1.451	1.230	60.313			
17	1.395	1.182	61.496			
18	1.360	1.153	62.648			
19	1.292	1.095	63.743			
20	1.235	1.046	64.790			
21	1.177	.998	65.788			
22	1.145	.970	66.757			
23	1.113	.943	67.701			
24	1.079	.915	68.615			
25	1.055	.894	69.509			
26	1.038	.879	70.389			
27	1.001	.849	71.237			
28	.963	.816	72.053			
29	.931	.789	72.843			
30	.905	.767	73.609			
31	.874	.741	74.350			
32	.865	.733	75.083			
33	.816	.691	75.775			
34	.800	.678	76.453			
35	.781	.662	77.114			
36	.751	.636	77.751			
37	.742	.629	78.380			
38	.721	.611	78.991			
39	.692	.587	79.577			
40	.688	.583	80.160			
41	.678	.575	80.735			

42	.650	.551	81.286
43	.634	.538	81.824
44	.628	.532	82.356
45	.619	.524	82.880
46	.615	.521	83.401
47	.588	.498	83.899
48	.578	.490	84.389
49	.567	.480	84.869
50	.554	.470	85.339
51	.537	.455	85.794
52	.521	.442	86.236
53	.512	.434	86.670
54	.494	.419	87.089
55	.480	.407	87.496
56	.475	.402	87.899
57	.468	.397	88.296
58	.461	.390	88.686
59	.447	.379	89.065
60	.434	.368	89.433
61	.416	.353	89.785
62	.406	.344	90.129
63	.390	.330	90.460
64	.388	.329	90.788
65	.373	.316	91.104
66	.368	.312	91.416
67	.358	.304	91.720
68	.347	.294	92.014
69	.342	.290	92.304
70	.340	.288	92.592
71	.329	.279	92.871
72	.328	.278	93.149
73	.317	.269	93.418
74	.304	.258	93.675
75	.301	.255	93.930
76	.294	.249	94.180
77	.287	.243	94.423
78	.277	.235	94.657
79	.273	.231	94.889
80	.265	.225	95.114
81	.263	.223	95.336
82	.252	.214	95.550
83	.250	.212	95.762
84	.240	.203	95.965
85	.232	.197	96.162
86	.220	.186	96.348
87	.216	.183	96.531
88	.213	.181	96.712
89	.208	.176	96.888
90	.198	.167	97.056
91	.191	.162	97.217

92	.183	.155	97.372
93	.181	.153	97.525
94	.176	.149	97.674
95	.171	.145	97.819
96	.164	.139	97.958
97	.162	.137	98.095
98	.161	.136	98.231
99	.150	.127	98.359
100	.150	.127	98.486
101	.137	.116	98.602
102	.130	.110	98.711
103	.125	.106	98.817
104	.125	.106	98.923
105	.120	.102	99.025
106	.112	.095	99.121
107	.111	.094	99.215
108	.108	.092	99.306
109	.101	.086	99.392
110	.100	.085	99.477
111	.096	.081	99.558
112	.094	.079	99.638
113	.080	.068	99.706
114	.078	.066	99.772
115	.073	.062	99.834
116	.070	.060	99.894
117	.066	.056	99.949
118	.060	.051	100.000

APPENDIX M

Slope Analysis Graph from the SmartPLS Software for the Moderating Role of LAS in the Relationship between Self-regulated Learning and Academic Engagement



APPENDIX N

Cross Loadings for LOC (MO AND SRL)

	ASE	CLB	CT	EGO	ELB	ER	HS	IGO	MAP	MAV	MSR	ORG	PAP	PAV	PL	RH	TA	TSEM	TVO
ASE1	**0.797**	0.574	0.379	0.523	0.499	0.052	0.257	0.456	0.557	0.294	0.482	0.438	0.365	0.337	0.273	0.455	0.132	0.419	0.607
ASE2	**0.589**	0.480	0.333	0.359	0.375	-0.046	0.214	0.329	0.354	0.226	0.354	0.339	0.259	0.171	0.154	0.305	0.103	0.308	0.428
ASE3	**0.726**	0.525	0.392	0.396	0.527	0.088	0.355	0.378	0.478	0.214	0.499	0.451	0.282	0.392	0.251	0.415	0.013	0.479	0.572
ASE5	**0.776**	0.435	0.407	0.444	0.477	-0.020	0.247	0.419	0.516	0.280	0.449	0.377	0.284	0.281	0.265	0.393	0.120	0.385	0.563
ASE6	**0.826**	0.506	0.400	0.481	0.485	0.019	0.333	0.493	0.601	0.239	0.427	0.411	0.262	0.295	0.299	0.439	0.166	0.377	0.616
ASE7	**0.803**	0.558	0.417	0.393	0.488	0.018	0.294	0.462	0.581	0.250	0.434	0.391	0.184	0.202	0.352	0.397	0.107	0.394	0.610
ASE8	**0.721**	0.375	0.358	0.388	0.421	0.010	0.283	0.346	0.472	0.253	0.377	0.372	0.230	0.257	0.387	0.405	0.143	0.363	0.479
CLB1	0.566	**0.789**	0.385	0.423	0.492	0.040	0.276	0.381	0.517	0.284	0.425	0.374	0.246	0.269	0.219	0.355	0.142	0.336	0.608
CLB2	0.436	**0.744**	0.311	0.357	0.337	0.083	0.218	0.255	0.296	0.265	0.390	0.270	0.168	0.237	0.130	0.289	0.079	0.350	0.467
CLB3	0.527	**0.777**	0.343	0.364	0.428	0.037	0.173	0.319	0.421	0.246	0.393	0.274	0.167	0.187	0.227	0.295	0.110	0.324	0.484
CLB4	0.351	**0.574**	0.261	0.311	0.263	-0.040	0.213	0.242	0.239	0.110	0.190	0.354	0.339	0.185	0.184	0.285	0.161	0.230	0.279
CT2	0.323	0.300	**0.709**	0.180	0.497	-0.042	0.333	0.242	0.264	0.149	0.498	0.497	0.158	0.201	0.330	0.332	0.147	0.424	0.311
CT3	0.452	0.368	**0.804**	0.282	0.490	-0.069	0.244	0.331	0.366	0.182	0.567	0.515	0.150	0.223	0.354	0.451	0.120	0.508	0.423
CT4	0.392	0.336	**0.801**	0.244	0.435	-0.044	0.291	0.275	0.383	0.108	0.560	0.469	0.124	0.214	0.363	0.403	0.157	0.511	0.424
CT5	0.402	0.391	**0.772**	0.280	0.477	-0.080	0.352	0.289	0.370	0.166	0.556	0.443	0.157	0.155	0.356	0.400	0.147	0.521	0.402
EGO1	0.511	0.403	0.207	**0.850**	0.349	-0.182	0.231	0.381	0.503	0.313	0.370	0.370	0.402	0.402	0.269	0.387	0.220	0.318	0.470
EGO2	0.407	0.366	0.205	**0.805**	0.309	-0.221	0.206	0.344	0.441	0.268	0.345	0.337	0.359	0.356	0.244	0.346	0.266	0.285	0.357
EGO3	0.450	0.433	0.272	**0.810**	0.316	-0.139	0.265	0.335	0.413	0.354	0.329	0.398	0.475	0.397	0.263	0.340	0.206	0.327	0.482
EGO4	0.487	0.441	0.352	**0.809**	0.405	-0.088	0.320	0.327	0.467	0.283	0.413	0.435	0.341	0.327	0.341	0.410	0.214	0.398	0.541
ELB1	0.420	0.361	0.387	0.269	**0.710**	0.006	0.375	0.379	0.403	0.215	0.417	0.531	0.216	0.225	0.331	0.467	0.021	0.436	0.465
ELB2	0.519	0.445	0.466	0.377	**0.771**	-0.026	0.316	0.368	0.517	0.338	0.522	0.464	0.240	0.252	0.306	0.507	0.133	0.525	0.530
ELB3	0.497	0.400	0.474	0.362	**0.818**	-0.056	0.345	0.451	0.532	0.240	0.524	0.493	0.207	0.320	0.322	0.519	0.131	0.478	0.527
ELB4	0.445	0.427	0.493	0.319	**0.761**	-0.062	0.407	0.394	0.412	0.155	0.519	0.633	0.278	0.293	0.429	0.579	0.087	0.542	0.470

