

Influence of Grit on Self-Efficacy and Self-Regulation in Language Learning Using the PLS-SEM Analysis

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ABSTRACT

The study of self-efficacy and self-regulation has been a frequent trend in the language learning field as of recently. However, when discussing these topics, it is undeniable that the consistency of interest and perseverance would also come into play for an effective learning experience. This study explores the relationships and effects of Consistency of Interest and Perseverance on Self-Efficacy and Self-Regulation among foreign language learners. A survey consists of four parts; Part 1 - Demographic Profile, Part 2 - Grit (12 items). Part 3 - Motivational Beliefs (22 items) and Part 4 - Self-Regulated Learning Strategies (22 items), were used to collect data from 113 foreign language learners in a public university in Malaysia. The data, then, were analysed quantitatively using SmartPLS. The finding shows that perseverance has a positive relationship and effect with self-regulation and self-efficacy. While, consistency of interest does not. This indicates that perseverance is the main factor in learners' self-confidence and self-learning, providing educational and motivational implication in foreign language learning.

Keywords: Grit, Language Learning, PLS-SEM Analysis Self-Efficacy, Self-Regulation

INTRODUCTION

According to Duckworth et al (2007), Grit involves two psychological components when a person is committed to their goals which are consistency of interest and perseverance of effort. These traits could impact learners on keeping their motivation, confidence with their abilities (self-efficacy), and adjusting their own learning activities (self-regulation) when it comes to language learning. Self-efficacy, also referred to as personal efficacy by Bandura (1977), influences a learners' decision to initiate coping behaviors, the measurement of effort they invest, and how determined they are to put an effort when encountering obstacles and negative experiences. Meanwhile, Zimmerman (2000) viewed self-regulation as thoughts, feelings, and actions that generate independently and are designed and cyclically changed to the achievement of personal goals. It is vital for instructors to examine these variables as it can assist in forming a more effective learning environment and encourage learners to commit and learn in their own style.

Due to the self-efficacy and self-regulation concepts that caught many attentions in the language learning field, learners' retention towards their lessons also has become a vital discussion. Brown (2012) explained that as accountability pressures rise and resources in higher education fall, focus on learners' retention and the reasons learners keep on studying at post-secondary institutions remains prominent. Wang (2021) stated that a persistent learner had improved coping ability with mistakes and difficulties instead of allowing bad situation stifle their performance. Wang (2021) further discussed that educational institutions globally continuously encounter issues in regards to learner engagement, low academic performance as well as unsatisfactory level of persistence rates. Therefore, there is a need to investigate how the components of grit interact with learners' beliefs and learning strategies in language education.

On top of that, this study utilized Partial Least Squares Structural Equation Modeling (PLS-SEM), unlike previous studies that used quantitative methods like Mikami and Shiozawa, (2024) and literature reviews like

Wang (2021), to examine the complex connection between constructs simultaneously. PLS-SEM is suitable to be used to examine the measurement model (reliability and validity of constructs) and the structural model (relationships between variables). Thus, allowing this study to provide a more detailed understanding of how grit impacts self-efficacy and self-regulation in language learning.

Research Objective, Research Questions, and Hypothesis

The research questions will be answered using SmartPLS analysis using both measurement and structural models.

Table 1- Research Objectives, Research Questions and Research Hypothesis

RESEARCH OBJECTIVES	RESEARCH QUESTIONS	RESEARCH HYPOTHESIS
To investigate if there is a significant relationship between Consistency of Interest and Self-Efficacy	Is there a significant relationship between Consistency of Interest and Self-Efficacy?	Ho1: There is no significant relationship between Consistency of Interest and Self-Efficacy
To investigate if there is a significant relationship between Consistency of Interest and Self-Regulation	Is there a significant relationship between Consistency of Interest and Self-Regulation?	Ho2: There is no significant relationship between relationship between Consistency of Interest and Self-Regulation
To investigate if there is a significant relationship between Perseverance and Self-Efficacy	Is there a significant relationship between Perseverance and Self-Efficacy?	Ho3: There is no significant relationship between Perseverance and Self-Efficacy
To investigate if there is a significant relationship between Perseverance and Self-Regulation	Is there a significant relationship between Perseverance and Self-Regulation?	Ho4: There is no significant relationship between Perseverance and Self-Regulation
To investigate if there is a significant effect between Consistency of Interest and Self-Efficacy	Is there a significant effect between Consistency of Interest and Self-Efficacy?	Ho5: There is no significant between Consistency of Interest and Self-Efficacy
To investigate if there is a significant effect between Consistency of Interest and Self-Regulation	Is there a significant effect between Consistency of Interest and Self-Regulation?	Ho6: There is no significant between Consistency of Interest and Self-Regulation
To investigate if there is a significant effect between Perseverance and Self-Efficacy	Is there a significant effect between Perseverance and Self-Efficacy?	Ho7: There is no significant between Consistency of Interest and Self-Efficacy
To investigate if there is a significant effect between Perseverance and Self-Regulation	Is there an effect significant between Perseverance and Self-Regulation?	Ho8: There is no significant between Perseverance and Self-Regulation

LITERATURE REVIEW

Theoretical Framework: Self-Efficacy Theory

The Self-Efficacy Theory proposed by Albert Bandura (1977) explains that individuals' beliefs about their capabilities to perform specific tasks strongly influence their motivation, effort, persistence, and performance. Self-efficacy refers to a person's judgment of how well they can organize and execute actions required to achieve

particular goals. According to Bandura, these beliefs develop through four main sources: mastery experiences, vicarious experiences, social persuasion, and physiological or emotional states. Mastery experiences, such as successfully completing tasks, strengthen individuals' confidence in their abilities, while observing others succeed (vicarious experiences) can also enhance self-beliefs. Encouragement from teachers or peers (social persuasion) and positive emotional conditions further contribute to stronger self-efficacy. In the context of language learning, self-efficacy plays an important role in shaping learners' willingness to participate in communicative activities and persist in challenging tasks such as speaking, writing, or understanding complex texts. Learners with high language self-efficacy are more likely to take risks in using the target language, apply learning strategies effectively, and remain motivated despite difficulties. Conversely, learners with low self-efficacy may avoid language tasks and experience anxiety during communication. Therefore, strengthening learners' confidence in their language abilities can significantly enhance their engagement and overall language learning success.