ELB5	0.479	0.416	0.481	0.304	**0.814**	-0.035	0.437	0.421	0.472	0.258	0.483	0.518	0.360	0.368	0.393	0.564	0.129	0.485	0.447
ELB6	0.538	0.438	0.529	0.339	**0.766**	-0.044	0.276	0.402	0.472	0.245	0.581	0.517	0.251	0.327	0.304	0.544	0.099	0.480	0.468
ER1	0.027	0.005	-0.076	-0.183	-0.048	**0.902**	-0.079	-0.027	-0.051	-0.162	-0.083	-0.116	-0.153	-0.086	-0.203	-0.134	-0.371	-0.119	0.018
ER3	0.022	0.079	-0.062	-0.153	-0.037	**0.895**	-0.103	-0.006	-0.035	-0.119	-0.063	0.006	-0.054	-0.085	-0.209	-0.092	-0.343	-0.142	0.026
HS2	0.203	0.166	0.313	0.117	0.273	-0.082	**0.597**	0.217	0.133	-0.031	0.268	0.374	0.091	0.094	0.476	0.311	0.075	0.348	0.193
HS3	0.331	0.294	0.322	0.302	0.416	-0.102	**0.874**	0.172	0.353	0.174	0.347	0.411	0.314	0.232	0.506	0.378	0.149	0.455	0.351
HS4	0.345	0.244	0.322	0.286	0.392	-0.063	**0.871**	0.210	0.312	0.159	0.351	0.434	0.292	0.263	0.400	0.407	0.143	0.399	0.347
IGO1	0.375	0.301	0.286	0.254	0.414	0.008	0.218	**0.757**	0.364	0.186	0.254	0.389	0.226	0.157	0.224	0.359	0.081	0.263	0.437
IGO2	0.427	0.307	0.303	0.282	0.421	-0.011	0.134	**0.804**	0.456	0.166	0.305	0.345	0.091	0.149	0.214	0.369	0.089	0.245	0.433
IGO3	0.500	0.380	0.302	0.469	0.427	-0.001	0.180	**0.787**	0.524	0.281	0.339	0.321	0.168	0.151	0.272	0.404	0.126	0.275	0.573
IGO4	0.302	0.233	0.183	0.220	0.246	-0.065	0.177	**0.579**	0.271	0.192	0.252	0.212	0.128	0.159	0.194	0.276	0.140	0.224	0.343
MAP1	0.571	0.433	0.399	0.393	0.466	-0.023	0.278	0.449	**0.846**	0.236	0.344	0.348	0.246	0.261	0.355	0.460	0.236	0.421	0.537
MAP2	0.657	0.528	0.415	0.526	0.581	-0.046	0.357	0.494	**0.888**	0.324	0.495	0.467	0.366	0.317	0.374	0.511	0.241	0.490	0.634
MAP3	0.287	0.185	0.196	0.371	0.329	-0.047	0.165	0.343	**0.547**	0.375	0.258	0.280	0.187	0.260	0.202	0.337	0.147	0.220	0.328
MAV1	0.233	0.235	0.142	0.290	0.236	-0.136	0.100	0.197	0.293	**0.857**	0.206	0.201	0.270	0.225	0.098	0.227	0.146	0.173	0.279
MAV2	0.237	0.251	0.156	0.272	0.229	-0.140	0.127	0.176	0.282	**0.875**	0.205	0.198	0.302	0.183	0.095	0.261	0.183	0.177	0.277
MAV3	0.358	0.317	0.191	0.368	0.320	-0.125	0.162	0.319	0.385	**0.815**	0.270	0.241	0.427	0.238	0.151	0.312	0.181	0.141	0.357
MSR10	0.439	0.386	0.499	0.359	0.450	0.008	0.350	0.286	0.356	0.259	**0.726**	0.470	0.289	0.283	0.279	0.394	0.064	0.515	0.447
MSR11	0.401	0.353	0.585	0.289	0.478	-0.092	0.360	0.286	0.372	0.240	**0.711**	0.573	0.206	0.235	0.466	0.426	0.161	0.651	0.438
MSR3	0.482	0.408	0.585	0.346	0.515	0.009	0.326	0.285	0.376	0.204	**0.742**	0.478	0.198	0.230	0.375	0.385	0.106	0.566	0.442
MSR4	0.362	0.330	0.534	0.303	0.459	-0.132	0.238	0.208	0.289	0.160	**0.726**	0.477	0.164	0.204	0.334	0.361	0.141	0.502	0.378
MSR5	0.435	0.313	0.475	0.301	0.486	-0.102	0.292	0.311	0.362	0.155	**0.748**	0.458	0.154	0.206	0.311	0.366	0.099	0.468	0.394
MSR6	0.447	0.395	0.502	0.306	0.544	-0.014	0.275	0.314	0.381	0.191	**0.777**	0.482	0.179	0.241	0.370	0.381	0.039	0.537	0.451
MSR7	0.370	0.322	0.423	0.388	0.417	-0.123	0.218	0.301	0.350	0.169	**0.674**	0.389	0.194	0.230	0.317	0.364	0.115	0.457	0.363
ORG1	0.399	0.345	0.459	0.292	0.581	-0.106	0.363	0.361	0.316	0.276	0.494	**0.716**	0.351	0.288	0.364	0.536	0.129	0.431	0.404
ORG2	0.497	0.422	0.497	0.530	0.532	-0.007	0.395	0.366	0.509	0.260	0.576	**0.796**	0.357	0.362	0.338	0.499	0.178	0.520	0.581
ORG3	0.292	0.204	0.444	0.182	0.449	-0.092	0.331	0.279	0.234	0.129	0.429	**0.722**	0.251	0.149	0.371	0.424	0.125	0.401	0.285

ORG4	0.376	0.299	0.484	0.343	0.483	-0.008	0.440	0.302	0.329	0.069	0.452	**0.809**	0.278	0.299	0.429	0.511	0.087	0.453	0.366
PAP1	0.343	0.317	0.119	0.442	0.301	-0.075	0.311	0.247	0.354	0.462	0.262	0.366	**0.871**	0.518	0.146	0.367	0.251	0.226	0.292
PAP2	0.326	0.282	0.158	0.462	0.282	-0.097	0.280	0.153	0.321	0.329	0.230	0.384	**0.899**	0.599	0.123	0.336	0.244	0.247	0.226
PAP3	0.267	0.213	0.220	0.360	0.298	-0.133	0.251	0.151	0.263	0.268	0.226	0.343	**0.865**	0.564	0.157	0.342	0.260	0.306	0.230
PAV1	0.394	0.310	0.268	0.433	0.367	-0.081	0.259	0.188	0.372	0.223	0.328	0.366	0.576	**0.916**	0.158	0.389	0.219	0.359	0.293
PAV2	0.304	0.264	0.235	0.406	0.364	-0.103	0.295	0.184	0.307	0.202	0.268	0.383	0.580	**0.909**	0.174	0.356	0.235	0.319	0.232
PAV3	0.296	0.234	0.169	0.360	0.294	-0.069	0.133	0.183	0.266	0.277	0.255	0.246	0.555	**0.853**	0.092	0.302	0.244	0.272	0.181
PL1	0.310	0.227	0.381	0.232	0.307	-0.168	0.413	0.194	0.271	0.140	0.444	0.314	0.080	0.115	**0.750**	0.266	0.052	0.462	0.280
PL2	0.360	0.252	0.385	0.356	0.399	-0.183	0.488	0.300	0.409	0.169	0.387	0.459	0.178	0.169	**0.869**	0.471	0.175	0.482	0.341
PL3	0.253	0.161	0.353	0.238	0.383	-0.215	0.466	0.246	0.309	0.019	0.364	0.400	0.122	0.104	**0.829**	0.417	0.121	0.440	0.226
RH1	0.378	0.264	0.388	0.330	0.532	-0.122	0.406	0.326	0.359	0.177	0.389	0.588	0.343	0.320	0.407	**0.816**	0.189	0.439	0.320
RH2	0.486	0.374	0.421	0.407	0.553	-0.132	0.387	0.417	0.535	0.320	0.447	0.499	0.328	0.345	0.421	**0.836**	0.163	0.523	0.453
RH3	0.480	0.389	0.434	0.420	0.564	-0.059	0.316	0.438	0.539	0.296	0.451	0.504	0.284	0.332	0.350	**0.836**	0.181	0.474	0.516
RH4	0.398	0.340	0.447	0.321	0.595	-0.106	0.410	0.381	0.404	0.230	0.424	0.558	0.356	0.292	0.409	**0.787**	0.134	0.490	0.430
TA2	0.285	0.229	0.238	0.272	0.203	-0.120	0.171	0.157	0.287	0.185	0.246	0.208	0.143	0.262	0.138	0.138	**0.658**	0.194	0.178
TA4	-0.008	0.063	0.041	0.170	0.063	-0.402	0.142	0.075	0.111	0.135	-0.016	0.115	0.310	0.165	0.085	0.169	**0.786**	0.063	-0.002
TA5	0.036	0.071	0.123	0.168	0.019	-0.385	0.043	0.085	0.209	0.128	0.070	0.062	0.195	0.144	0.111	0.149	**0.805**	0.078	0.034
TSEM1	0.438	0.377	0.459	0.386	0.464	-0.086	0.396	0.292	0.435	0.181	0.576	0.509	0.262	0.349	0.493	0.500	0.132	**0.768**	0.464
TSEM2	0.425	0.308	0.543	0.269	0.482	-0.076	0.361	0.292	0.393	0.135	0.606	0.443	0.177	0.264	0.476	0.454	0.070	**0.791**	0.422
TSEM4	0.258	0.242	0.363	0.225	0.350	-0.199	0.217	0.107	0.199	0.074	0.429	0.357	0.161	0.211	0.290	0.349	0.082	**0.631**	0.236
TSEM5	0.303	0.287	0.514	0.258	0.490	-0.126	0.438	0.247	0.300	0.074	0.501	0.503	0.266	0.270	0.437	0.441	0.188	**0.666**	0.272
TSEM6	0.387	0.295	0.389	0.293	0.463	-0.076	0.357	0.234	0.420	0.181	0.448	0.321	0.183	0.162	0.275	0.338	0.081	**0.689**	0.415
TVO1	0.545	0.469	0.316	0.472	0.434	0.065	0.317	0.390	0.458	0.243	0.395	0.396	0.184	0.140	0.260	0.331	0.083	0.328	**0.732**
TVO2	0.541	0.431	0.372	0.474	0.470	0.013	0.311	0.480	0.534	0.281	0.445	0.428	0.275	0.243	0.251	0.380	0.152	0.427	**0.777**
TVO3	0.533	0.482	0.421	0.360	0.428	0.018	0.270	0.454	0.502	0.265	0.401	0.419	0.193	0.195	0.304	0.442	0.079	0.384	**0.752**
TVO4	0.588	0.525	0.389	0.472	0.481	-0.071	0.300	0.563	0.556	0.301	0.418	0.418	0.223	0.200	0.304	0.451	0.111	0.431	**0.797**
TVO5	0.520	0.496	0.360	0.352	0.424	0.070	0.210	0.447	0.400	0.246	0.410	0.381	0.137	0.153	0.206	0.359	-0.076	0.366	**0.738**
TVO6	0.680	0.589	0.473	0.501	0.623	0.030	0.371	0.493	0.601	0.333	0.555	0.541	0.280	0.284	0.287	0.478	0.086	0.478	**0.824**

APPENDIX O

Cross Loadings for Lower Order Constructs (SRL AND AE) Validation

	AE	BE	CE	CT	EE	ELB	ER	HS	MSR	ORG	PL	RH	TSEM
AE1	**0.830**	0.257	0.362	0.223	0.271	0.108	-0.185	0.250	0.155	0.175	0.274	0.102	0.231
AE2	**0.875**	0.075	0.197	0.148	0.221	0.014	-0.312	0.131	0.062	0.080	0.188	0.074	0.130
AE3	**0.914**	0.069	0.195	0.193	0.242	0.013	-0.289	0.152	0.046	0.125	0.197	0.117	0.129
AE4	**0.903**	0.223	0.239	0.234	0.291	0.093	-0.175	0.237	0.137	0.212	0.235	0.152	0.221
AE5	**0.892**	0.176	0.213	0.212	0.243	0.077	-0.224	0.183	0.096	0.170	0.206	0.169	0.206
BE1	0.124	**0.888**	0.483	0.336	0.492	0.407	0.032	0.445	0.342	0.509	0.337	0.445	0.456
BE2	0.099	**0.894**	0.461	0.315	0.464	0.345	0.059	0.450	0.298	0.444	0.254	0.358	0.395
BE3	0.155	**0.863**	0.505	0.344	0.467	0.391	0.065	0.395	0.363	0.445	0.282	0.314	0.403
BE4	0.356	**0.633**	0.320	0.302	0.306	0.214	0.017	0.327	0.239	0.325	0.248	0.179	0.289
BE5	0.054	**0.765**	0.518	0.381	0.514	0.384	0.113	0.415	0.361	0.441	0.287	0.301	0.394
CE1	0.172	0.523	**0.814**	0.430	0.634	0.477	-0.003	0.410	0.454	0.482	0.351	0.345	0.449
CE2	0.377	0.262	**0.614**	0.259	0.372	0.217	-0.061	0.310	0.185	0.273	0.303	0.221	0.234
CE3	0.098	0.494	**0.803**	0.348	0.483	0.431	0.040	0.359	0.364	0.392	0.228	0.284	0.395
CE4	0.244	0.416	**0.810**	0.406	0.447	0.377	0.058	0.391	0.333	0.367	0.325	0.265	0.371
CE5	0.224	0.445	**0.794**	0.441	0.493	0.366	0.023	0.366	0.409	0.419	0.284	0.221	0.339
CT2	0.197	0.375	0.465	**0.781**	0.382	0.509	-0.037	0.344	0.499	0.510	0.335	0.348	0.450
CT3	0.218	0.266	0.335	**0.777**	0.281	0.486	-0.064	0.266	0.571	0.515	0.354	0.442	0.519
CT4	0.134	0.288	0.357	**0.771**	0.271	0.427	-0.048	0.299	0.567	0.457	0.363	0.394	0.504
CT5	0.148	0.321	0.350	**0.754**	0.309	0.467	-0.078	0.347	0.566	0.430	0.361	0.394	0.525
EE2	0.249	0.524	0.583	0.435	**0.877**	0.413	0.050	0.399	0.364	0.469	0.359	0.380	0.440
EE3	0.253	0.468	0.467	0.274	**0.828**	0.295	0.032	0.392	0.275	0.343	0.300	0.345	0.339

EE4	0.252	0.486	0.601	0.354	**0.883**	0.356	0.027	0.381	0.288	0.458	0.306	0.365	0.369
EE5	0.215	0.396	0.496	0.304	**0.794**	0.286	0.004	0.303	0.244	0.325	0.252	0.303	0.343
ELB1	0.048	0.349	0.404	0.404	0.309	**0.737**	0.002	0.375	0.422	0.540	0.329	0.479	0.443
ELB2	0.033	0.250	0.374	0.469	0.251	**0.745**	-0.027	0.303	0.522	0.446	0.305	0.496	0.519
ELB3	-0.011	0.253	0.305	0.470	0.213	**0.786**	-0.057	0.330	0.519	0.475	0.321	0.503	0.473
ELB4	0.126	0.402	0.441	0.505	0.419	**0.798**	-0.050	0.413	0.518	0.637	0.424	0.593	0.557
ELB5	0.054	0.423	0.431	0.492	0.351	**0.826**	-0.036	0.424	0.482	0.518	0.386	0.566	0.489
ELB6	0.020	0.266	0.294	0.524	0.260	**0.736**	-0.040	0.270	0.577	0.506	0.301	0.536	0.476
ER1	-0.186	0.039	0.001	-0.076	0.011	-0.049	**0.846**	-0.082	-0.085	-0.126	-0.200	-0.145	-0.128
ER3	-0.281	0.082	0.030	-0.058	0.045	-0.034	**0.941**	-0.105	-0.063	0.004	-0.211	-0.088	-0.146
HS2	0.412	0.304	0.358	0.318	0.392	0.289	-0.083	**0.736**	0.280	0.396	0.476	0.337	0.377
HS3	0.026	0.421	0.394	0.327	0.325	0.427	-0.105	**0.813**	0.350	0.404	0.499	0.380	0.451
HS4	0.060	0.472	0.384	0.332	0.323	0.399	-0.065	**0.830**	0.358	0.425	0.402	0.412	0.399
MSR10	0.006	0.378	0.332	0.489	0.260	0.440	0.016	0.331	**0.738**	0.442	0.285	0.382	0.509
MSR11	0.161	0.390	0.433	0.575	0.371	0.479	-0.088	0.377	**0.758**	0.562	0.475	0.426	0.651
MSR3	0.036	0.300	0.347	0.581	0.237	0.509	0.016	0.317	**0.739**	0.465	0.381	0.379	0.563
MSR4	0.098	0.208	0.308	0.539	0.219	0.451	-0.130	0.238	**0.715**	0.467	0.333	0.358	0.496
MSR5	0.112	0.247	0.337	0.477	0.241	0.479	-0.102	0.308	**0.737**	0.453	0.317	0.362	0.477
MSR6	0.048	0.252	0.303	0.495	0.225	0.540	-0.021	0.270	**0.757**	0.477	0.377	0.371	0.530
MSR7	0.080	0.152	0.269	0.425	0.160	0.409	-0.119	0.214	**0.640**	0.376	0.320	0.358	0.465
ORG1	0.137	0.378	0.449	0.471	0.390	0.597	-0.095	0.389	0.500	**0.739**	0.358	0.555	0.440
ORG2	0.023	0.451	0.338	0.486	0.341	0.526	0.001	0.370	0.584	**0.727**	0.333	0.488	0.511
ORG3	0.249	0.317	0.352	0.454	0.347	0.465	-0.071	0.355	0.439	**0.763**	0.367	0.445	0.429
ORG4	0.123	0.487	0.413	0.493	0.382	0.501	0.006	0.454	0.457	**0.829**	0.421	0.525	0.465
PL1	0.240	0.280	0.303	0.382	0.310	0.312	-0.175	0.429	0.454	0.316	**0.796**	0.265	0.471

PL2	0.171	0.324	0.348	0.378	0.312	0.411	-0.182	0.493	0.394	0.459	**0.838**	0.470	0.478
PL3	0.199	0.240	0.287	0.358	0.266	0.393	-0.208	0.502	0.367	0.415	**0.822**	0.431	0.451
RH1	0.186	0.392	0.318	0.390	0.391	0.542	-0.108	0.428	0.394	0.596	0.396	**0.858**	0.451
RH2	0.118	0.319	0.193	0.406	0.321	0.549	-0.129	0.391	0.450	0.491	0.414	**0.814**	0.516
RH3	-0.013	0.303	0.251	0.417	0.242	0.553	-0.062	0.292	0.450	0.484	0.338	**0.793**	0.465
RH4	0.127	0.290	0.358	0.453	0.371	0.615	-0.096	0.418	0.427	0.568	0.399	**0.807**	0.505
TSEM1	0.097	0.357	0.347	0.449	0.338	0.467	-0.089	0.378	0.585	0.493	0.489	0.486	**0.725**
TSEM2	0.208	0.401	0.305	0.533	0.355	0.480	-0.076	0.381	0.620	0.440	0.487	0.452	**0.782**
TSEM4	0.251	0.168	0.230	0.352	0.281	0.350	-0.204	0.239	0.427	0.351	0.295	0.347	**0.658**
TSEM5	0.218	0.382	0.450	0.532	0.372	0.506	-0.123	0.463	0.508	0.513	0.439	0.455	**0.740**
TSEM6	-0.073	0.364	0.311	0.379	0.200	0.452	-0.080	0.325	0.452	0.297	0.270	0.325	**0.649**