Theoretical Framework: Self-Regulated Learning Theory

The self-regulated learning theory proposed by Zimmerman (2002) explains that effective learning occurs when learners actively control and regulate their cognitive, motivational, and behavioral processes to achieve academic goals. Zimmerman describes self-regulated learning as a cyclical process consisting of three phases: forethought, performance, and self-reflection. In the forethought phase, learners set learning goals and plan strategies before beginning a task. During the performance phase, they monitor their understanding, apply strategies, and manage their attention while completing learning activities. In the self-reflection phase, learners evaluate their performance and adjust their strategies for future tasks. In the context of language learning, self-regulation is particularly important because acquiring a new language requires continuous practice, monitoring, and strategic effort. Language learners who are self-regulated actively plan how to study vocabulary, grammar, reading, and speaking tasks, while monitoring their comprehension and progress during learning activities. They also evaluate their language performance and modify strategies when difficulties arise. Through these processes, learners become more autonomous and responsible for their own learning. Zimmerman's theory therefore highlights that successful language learning is not only dependent on instruction but also on learners' ability to regulate their learning strategies, motivation, and learning environments effectively.

Theoretical Framework: Theory of Grit

The Grit Theory proposed by Duckworth, et al. (2007) explains that long-term success is strongly influenced by an individual's sustained passion and perseverance toward achieving long-term goals. Grit consists of two main components: consistency of interest and perseverance of effort. Consistency of interest refers to an individual's ability to maintain stable goals and interests over time without frequently changing direction, while perseverance of effort reflects the capacity to continue working hard despite difficulties, failures, or slow progress. According to Duckworth and her colleagues, individuals who possess high levels of grit are more likely to remain committed to challenging tasks and persist until they achieve mastery. In the context of language learning, grit plays an important role because acquiring a new language is a long-term and demanding process that requires continuous practice and sustained motivation. Consistency of interest helps language learners remain focused on improving their language proficiency over extended periods, even when progress appears gradual. Perseverance of effort enables learners to continue practicing speaking, reading, writing, and listening despite challenges such as complex grammar rules, unfamiliar vocabulary, or communication difficulties. Therefore, learners who demonstrate higher levels of grit are more likely to maintain engagement, overcome learning obstacles, and ultimately achieve greater success in language acquisition.

Past Studies on Motivation and Consistency of Interest

Recent studies studied the issue of motivation with consistency of interest through the lens of foreign language or second language learning. These studies agreed that language learners' interest highly influenced their motivation as well as their performance.

Wang et al (2021) examined the co-development of English as foreign language (EFL) learners' aspect of perseverance of effort (PE) and consistency of interest (CI), the two subdomains of grit in a duration of time.

The L2 grit scale was used for data collection and was disseminated to 1,384 adult EFL learners in four measurement occasions. The data obtained, then, were analyzed using Mplus with FCM in three steps. Their findings revealed that, even though their level of improvement differs, overall perseverance of effort (PE) and consistency of interest (CI) developed throughout time. However, there is an insignificant relationship between their initial level and growth rate as learners who are weaker in the beginning, tend to show better improvement.

Guoxing et al (2023) studied how motivation, personal traits and emotional factors affect willingness to communicate (WTC) in the perspective of learning Chinese as a second language (Chinese L2). This study utilized a quantitative methodology using questionnaires that looked into motivation, enjoyment, boredom, shyness, and willingness to communicate. 251 Chinese L2 learners in New Zealand responded and the data were analyzed using a statistical tool called PROCESS macro. Guoxing et al (2023) discovered that L2 enjoyment influenced the connection between motivational intensity and willingness to communicate. On top of that, shyness and L2 boredom not only weaken the relationship between enjoyment and WTC, but also the significant relationship between motivation and WTC.

While the recent studies focus on quantitative analysis similar to this study, studies that utilize SmartPLS are yet to be seen, especially when examining consistency of interest and perseverance together with self-efficacy and self-regulation.

Past Studies on Motivation and Perseverance

Previous studies investigated the issue of motivation together with perseverance through the lens of language learning. These studies agreed that language learners with high perseverance have also high motivation and academic achievement.

Sudina and Plonsky (2021) investigates grit and its conceptual correlates which was drawn from the framework for noncognitive factors in academic performance and academic perseverance. A survey that looked into their foreign language (FL) grit, conscientiousness, intended effort, and buoyancy was given to 360 FL learners and discovered that grit and intended effort largely overlap but was determined to conceptually differ from buoyancy and from the industriousness component of conscientiousness. Unlike previous research, the consistency-of-interest dimension of grit was a better predictor of foreign language achievement than perseverance of effort.

Teimouri et al (2022) examine the relationship between grit with motivational behaviour and language performance among 191 English as foreign language learners. Using self-reported data, test scores, and observational data, Teimouri et al (2022) has collected data on learners' personality traits, motivation, emotions, and language achievement. They discovered that a gritty learner has more motivation, is engaged cognitively, not very anxious and has higher belief in growth mentality, resulting in positive language learning experience and performance. Furthermore, L2 grit, mainly perseverance of effort, has significant correlation with language performance measures.

While the previous studies focus on motivation and perseverance, there remains a lack of data from other methods of quantitative analysis like SmartPLS, particularly in the context of foreign language learning.

Conceptual Framework and Proposed Model of the Study

The conceptual framework of this study (Figure 1) examines the influence of grit on learners' motivation and learning strategies using Partial Least Squares Structural Equation Modeling (PLS-SEM). The framework is based on the instrument developed by Martin et al. (2022), which integrates key constructs related to grit, motivational beliefs, and self-regulated learning strategies. In the proposed model, grit is represented through two dimensions: consistency of interest and perseverance, while motivational beliefs and learning strategies are represented by self-efficacy and self-regulation respectively. The theoretical foundation of this framework is grounded in the Grit Theory proposed by Duckworth et al. (2007), which emphasizes that long-term success is influenced by sustained passion and persistent effort toward achieving goals. Consistency of interest refers to

maintaining stable goals and long-term commitment, whereas perseverance reflects the ability to continue working toward goals despite challenges. In learning contexts, these dimensions of grit encourage learners to remain focused on their academic objectives and persist in the face of difficulties.

The framework also integrates the Self-Efficacy Theory proposed by Albert Bandura (1977), which explains that individuals' beliefs about their abilities significantly influence their motivation, effort, and performance. In this model, self-efficacy represents learners' confidence in their ability to successfully perform learning tasks and achieve academic outcomes. Learners with higher self-efficacy are more likely to demonstrate persistence and sustained engagement in their learning activities. Additionally, the framework incorporates the Self-Regulated Learning Theory developed by Zimmerman (2002), which highlights learners' ability to actively regulate their cognition, motivation, and behaviors during the learning process. Self-regulation involves planning, monitoring, and evaluating learning activities to achieve academic goals.

Based on the proposed diagram, the structural relationships suggest that self-efficacy influences both dimensions of grit, namely consistency of interest and perseverance. In turn, these grit components are expected to influence self-regulated learning, indicating that learners who maintain stable interests and demonstrate perseverance are more likely to regulate their learning strategies effectively. Through the application of PLS-SEM analysis, this framework allows for the examination of the complex relationships among motivational beliefs, grit, and self-regulated learning strategies. Overall, the model highlights the role of learners' motivational confidence and persistence in fostering effective self-regulation and sustained engagement in learning processes.

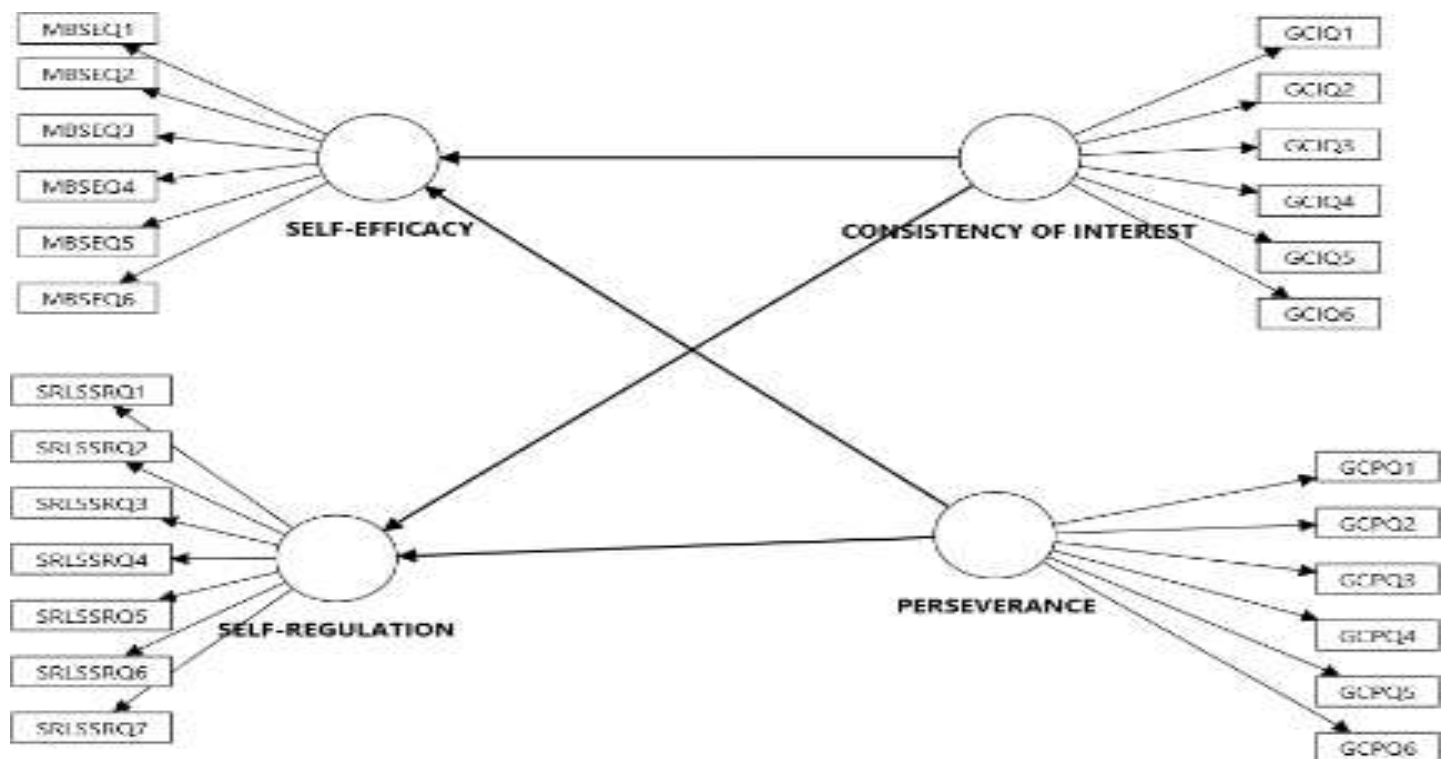


Figure 1 The Conceptual Framework – Influence of grit on Self-Efficacy and Self-Regulation in Language Learning

METHODOLOGY

Research Design

This study employs a quantitative design. The research goal is to explore an extension of an existing theory/predict a theory. The model (Figure 2) chosen for this study is a hierarchical component model, Type II, which utilizes a combination of reflective-reflective models. According to Fornell and Bookstein (1982), a reflective model is employed when the construct is a trait and explains the indicators.