APPENDIX P

Cross Loadings for HOCs (SRL and AEG)

	Academic Engagement	Self-Regulated Learning
AE	**0.419**	0.221
BE	**0.816**	0.564
CE	**0.864**	0.585
EE	**0.849**	0.528
CT	0.524	**0.790**
ELB	0.507	**0.825**
HS	0.558	**0.701**
MSR	0.469	**0.818**
ORG	0.592	**0.836**
PL	0.442	**0.707**
RH	0.451	**0.774**
TSEM	0.549	**0.842**

APPENDIX Q

Cross Loadings for Final Model (Without Moderators)

	ASE	AEG	CLB	EGO	IGO	MAP	MAV	PAP	PAV	SRL	TA	TVO
AE	-0.028	**0.416**	-0.032	0.009	-0.051	-0.075	-0.112	0.037	0.038	0.213	0.042	-0.081
BE	0.321	**0.817**	0.300	0.222	0.272	0.331	0.172	0.363	0.292	0.558	0.059	0.364
CE	0.308	**0.865**	0.319	0.191	0.262	0.302	0.121	0.229	0.176	0.581	0.122	0.348
EE	0.310	**0.849**	0.285	0.228	0.235	0.293	0.100	0.269	0.207	0.523	0.090	0.340
ASE1	**0.796**	0.225	0.573	0.523	0.455	0.558	0.295	0.365	0.337	0.500	0.164	0.607
ASE2	**0.590**	0.233	0.483	0.359	0.328	0.355	0.226	0.259	0.171	0.383	0.131	0.428
ASE3	**0.724**	0.335	0.523	0.397	0.377	0.478	0.214	0.281	0.392	0.526	0.073	0.572
ASE5	**0.776**	0.222	0.433	0.444	0.418	0.516	0.280	0.284	0.280	0.472	0.167	0.563
ASE6	**0.825**	0.249	0.504	0.481	0.492	0.601	0.239	0.262	0.295	0.494	0.214	0.616
ASE7	**0.804**	0.317	0.557	0.394	0.461	0.581	0.251	0.183	0.202	0.497	0.179	0.610
ASE8	**0.723**	0.225	0.376	0.389	0.345	0.472	0.253	0.230	0.257	0.465	0.190	0.479
CLB1	0.566	0.281	**0.782**	0.423	0.380	0.517	0.284	0.245	0.269	0.444	0.191	0.609
CLB2	0.436	0.194	**0.741**	0.357	0.254	0.297	0.265	0.168	0.236	0.360	0.121	0.467
CLB3	0.527	0.179	**0.774**	0.364	0.318	0.422	0.246	0.167	0.186	0.388	0.146	0.484
CLB4	0.351	0.317	**0.590**	0.312	0.242	0.240	0.110	0.339	0.186	0.326	0.129	0.280
CT	0.502	0.524	0.448	0.315	0.365	0.441	0.196	0.193	0.257	**0.792**	0.223	0.498
EGO1	0.510	0.139	0.402	**0.846**	0.380	0.503	0.313	0.402	0.402	0.384	0.246	0.470
EGO2	0.407	0.129	0.366	**0.801**	0.343	0.441	0.269	0.358	0.356	0.351	0.266	0.356
EGO3	0.450	0.238	0.434	**0.811**	0.334	0.413	0.354	0.475	0.397	0.384	0.223	0.481
EGO4	0.487	0.255	0.442	**0.815**	0.326	0.467	0.283	0.340	0.327	0.476	0.242	0.541
ELB	0.616	0.508	0.533	0.419	0.518	0.595	0.305	0.342	0.385	**0.837**	0.164	0.620
HS	0.368	0.558	0.296	0.296	0.253	0.333	0.125	0.290	0.248	**0.680**	0.171	0.372

IGO1	0.375	0.298	0.301	0.253	**0.763**	0.364	0.186	0.226	0.158	0.392	0.068	0.438
IGO2	0.427	0.188	0.308	0.282	**0.804**	0.455	0.166	0.091	0.148	0.376	0.108	0.434
IGO3	0.500	0.190	0.378	0.468	**0.781**	0.523	0.282	0.168	0.151	0.390	0.160	0.573
IGO4	0.302	0.129	0.233	0.220	**0.579**	0.271	0.192	0.127	0.159	0.275	0.149	0.343
MAP1	0.571	0.247	0.432	0.393	0.448	**0.847**	0.236	0.246	0.261	0.475	0.245	0.537
MAP2	0.657	0.358	0.527	0.526	0.492	**0.889**	0.324	0.365	0.316	0.571	0.273	0.634
MAP3	0.287	0.122	0.181	0.371	0.342	**0.543**	0.375	0.186	0.261	0.304	0.173	0.327
MAV1	0.233	0.076	0.234	0.290	0.196	0.292	**0.856**	0.269	0.225	0.213	0.141	0.279
MAV2	0.237	0.108	0.250	0.272	0.176	0.281	**0.874**	0.301	0.182	0.223	0.182	0.277
MAV3	0.358	0.140	0.315	0.368	0.318	0.383	**0.817**	0.426	0.238	0.275	0.210	0.357
MSR	0.576	0.469	0.490	0.443	0.388	0.488	0.277	0.274	0.320	**0.826**	0.196	0.575
ORG	0.511	0.592	0.418	0.441	0.428	0.452	0.237	0.404	0.363	**0.836**	0.191	0.533
PAP1	0.343	0.285	0.321	0.442	0.248	0.353	0.462	**0.869**	0.519	0.333	0.240	0.292
PAP2	0.325	0.281	0.284	0.461	0.153	0.321	0.330	**0.898**	0.598	0.325	0.231	0.226
PAP3	0.267	0.289	0.217	0.359	0.152	0.264	0.268	**0.868**	0.564	0.344	0.212	0.230
PAV1	0.394	0.236	0.310	0.433	0.188	0.372	0.223	0.576	**0.916**	0.391	0.250	0.293
PAV2	0.303	0.309	0.265	0.405	0.185	0.307	0.202	0.580	**0.912**	0.388	0.259	0.232
PAV3	0.295	0.108	0.234	0.359	0.183	0.266	0.277	0.555	**0.850**	0.275	0.250	0.182
PL	0.380	0.442	0.264	0.341	0.302	0.405	0.139	0.156	0.161	**0.694**	0.152	0.349
RH	0.522	0.452	0.409	0.443	0.468	0.545	0.302	0.403	0.391	**0.784**	0.193	0.511
TA2	0.286	0.137	0.227	0.272	0.155	0.287	0.186	0.143	0.262	0.239	**0.844**	0.177
TA4	-0.008	0.051	0.068	0.170	0.076	0.111	0.135	0.310	0.166	0.108	**0.634**	-0.002
TA5	0.036	-0.025	0.073	0.168	0.085	0.209	0.127	0.195	0.143	0.098	**0.659**	0.034
TSEM	0.508	0.549	0.424	0.402	0.338	0.492	0.178	0.301	0.360	**0.842**	0.188	0.506
TVO1	0.544	0.245	0.467	0.474	0.389	0.458	0.244	0.184	0.141	0.426	0.115	**0.730**
TVO2	0.540	0.265	0.428	0.475	0.479	0.534	0.282	0.275	0.243	0.479	0.187	**0.776**
TVO3	0.533	0.307	0.480	0.361	0.453	0.502	0.265	0.194	0.195	0.480	0.085	**0.753**
TVO4	0.588	0.320	0.525	0.473	0.562	0.556	0.301	0.222	0.200	0.497	0.111	**0.797**
TVO5	0.520	0.272	0.494	0.353	0.447	0.401	0.246	0.137	0.154	0.431	-0.040	**0.739**
TVO6	0.679	0.335	0.586	0.502	0.492	0.601	0.334	0.280	0.284	0.598	0.147	**0.824**

APPENDIX R

Cross Loadings for Final Model (With Moderators)

	ASE	AEG	CLB	EGO	Gender	IGO	LAS	MAP	MAV	PAP	PAV	SRL	TA	TVO	Gender x SRL	LAS x SRL
AE	-0.028	**0.464**	-0.032	0.009	0.124	-0.051	0.364	-0.075	-0.112	0.037	0.038	0.213	0.042	-0.081	0.216	-0.056
BE	0.321	**0.807**	0.300	0.222	0.016	0.272	0.461	0.331	0.172	0.363	0.292	0.558	0.059	0.364	0.466	-0.408
CE	0.308	**0.851**	0.319	0.191	0.020	0.262	0.400	0.302	0.121	0.229	0.176	0.581	0.122	0.348	0.459	-0.310
EE	0.310	**0.850**	0.285	0.228	0.022	0.235	0.480	0.293	0.100	0.269	0.207	0.523	0.090	0.340	0.451	-0.289
ASE1	**0.796**	0.216	0.573	0.523	-0.062	0.455	0.193	0.558	0.295	0.365	0.337	0.500	0.163	0.607	0.423	-0.115
ASE2	**0.590**	0.236	0.483	0.359	0.004	0.328	0.196	0.355	0.226	0.259	0.171	0.383	0.131	0.428	0.276	-0.112
ASE3	**0.724**	0.322	0.523	0.397	-0.032	0.377	0.212	0.478	0.214	0.281	0.392	0.525	0.073	0.572	0.419	-0.229
ASE5	**0.776**	0.213	0.433	0.444	0.025	0.418	0.129	0.516	0.280	0.284	0.280	0.472	0.167	0.563	0.383	-0.070
ASE6	**0.825**	0.237	0.504	0.481	0.010	0.492	0.142	0.601	0.239	0.262	0.295	0.494	0.214	0.616	0.394	-0.107
ASE7	**0.804**	0.305	0.557	0.394	-0.047	0.461	0.131	0.581	0.251	0.183	0.202	0.496	0.179	0.610	0.395	-0.102
ASE8	**0.723**	0.224	0.376	0.389	-0.018	0.345	0.167	0.472	0.253	0.230	0.257	0.465	0.190	0.479	0.333	-0.046
CLB1	0.566	0.266	**0.782**	0.423	0.003	0.380	0.151	0.517	0.284	0.245	0.269	0.443	0.191	0.609	0.308	-0.098
CLB2	0.436	0.185	**0.741**	0.357	-0.019	0.254	0.047	0.297	0.265	0.168	0.236	0.360	0.121	0.467	0.279	-0.033
CLB3	0.527	0.169	**0.774**	0.364	-0.081	0.318	0.062	0.422	0.246	0.167	0.186	0.388	0.145	0.484	0.264	-0.002
CLB4	0.351	0.321	**0.590**	0.312	-0.072	0.242	0.251	0.240	0.110	0.339	0.186	0.326	0.129	0.280	0.225	-0.149
CT	0.502	0.522	0.448	0.315	0.107	0.365	0.287	0.441	0.196	0.193	0.257	**0.792**	0.223	0.498	0.677	-0.193
EGO1	0.510	0.133	0.402	**0.846**	-0.061	0.380	0.082	0.503	0.313	0.402	0.402	0.384	0.246	0.470	0.237	-0.063
EGO2	0.407	0.129	0.366	**0.801**	-0.033	0.343	0.096	0.441	0.269	0.358	0.356	0.351	0.266	0.356	0.209	-0.078
EGO3	0.450	0.234	0.434	**0.811**	-0.055	0.334	0.156	0.413	0.354	0.475	0.397	0.384	0.223	0.481	0.276	-0.085
EGO4	0.487	0.250	0.442	**0.815**	-0.012	0.326	0.160	0.467	0.283	0.340	0.327	0.476	0.242	0.541	0.359	-0.054
ELB	0.616	0.497	0.533	0.419	0.009	0.518	0.338	0.595	0.305	0.342	0.385	**0.837**	0.163	0.620	0.661	-0.198

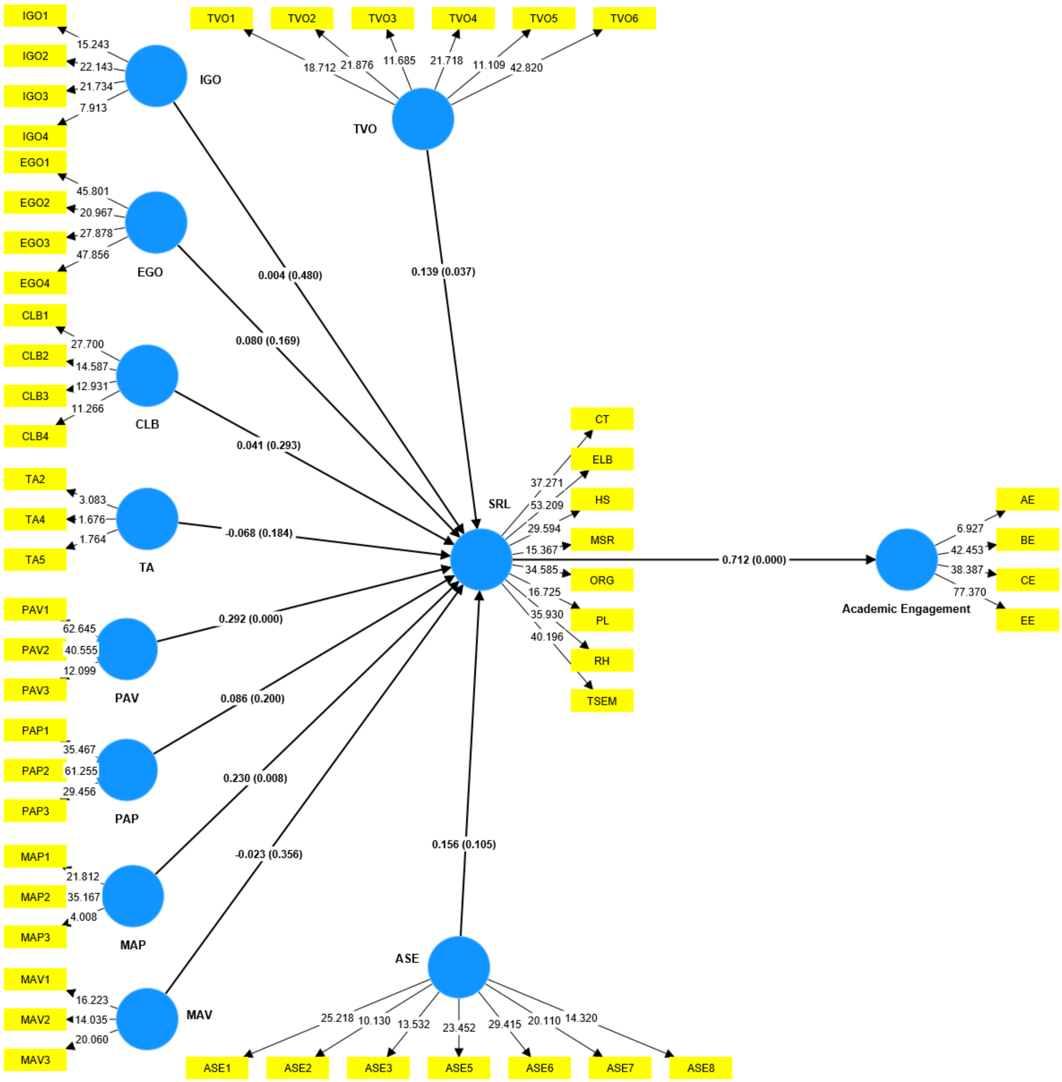
Gender_1	-0.025	0.046	-0.055	-0.048	1.000	-0.010	-0.009	-0.013	0.050	-0.091	-0.103	0.052	0.014	0.013	0.020	0.022
HS	0.368	0.556	0.296	0.296	-0.005	0.253	0.360	0.333	0.125	0.290	0.248	**0.680**	0.171	0.372	0.531	-0.199
IGO1	0.375	0.291	0.301	0.253	-0.039	**0.763**	0.247	0.364	0.186	0.226	0.158	0.392	0.068	0.438	0.302	-0.154
IGO2	0.427	0.180	0.308	0.282	-0.030	**0.804**	0.120	0.455	0.166	0.091	0.148	0.375	0.108	0.434	0.260	-0.117
IGO3	0.500	0.176	0.378	0.468	0.019	**0.781**	0.107	0.523	0.282	0.168	0.151	0.390	0.160	0.573	0.266	-0.076
IGO4	0.302	0.128	0.233	0.220	0.032	**0.579**	0.162	0.271	0.192	0.127	0.159	0.275	0.149	0.343	0.220	-0.084
LAS1	0.116	0.463	0.060	0.095	-0.036	0.118	**0.831**	0.018	0.006	0.169	0.130	0.265	0.016	0.127	0.244	-0.189
LAS2	0.170	0.462	0.091	0.143	0.033	0.203	**0.852**	0.068	0.062	0.210	0.139	0.304	0.019	0.189	0.272	-0.163
LAS3	0.117	0.468	0.071	0.036	0.031	0.145	**0.868**	0.045	0.001	0.204	0.148	0.308	-0.004	0.140	0.261	-0.203
LAS4	0.303	0.458	0.265	0.220	-0.023	0.240	**0.819**	0.276	0.141	0.258	0.220	0.398	0.007	0.286	0.349	-0.261
LAS5	0.219	0.475	0.228	0.149	-0.043	0.188	**0.801**	0.216	0.093	0.233	0.185	0.366	0.027	0.229	0.331	-0.279
MAP1	0.571	0.239	0.432	0.393	-0.032	0.448	0.106	**0.847**	0.236	0.246	0.261	0.475	0.245	0.537	0.343	-0.120
MAP2	0.657	0.346	0.527	0.526	-0.029	0.492	0.176	**0.889**	0.324	0.365	0.316	0.571	0.273	0.634	0.407	-0.161
MAP3	0.287	0.111	0.181	0.371	0.060	0.342	0.032	**0.543**	0.375	0.186	0.261	0.304	0.173	0.327	0.253	-0.118
MAV1	0.233	0.066	0.234	0.290	0.068	0.196	0.041	0.292	**0.856**	0.269	0.225	0.213	0.141	0.279	0.107	-0.094
MAV2	0.237	0.102	0.250	0.272	0.068	0.176	0.074	0.281	**0.874**	0.301	0.182	0.223	0.182	0.277	0.107	-0.088
MAV3	0.358	0.130	0.315	0.368	0.002	0.318	0.065	0.383	**0.817**	0.426	0.238	0.275	0.210	0.357	0.129	-0.114
MSR	0.576	0.461	0.490	0.443	0.045	0.388	0.281	0.488	0.277	0.274	0.320	**0.825**	0.196	0.575	0.657	-0.191
ORG	0.511	0.586	0.418	0.441	-0.003	0.428	0.404	0.452	0.237	0.404	0.363	**0.836**	0.191	0.533	0.699	-0.299
PAP1	0.343	0.276	0.321	0.442	-0.077	0.248	0.208	0.353	0.462	**0.869**	0.519	0.333	0.240	0.291	0.265	-0.188
PAP2	0.325	0.276	0.285	0.461	-0.082	0.153	0.217	0.321	0.330	**0.898**	0.598	0.325	0.231	0.226	0.250	-0.174
PAP3	0.267	0.290	0.217	0.359	-0.080	0.152	0.252	0.264	0.268	**0.868**	0.564	0.344	0.212	0.230	0.245	-0.180
PAV1	0.394	0.236	0.310	0.433	-0.063	0.188	0.189	0.372	0.223	0.576	**0.916**	0.391	0.250	0.293	0.304	-0.152
PAV2	0.303	0.304	0.265	0.405	-0.079	0.185	0.208	0.307	0.202	0.580	**0.912**	0.388	0.259	0.232	0.301	-0.211
PAV3	0.295	0.104	0.234	0.359	-0.153	0.183	0.116	0.266	0.277	0.555	**0.850**	0.275	0.250	0.182	0.183	-0.105
PL	0.380	0.445	0.264	0.341	0.073	0.302	0.205	0.405	0.139	0.156	0.161	**0.694**	0.152	0.349	0.540	-0.121
RH	0.522	0.449	0.409	0.443	0.026	0.468	0.296	0.545	0.302	0.403	0.391	**0.784**	0.193	0.511	0.635	-0.232