Population and Sample

According to Ziegenfuss (2021), researchers report demographic data in percentages to establish sample representatives and allow for generalizability to a larger population. Presenting in percentages also provides an overview of participants' characteristics and offers a clear and understandable picture of the sample makeup

Table 2 - Percentage for Demographic Profile

QUESTION	DEMOGRAPHIC PROFILE	CATEGORIES	PERCENTAGE (%)
1	Gender	Male (55)	48.6%
		Female (58)	51.4%
2	Discipline	Social Sciences (71)	62.8%
		Science & Technology (42)	37.2%

Table 2 presents the demographic profile of the study participants. Regarding gender, 48.6% of the respondents are male (55 participants), while 51.4% are female (58 participants), indicating a fairly balanced gender distribution. In terms of discipline, the majority of participants are from Social Sciences (62.8%, 71 participants), while Science & Technology accounts for 37.2% (42 participants). These demographics provide context for interpreting the study results, showing a slight predominance of female respondents and a higher representation from Social Sciences compared to Science & Technology.

Instrument

Table 3 presents the distribution of items included in the questionnaire. The instrument used a 5 Likert scale with scale 1 is never. Scale 2 represents rarely. Scale 3 represents sometimes, while scale 4 is often and scale 5 is always.

Table 3 - Distribution for Item in Instrument

PART	STRATEGY		SCALE	NO OF ITEMS	TOTAL ITEMS
One	Demographic Profile				
Two	Grit		Consistency of Interest	6	12
			Perseverance	6	
Three	Motivational Beliefs	A	Self-Efficacy	9	22
		B	Intrinsic Value	9	
		C	Test Anxiety	4	
Four	Self-Regulated Learning Strategies	D	Cognitive Strategy Use	13	22
		E	Self-Regulation	9	
	Total No of Items				44

The questionnaire, adapted from Campos,et.al, 2011 and Pintrich & DeGroot, 1990 comprises variables representing the model formed. Table 3 presents the distribution of items in the research instrument used in this study. The questionnaire consists of four main parts with a total of 44 items. Part One collects respondents' demographic profiles. Part Two measures Grit, which includes Consistency of Interest (6 items) and Perseverance (6 items), totalling 12 items. Part Three focuses on Motivational Beliefs, comprising Self-Efficacy (9 items), Intrinsic Value (9 items), and Test Anxiety (4 items), with a total of 22 items. Part Four measures Self-Regulated Learning Strategies, including Cognitive Strategy Use (13 items) and Self-Regulation (9 items), resulting in 22 items overall.

Data Collection and Data Analysis

Data is collected via a Google Form. The data is then analysed using SmartPLS 4 through two main stages. As suggested by (Hair,et.al. 2017), data analysis is done at two levels: the measurement and structural model. The first stage is the measurement model, which measures the outer model. The second stage is the structural model, which measures the inner model. The analysed data is used to answer the research questions and also to confirm the model chosen.

FINDINGS AND DISCUSSION

The model formed for this study is that of lower order construct (LOC). The reflective measurement model was chosen. A reflective measurement model is the formation of a single unobserved latent construct and this construct influences multiple variables (indicators). Another key feature of LOC is that the indicators are interchangeable.

The findings are presented in two stages. The first stage presents the measurement model, and the third stage reveals the structural model as well as answers research questions.

Measurement Model

In SmartPLS, the measurement model assesses the reliability and validity of the constructs. This is done by examining the relationships between them and their observable behavior. The measurement model measures the outer model. Figure 2 below shows the measurement model for this study. Further detailed explanation of this model is elaborated in tables below.

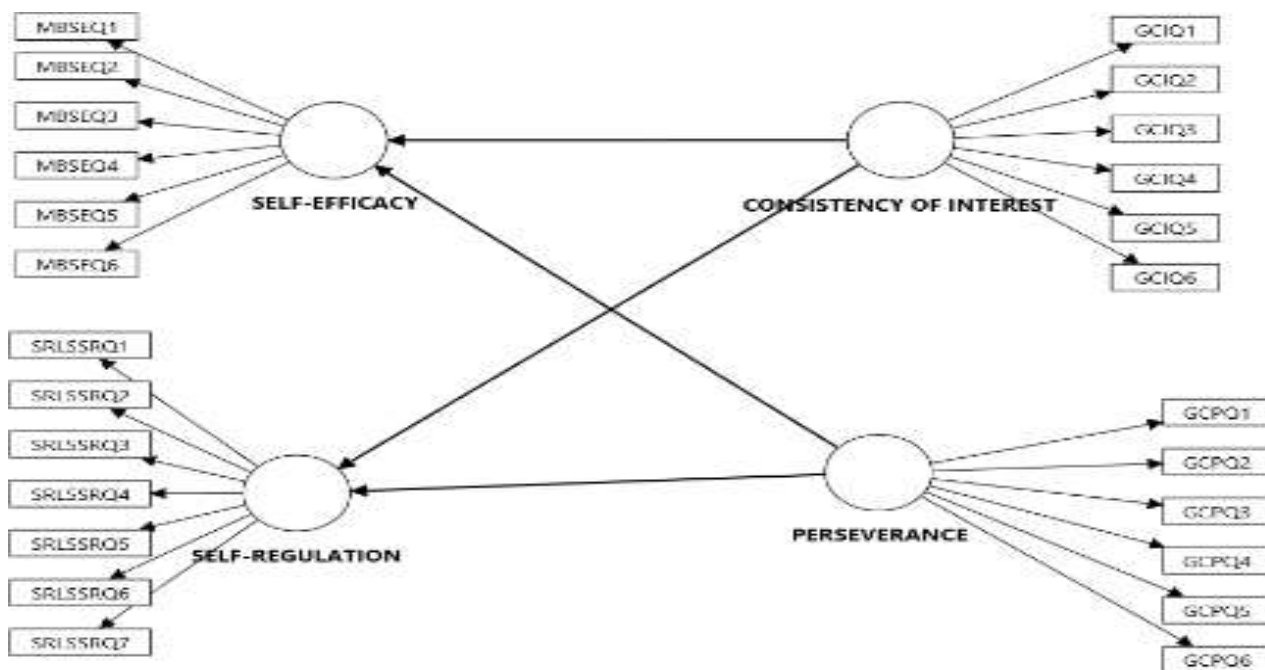


Figure 2 Measurement Model for the Influence of Grit on Self-Efficacy and Self-Regulation in Language Learning

Reliability

According to (Ringle & Sarstedt (2016)), reliability is assessed by checking indicator reliability and internal consistency reliability. Internal consistency is done using Composite reliability (ρ_c) and Cronbach's Alpha. The cut-off value for Cronbach's Alpha is 0.70 to 0.90. The cut-off values for composite reliability (ρ_c) are 0.70-0.90. For indicator reliability, the factor loadings cut-off values are >0.70 and squared loadings ≥ 0.50 . Finally, the cut-off values for Average Variance Extracted (AVE) ≥ 0.50 .