TA2	0.286	0.132	0.227	0.272	-0.021	0.155	0.032	0.287	0.186	0.143	0.262	0.239	**0.843**	0.177	0.136	-0.080
TA4	-0.008	0.054	0.068	0.170	0.097	0.076	0.040	0.111	0.135	0.310	0.166	0.108	**0.634**	-0.002	0.041	-0.068
TA5	0.036	-0.018	0.073	0.168	-0.007	0.085	-0.070	0.209	0.127	0.195	0.143	0.099	**0.660**	0.034	0.055	-0.005
TSEM	0.508	0.547	0.424	0.402	0.085	0.338	0.292	0.492	0.178	0.301	0.360	**0.842**	0.188	0.506	0.669	-0.222
TVO1	0.544	0.231	0.467	0.474	-0.001	0.389	0.156	0.458	0.244	0.184	0.141	0.426	0.115	**0.730**	0.273	-0.035
TVO2	0.540	0.252	0.428	0.475	-0.012	0.479	0.175	0.534	0.282	0.275	0.243	0.478	0.187	**0.776**	0.325	-0.121
TVO3	0.533	0.300	0.480	0.361	0.003	0.453	0.180	0.502	0.265	0.194	0.195	0.480	0.085	**0.753**	0.381	-0.169
TVO4	0.588	0.309	0.525	0.473	0.003	0.562	0.186	0.556	0.301	0.222	0.200	0.497	0.111	**0.797**	0.365	-0.083
TVO5	0.520	0.263	0.494	0.353	0.004	0.447	0.188	0.401	0.246	0.137	0.154	0.431	-0.040	**0.739**	0.307	-0.063
TVO6	0.679	0.321	0.586	0.502	0.053	0.492	0.189	0.601	0.334	0.280	0.284	0.598	0.147	**0.824**	0.447	-0.186
LAS x SRL	-0.151	-0.376	-0.094	-0.084	0.022	-0.148	-0.263	-0.172	-0.118	-0.206	-0.180	-0.266	-0.081	-0.148	-0.189	1.000
Gender x SRL	0.503	0.541	0.373	0.338	0.020	0.357	0.350	0.439	0.136	0.288	0.302	0.807	0.126	0.460	1.000	-0.189