Table 4 - Results for Reliability- Consistency of Interest

CONSTRUCT/ ITEM	FACTOR LOADING	CRONBA CH'S ALPHA	COMPOSITE RELIABILITY (ρ_c)	AVERAGE EXTRACTED (AVE)
		0.683	0.859	0.753
GCIQ3	0.919			
GCIQ4	0.813			

Table 4 presents the reliability and internal consistency results for the construct Consistency of Interest. The overall Cronbach's alpha value is 0.683, indicating an acceptable level of internal consistency for the construct. The Composite Reliability (ρ_c) is 0.859, demonstrating good reliability of the measurement model. Additionally, the Average Variance Extracted (AVE) is 0.753, which exceeds the recommended threshold of 0.50, suggesting strong convergent validity. The factor loadings for the items are also high, with GCIQ3 showing a loading of 0.919 and GCIQ4 at 0.813, indicating that both items strongly represent the Consistency of Interest construct.

Table 5 - Results for Reliability- Perseverance

CONSTRUCT/ ITEM	FACTOR LOADING	CRONBACH H'S ALPHA	COMPOSITE RELIABILITY (ρ_c)	AVERAGE VARIANCE EXTRACTED (AVE)
		0.817	0.916	0.844
GCPQ5	0.902			
GCPQ6	0.935			

Table 5 presents the reliability results for the construct Perseverance. The Cronbach's alpha value is 0.817, indicating good internal consistency among the items measuring this construct. The Composite Reliability (ρ_c) is 0.916, which suggests a high level of reliability for the measurement model. Furthermore, the Average Variance Extracted (AVE) is 0.844, exceeding the recommended threshold of 0.50 and demonstrating strong convergent validity. The factor loadings for the items are also very high, with GCPQ5 showing a loading of 0.902 and GCPQ6 at 0.935, indicating that both items strongly represent the Perseverance construct.

Table 6 - Results for Reliability- Self-Efficacy

CONSTRUCT/ ITEM	FACTOR LOADING	CRONBACH' S ALPHA	COMPOSITE RELIABILITY (ρ_c)	AVERAGE VARIANCE EXTRACTED (AVE)
		0.789	0.855	0.541
MBSEQ1	0.703			
MBSEQ3	0.725			
MBSEQ4	0.764			
MBSEQ5	0.733			
MBSEQ6	0.751			

Table 6 presents the reliability and validity results for the construct Self-Efficacy. The Cronbach's alpha value is 0.789, indicating acceptable internal consistency among the items measuring this construct. The Composite Reliability (ρ_c) is 0.855, demonstrating good reliability of the measurement model. The Average Variance Extracted (AVE) is 0.541, which exceeds the recommended threshold of 0.50 and indicates adequate convergent validity. The factor loadings for the items range from 0.703 to 0.764, with MBSEQ1 (0.703), MBSEQ3 (0.725), MBSEQ4 (0.764), MBSEQ5 (0.733), and MBSEQ6 (0.751), suggesting that all items adequately contribute to representing the Self-Efficacy construct.

Table 7 - Results for Reliability- Self-Regulation

CONSTRUCT/ ITEM	FACTOR LOADING	CRONBACH H'S ALPHA	COMPOSITE RELIABILITY (ρ_c)	AVERAGE VARIANCE EXTRACTED (AVE)
		0.562	0.819	0.694
SRLSSRQ1	0.791			
SRLSSRQ7	0.872			

Table 7 presents the reliability results for the construct Self-Regulation. The Cronbach's alpha value is 0.562, indicating a relatively low but still acceptable level of internal consistency for exploratory research. The Composite Reliability (ρ_c) is 0.819, suggesting good reliability of the construct despite the lower alpha value. The Average Variance Extracted (AVE) is 0.694, which exceeds the recommended threshold of 0.50 and indicates

strong convergent validity. The factor loadings for the items are high, with SRLSSRQ1 showing a loading of 0.791 and SRLSSRQ7 at 0.872, indicating that both items adequately represent the Self-Regulation construct.

Validity

According to Ramayah et.al. (2018), for validity, the Discriminant validity (HTMT) needs to be <0.85 or <0.90 .

Table 8 - Discriminant Validity (HTMT)

	CONSISTENCY OF INTEREST	PERSEVERANCE	SELF-EFFICACY
CONSISTENCY OF INTEREST			
PERSEVERANCE	0.25		
SELF-EFFICACY	0.205	0.485	
SELF-REGULATION	0.337	0.481	0.493

Table 8 presents the discriminant validity results using the Heterotrait–Monotrait Ratio (HTMT). The HTMT values between the constructs range from 0.205 to 0.493, all of which are below the recommended threshold of 0.85, indicating that discriminant validity is established. The relationship between Consistency of Interest and Perseverance shows an HTMT value of 0.25, while Consistency of Interest and Self-Efficacy records 0.205. The value between Perseverance and Self-Efficacy is 0.485. Additionally, Self-Regulation shows HTMT values of 0.337 with Consistency of Interest, 0.481 with Perseverance, and 0.493 with Self-Efficacy. These results confirm that the constructs are distinct and measure different concepts within the model.

Structural Model

In SmartPLS, the structural model visualizes the hypothesized causal relationships between constructs. The structural model is thus formed after the researcher has established the reliability and validity in the measurement model. For the analysis of the structural model, the researcher runs bootstrapping and examines the collinearity, path coefficients of determination, effect size, PLS predict, and IPMA. In addition to that, the analysis in the structural model allows the researcher to answer research questions 1-6 and hypotheses 1-3). Figure 3 below shows the structural model for this study. Detailed explanation is elaborated in Tables below.