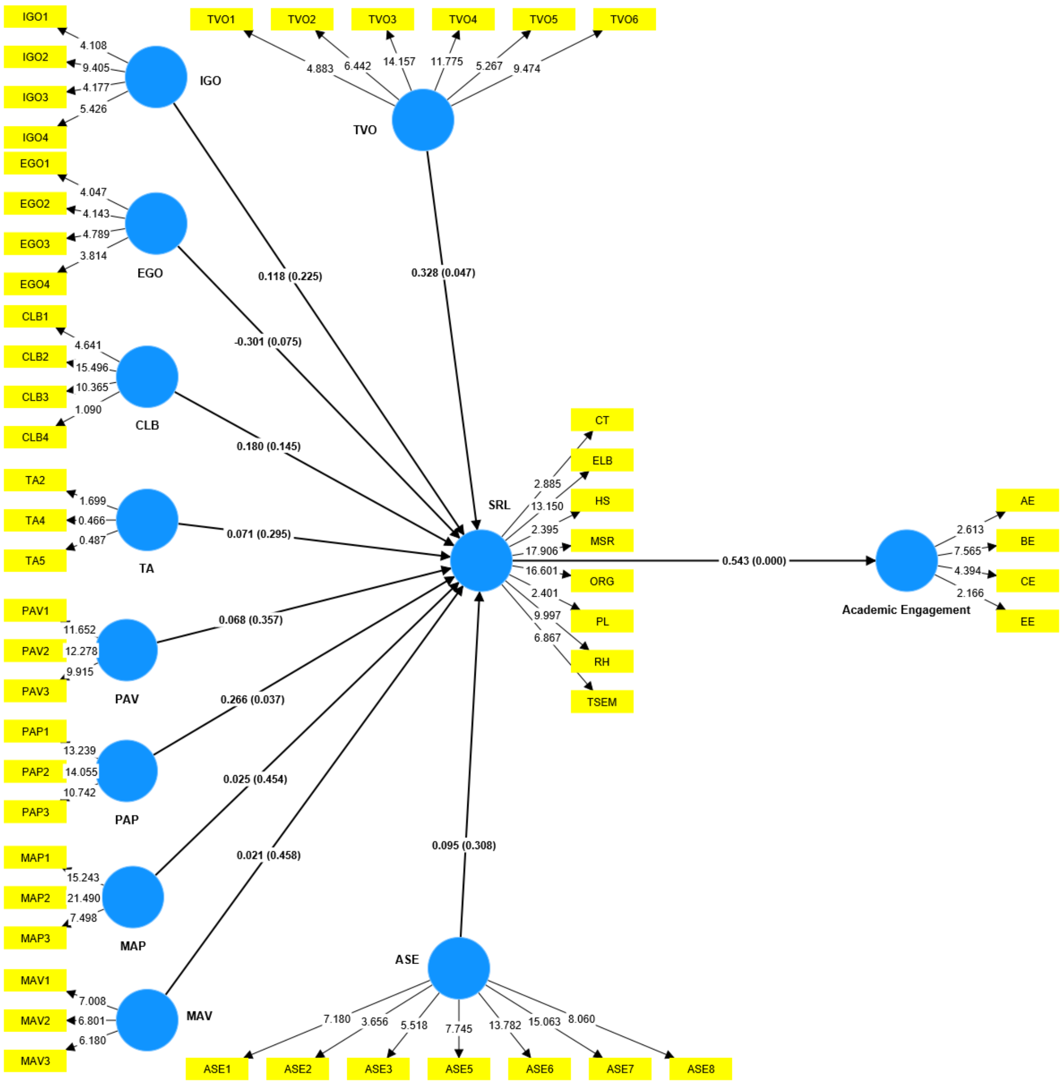
APPENDIX S

DETAILED BOOSTRAPPING RESULTS FOR THE RELATIONSHIP BETWEEN MO AND SRL BASED ON THE ACADEMIC LEVELS

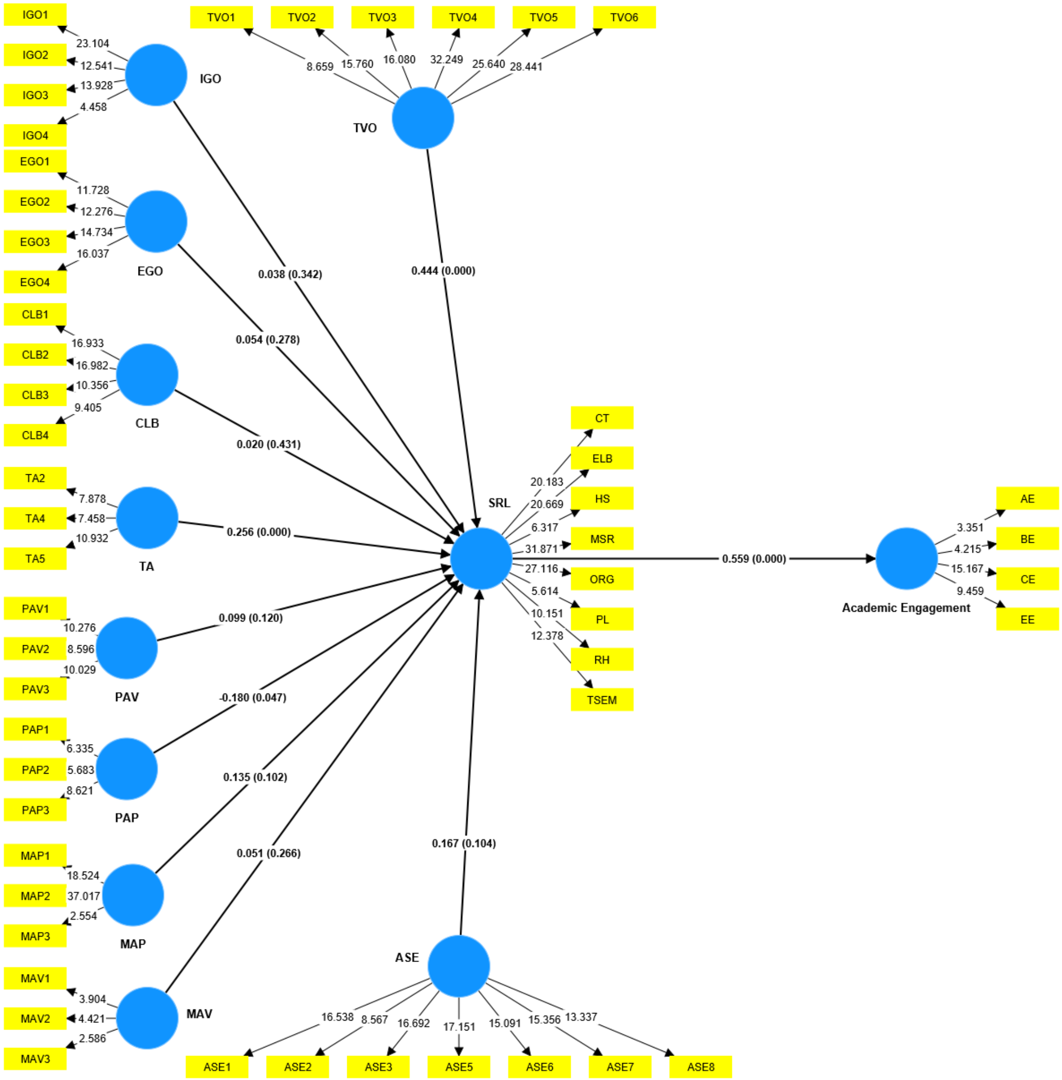
Level 100



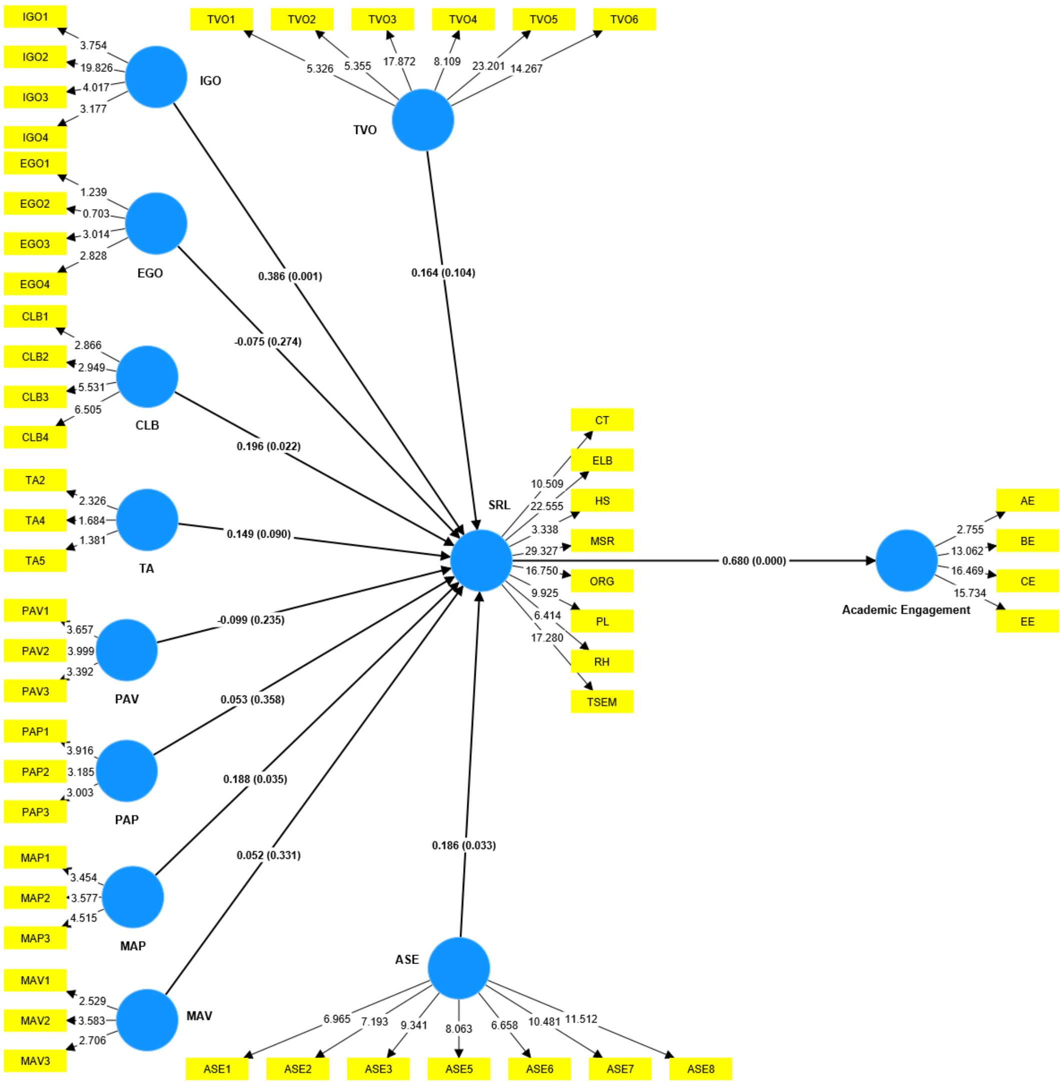
Level 200


IGO1
IGO2
IGO3
IGO4
4.108
9.405
4.177
5.426
IGO
TVO1
TVO2
TVO3
TVO4
TVO5
TVO6
4.883
6.442
14.157
11.775
5.267
9.474
TVO
EGO1
EGO2
EGO3
EGO4
4.047
4.143
4.789
3.814
EGO
0.118 (0.225)
0.328 (0.047)
-0.301 (0.075)
CLB1
CLB2
CLB3
CLB4
4.641
15.496
10.365
1.090
CLB
0.180 (0.145)
TA2
TA4
TA5
1.699
0.466
0.487
TA
0.071 (0.295)
SRL
CT
ELB
HS
MSR
ORG
PL
RH
TSEM
2.885
13.150
2.395
17.906
16.601
2.401
9.997
6.867
0.543 (0.000)
Academic Engagement
AE
BE
CE
EE
2.613
7.565
4.394
2.166
PAV1
PAV2
PAV3
11.652
12.278
9.915
PAV
0.068 (0.357)
0.266 (0.037)
PAP1
PAP2
PAP3
13.239
14.055
10.742
PAP
0.025 (0.454)
MAP1
MAP2
MAP3
15.243
21.490
7.498
MAP
0.021 (0.458)
0.095 (0.308)
MAV1
MAV2
MAV3
7.008
6.801
6.180
MAV
ASE
7.180
3.656
5.518
7.745
13.782
15.063
8.060
ASE1
ASE2
ASE3
ASE5
ASE6
ASE7
ASE8

Level 300


IGO
TVO
EGO
CLB
TA
PAV
PAP
MAP
MAV
SRL
ASE
Academic Engagement
0.038 (0.342)
0.444 (0.000)
0.054 (0.278)
0.020 (0.431)
0.256 (0.000)
0.099 (0.120)
-0.180 (0.047)
0.135 (0.102)
0.051 (0.266)
0.167 (0.104)
0.559 (0.000)