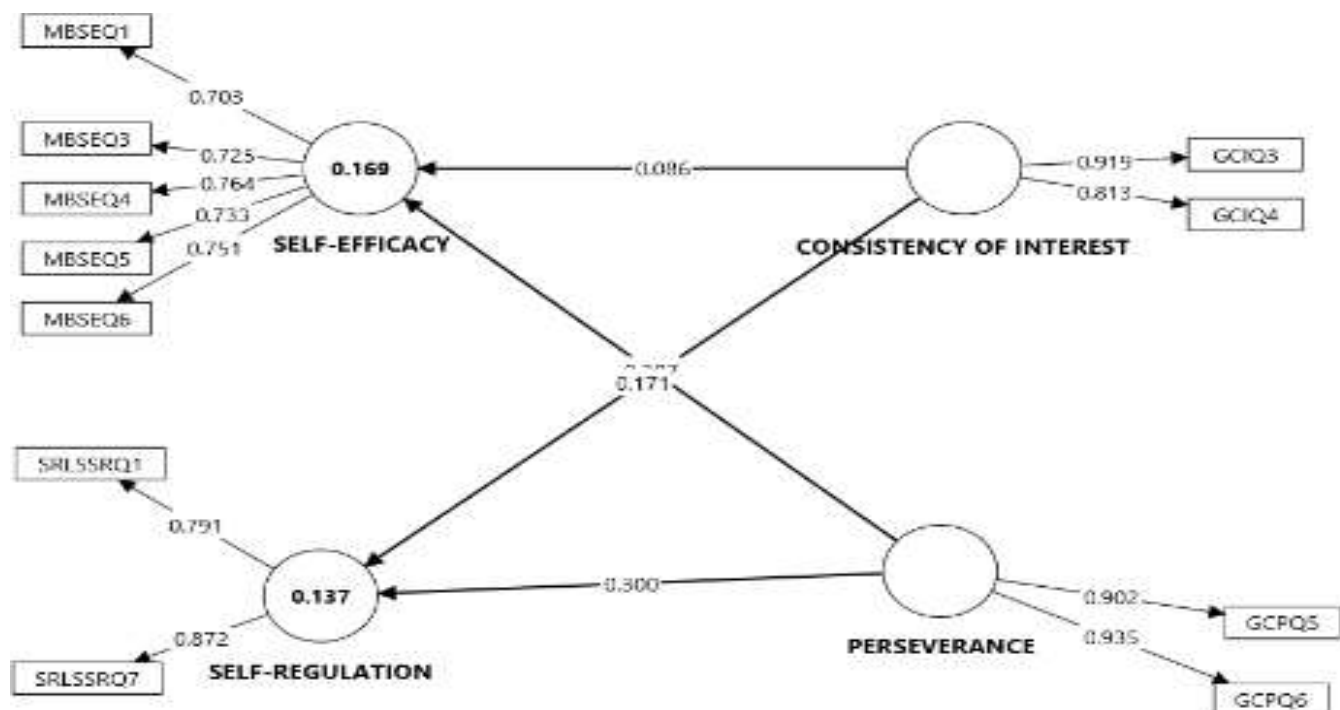


Figure 3 Structural Model Composing through Socio-Cultural theory Collinearity

According to (Ringle & Sarstedt (2016)), the cut-off value for collinearity inner model VIF is ≤ 5.0 .

Table 9 - Collinearity

	ORIGINAL SAMPLE (O)
CONSISTENCY OF INTEREST -> SELF-EFFICACY	1.032
CONSISTENCY OF INTEREST -> SELF-REGULATION	1.032
PERSEVERANCE -> SELF-EFFICACY	1.032
PERSEVERANCE -> SELF-REGULATION	1.032

Table 9 presents the collinearity assessment results for the structural model. The Variance Inflation Factor (VIF) values for all relationships are 1.032, including the paths from Consistency of Interest to Self-Efficacy, Consistency of Interest to Self-Regulation, Perseverance to Self-Efficacy, and Perseverance to Self-Regulation. These values are well below the commonly accepted threshold of 5.0 (or the stricter threshold of 3.3), indicating that there are no collinearity issues among the predictor constructs. Therefore, the results suggest that the independent variables do not exhibit multicollinearity and are suitable for further analysis in the structural model.

Coefficients of determination (R²)

According to Ramayah,et.al. (2018) For coefficients of determination (R²) 0.2 to 0;7, depending on the field of study. Social Sciences & Economics follows the range above.

Table 10-R²

	ORIGINAL SAMPLE (O)
SELF-EFFICACY	0.169
SELF-REGULATION	0.137

Table 10 presents the R² values for the endogenous constructs in the structural model. The R² value for Self-Efficacy is 0.169, indicating that 16.9% of the variance in Self-Efficacy is explained by the predictor variables in the model. Meanwhile, the R² value for Self-Regulation is 0.137, showing that 13.7% of the variance in Self-Regulation is accounted for by the independent constructs. These values suggest that the model has a moderate explanatory power, indicating that Consistency of Interest and Perseverance contribute to explaining the variance in both Self-Efficacy and Self-Regulation, although other factors may also influence these constructs.

P-Value

According to Goodman (1999), a threshold of p-value is the cut-off for determining statistical significance, most commonly set at 0.05. Below is the table that interprets the threshold.

Table 11- Interpretation for p-value

THRESHOLDS	INTERPRETATION	DECISION
$p \leq 0.05$	Often considered statistically significant	Reject H ₀
$p \leq 0.01$	Indicates very strong evidence against H ₀	Reject H ₀
$p > 0.05$	Weak or no evidence against H ₀	Failure to reject H ₀

Table 11 shows the interpretation for p=value. According to Goodman (1999), if the p-value is $p \leq 0.05$, the data is often considered statistically significant and the null hypothesis is rejected. If it is $p \leq 0.01$, then it indicates very strong evidence to reject the null hypothesis (H₀). However, a $p > 0.05$ is considered weak and there is no evidence to reject the null hypothesis.

Table 12-Path Coefficient for the current study

	T STATISTICS (O/STDEV)	P VALUES
CONSISTENCY OF INTEREST -> SELF-EFFICACY	0.943	0.346
CONSISTENCY OF INTEREST -> SELF-REGULATION	1.884	0.06

PERSEVERANCE -> SELF-EFFICACY	4.639	0
PERSEVERANCE -> SELF-REGULATION	3.554	0

Table 12 presents the path coefficient results for the relationships among the constructs in the current study. The results show that Perseverance has a significant positive effect on both Self-Efficacy and Self-Regulation, with T-statistics of 4.639 ($p = 0.000$) and 3.554 ($p = 0.000$) respectively, indicating strong statistical significance. In contrast, the relationship between Consistency of Interest and Self-Efficacy is not significant, with a T-statistic of 0.943 ($p = 0.346$). Similarly, the relationship between Consistency of Interest and Self-Regulation is not statistically significant at the 0.05 level, although it is close to the threshold with a T-statistic of 1.884 ($p = 0.060$). These findings suggest that Perseverance plays a more influential role than Consistency of Interest in predicting both Self-Efficacy and Self-Regulation in this study.

Effect Size (f^2)

According to Ramayah, et.al. (2018), the cut off values for effect sizes (f^2) are 0.02 (small), 0.15 (medium), and 0.35 (large). This section presents data to answer research questions and hypotheses;

RQ5- Is there a significant effect for connectivism on diversity, openness, connectedness, and autonomy?

H05- There is no significant effect for connectivism on diversity, openness, connectedness, and autonomy

According to Ringle, et.al (2024), for effect size, values from 0.02 to 0.15 are considered small. Values between 0.15 to 0.35 are considered medium while values 0.35 and above are considered large.

Table 13- Effect Size

	ORIGINAL SAMPLE (O)	INTERPRETATION
CONSISTENCY OF INTEREST -> SELF-EFFICACY	0.009	SMALL
CONSISTENCY OF INTEREST -> SELF-REGULATION	0.033	MEDIUM
PERSEVERANCE -> SELF-EFFICACY	0.174	MEDIUM
PERSEVERANCE -> SELF-REGULATION	0.101	MEDIUM

Table 13 presents the effect size (f^2) results for the relationships among the constructs in the model. The findings show that Consistency of Interest has a small effect on Self-Efficacy ($f^2 = 0.009$) and a moderate effect on Self-Regulation ($f^2 = 0.033$). In contrast, Perseverance demonstrates a stronger influence, with a moderate effect on Self-Efficacy ($f^2 = 0.174$) and a moderate effect on Self-Regulation ($f^2 = 0.101$). These results indicate that Perseverance contributes more substantially to explaining variations in Self-Efficacy and Self-Regulation compared to Consistency of Interest, highlighting its greater importance in the structural model.

PLS Predict (Q2)

In PLS-SEM, it is stated that $Q^2 \geq 0$ (Ringle et.al., 2024). Table 14 below reveals the PLS Predict (Q2) for the dependent variable. The analysis reveals the Q2 for all items in the dependent variable -connectedness.

Table 14- PLS Predict (Q^2)

	Q²PREDICT	RMSE	MAE
SELF-EFFICACY	0.116	0.956	0.747
SELF-REGULATION	0.092	0.968	0.779

The PLS Predict results show that the model has positive predictive relevance for both constructs, with Q^2 values of 0.116 for Self-Efficacy and 0.092 for Self-Regulation, indicating that the model can meaningfully predict new observations. The RMSE values (0.956 and 0.968) and MAE values (0.747 and 0.779) suggest moderate prediction errors, which are acceptable in social science research. Overall, the model demonstrates reasonable accuracy and predictive capability, performing slightly better for Self-Efficacy than Self-Regulation.

IPMA

IPMA or Importance-Performance Matrix Analysis. According to Ringle & Sarstedt (2016), IPMA is used to evaluate the performance and importance of the chosen constructs or indicators within a model. In the context of this study, individual IPMA analysis was done on each construct and reported in Table 15.

Table 15- Latent Variables Average Performance (Performance)

	LV PERFORMANCE VALUE, AVERAGE
CONSISTENCY OF INTEREST	60.807
PERSEVERANCE	64.64
SELF-EFFICACY	58.675
SELF-REGULATION	74.17

According to jointly (Hauf, 2024) for PLS-SEM IPMA (Importance-Performance Map Analysis), there isn't a single "good score," but rather constructs with high importance (total effects) but low performance scores (rescaled 0-100) are key areas for improvement, indicating high potential for managerial action, while high importance/high performance is good, and low importance/low performance means less priority. Performance scores range 0-100, with higher values showing better attainment, but you interpret them relative to their importance.

Table 15 presents the average performance values of the latent variables in the study. Among the constructs, Self-Regulation records the highest average performance value (74.17), indicating that respondents demonstrate relatively strong self-regulated learning strategies. This is followed by Perseverance (64.64) and Consistency of Interest (60.807), suggesting moderate levels of grit among the participants. Meanwhile, Self-Efficacy shows the lowest average performance value (58.675), indicating comparatively lower confidence in learners' abilities. Overall, the results suggest that while learners show relatively strong self-regulation, their levels of grit and self-efficacy remain moderate and may benefit from further development in language learning contexts.

CONCLUSION AND DISCUSSION

The model formed for this study is that of lower order construct (LOC). The reflective measurement model was chosen. A reflective measurement model is the formation of a single unobserved latent construct and this construct influences multiple variables

Table 16- Outcome of Research Hypothesis

NO	RESEARCH QUESTION	RESEARCH HYPOTHESIS	OUTCOME
1	Is there a significant relationship between Consistency of Interest and Self-Efficacy?	Ho1: There is no significant relationship between Consistency of Interest and Self-Efficacy	Accept null hypothesis. There is no significant relationship between Consistency of Interest and Self-Efficacy.
2	Is there a significant relationship between Consistency of Interest and Self-Regulation?	Ho2: There is no significant relationship between Consistency of Interest and Self-Regulation	Accept null hypothesis. There is no significant relationship between Consistency of Interest and Self-Regulation.
3	Is there a significant relationship between Perseverance and Self-Efficacy?	Ho3: There is no significant relationship between Perseverance and Self-Efficacy	Reject null hypothesis. There is a relationship between Perseverance and Self-Efficacy.
4	Is there a significant relationship between	Ho4: There is no significant relationship between	Reject null hypothesis There is a relationship between Perseverance and Self-Regulation.