Level 400

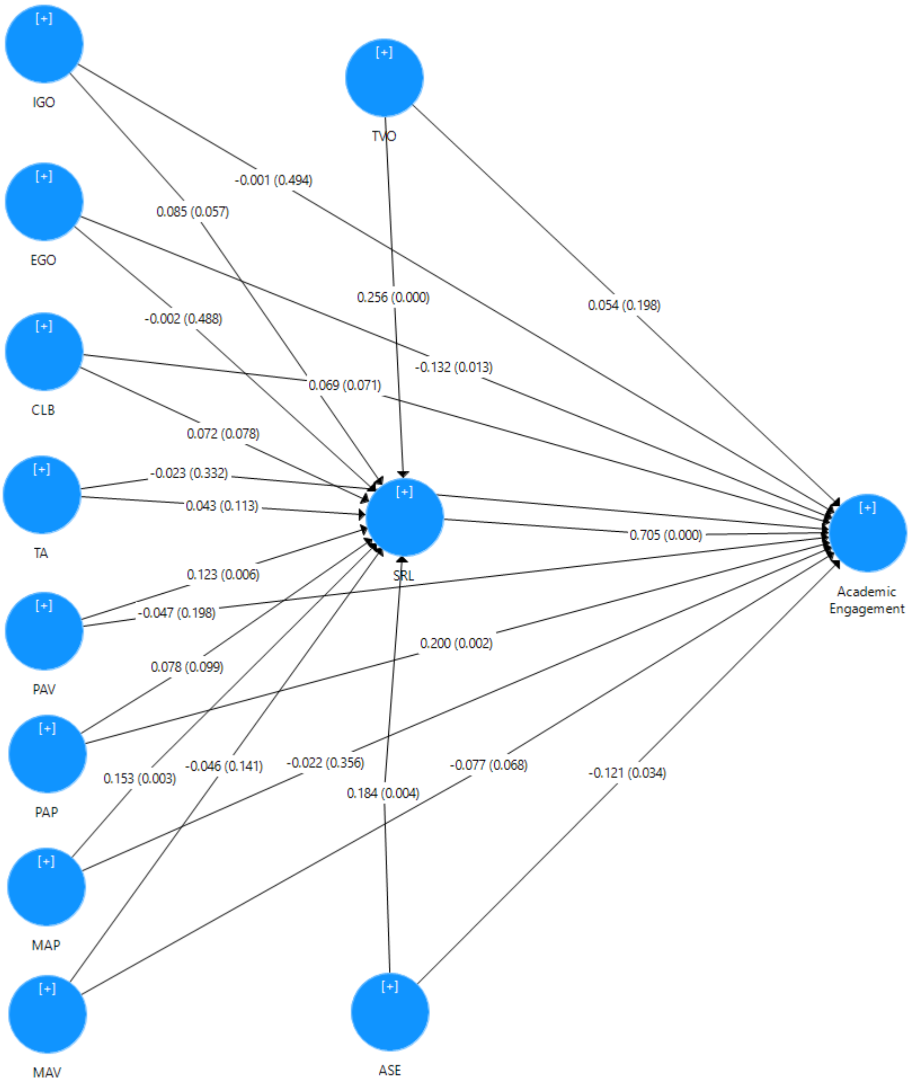

IGO1
IGO2
IGO3
IGO4
EGO1
EGO2
EGO3
EGO4
CLB1
CLB2
CLB3
CLB4
TA2
TA4
TA5
PAV1
PAV2
PAV3
PAP1
PAP2
PAP3
MAP1
MAP2
MAP3
MAV1
MAV2
MAV3
IGO
EGO
CLB
TA
PAV
PAP
MAP
MAV
TVO
TVO1
TVO2
TVO3
TVO4
TVO5
TVO6
SRL
CT
ELB
HS
MSR
ORG
PL
RH
TSEM
ASE
ASE1
ASE2
ASE3
ASE5
ASE6
ASE7
ASE8
Academic Engagement
AE
BE
CE
EE
0.386 (0.001)
0.164 (0.104)
-0.075 (0.274)
0.196 (0.022)
0.149 (0.090)
-0.099 (0.235)
0.053 (0.358)
0.188 (0.035)
0.052 (0.331)
0.186 (0.033)
0.680 (0.000)

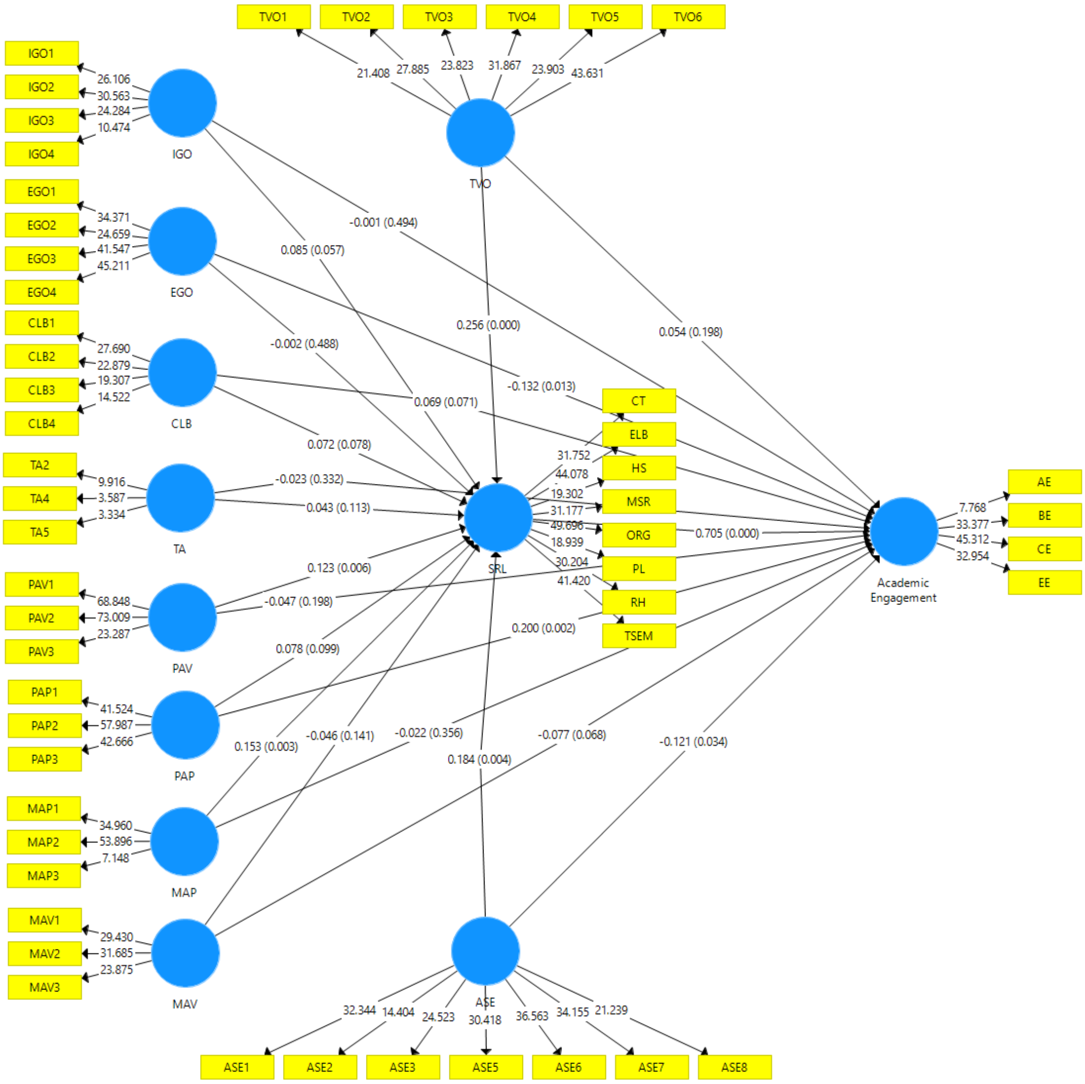
APPENDIX T

TOTAL EFFECTS RESULTS FOR MEDIATION

Path	β	Sample mean (M)	SD	T statistics (|O/STDEV|)	P values	5.0%	95.0%
ASE -> Academic Engagement	0.080	0.080	0.036	2.191	0.014	0.028	0.148
CLB -> Academic Engagement	0.030	0.031	0.025	1.233	0.109	-0.003	0.079
EGO -> Academic Engagement	-0.001	-0.001	0.023	0.049	0.480	-0.041	0.036
IGO -> Academic Engagement	0.035	0.037	0.025	1.413	0.079	-0.002	0.080
MAP -> Academic Engagement	0.066	0.066	0.030	2.204	0.014	0.024	0.126
MAV -> Academic Engagement	-0.021	-0.018	0.020	1.034	0.151	-0.061	0.006
PAP -> Academic Engagement	0.035	0.035	0.028	1.250	0.106	-0.006	0.087
PAV -> Academic Engagement	0.051	0.052	0.026	1.945	0.026	0.016	0.103
TA -> Academic Engagement	0.018	0.020	0.017	1.108	0.134	-0.007	0.047
TVO -> Academic Engagement	0.112	0.111	0.038	2.953	0.002	0.057	0.184

BOOTSTRAPPING RESULTS FOR MEDIATION




TVO1
TVO2
TVO3
TVO4
TVO5
TVO6
IGO1
IGO2
IGO3
IGO4
IGO
TVO
EGO1
EGO2
EGO3
EGO4
EGO
CLB1
CLB2
CLB3
CLB4
CLB
TA2
TA4
TA5
TA
PAV1
PAV2
PAV3
PAV
PAP1
PAP2
PAP3
PAP
MAP1
MAP2
MAP3
MAP
MAV1
MAV2
MAV3
MAV
SRL
ASE
ASE1
ASE2
ASE3
ASE5
ASE6
ASE7
ASE8
CT
ELB
HS
MSR
ORG
PL
RH
TSEM
Academic Engagement
AE
BE
CE
EE
0.705 (0.000)
0.256 (0.000)
0.054 (0.198)
-0.001 (0.494)
0.085 (0.057)
-0.002 (0.488)
-0.132 (0.013)
0.069 (0.071)
0.072 (0.078)
-0.023 (0.332)
0.043 (0.113)
0.123 (0.006)
-0.047 (0.198)
0.200 (0.002)
0.078 (0.099)
0.153 (0.003)
-0.046 (0.141)
-0.022 (0.356)
0.184 (0.004)
-0.077 (0.068)
-0.121 (0.034)