	Perseverance and Self-Regulation?	Perseverance and Self-Regulation	
5	Is there a significant effect between Consistency of Interest and Self-Efficacy?	Ho5: There is no significant between Consistency of Interest and Self-Efficacy	Accept null hypothesis. There is no significant effect between Consistency of Interest and Self-Efficacy.
6	Is there a significant effect between Consistency of Interest and Self-Regulation?	Ho6: There is no significant between Consistency of Interest and Self-Regulation	Accept null hypothesis. There is no significant effect between Consistency of Interest and Self-Regulation.
7	Is there a significant effect between Perseverance and Self-Efficacy?	Ho7: There is no significant between Consistency of Interest and Self-Efficacy	Reject null hypothesis. There is a significant effect between Perseverance and Self-Efficacy.
8	Is there an effect significant between Perseverance and Self-Regulation?	Ho8: There is no significant between Perseverance and Self-Regulation	Reject null hypothesis There is a significant effect between Perseverance and Self-Regulation.

Table 16 describes the outcome of research hypotheses for this research. The findings show that perseverance has a significant relationship and effect to self-efficacy and self-regulation, therefore, their null hypothesis is rejected. This indicates that learners who are more persistent tend to feel confident in their abilities and are able to regulate their learning better. On the other hand, consistency of interest has no significant relationship and effect to self-regulation and self-efficacy, thus making the null hypothesis to be accepted. This reveals that perseverance is the main factor of motivation for learners impacting learners' self-beliefs and self-learning, on the other hand, consistency of interest is not.

Implications and Suggestions for Future Research

Figure 4 below presents the proposed model for the Influence of Grit on Self-Efficacy and Self-Regulation in Language learning. This study has shown that consistency of interest does have impacts on self-efficacy and self-regulation.

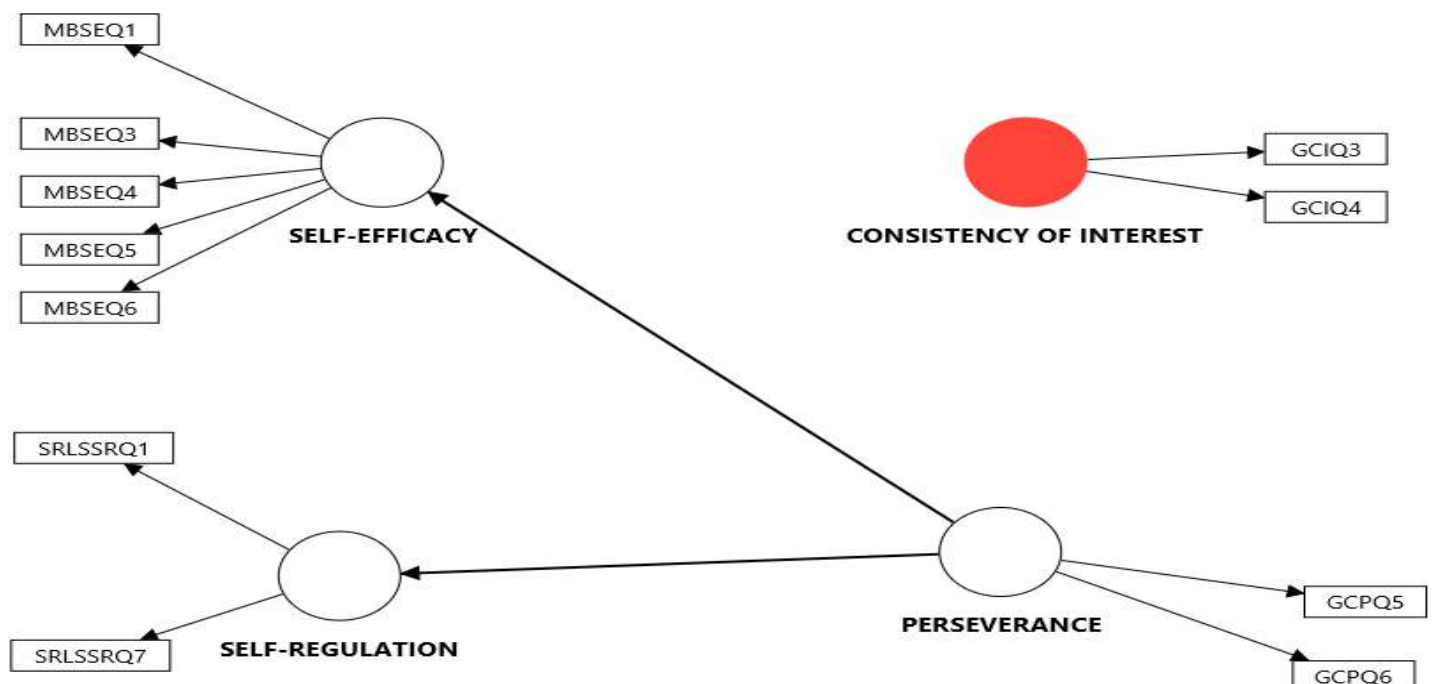


Figure 4 - The Proposed Model for the Influence of Grit on Self-Efficacy and Self-Regulation in Language Learning

The model in Figure 4 was proposed as findings indicated that perseverance significantly predicts self-efficacy and self-regulation in language learning, instead of consistency of interest. This demonstrates the vital role of continuous effort in building confidence and self-learning skill. Instructors should develop activities that encourage perseverance like long term projects. Despite the lesser effect of consistency of interest, encouraging both of these grit components can improve learner interaction. Future research should look into a more diverse sample, try other variables or delve into mix method research design for a more detailed understanding of how grit influences language performance.

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APPENDIX

SURVEY NO 12 A

GRIT,MOTIVATION AND SELF- REGULATED LEARNING

(This instrument is adapted from Martin,et al 2022)

PART	STRATEGY		SCALE	NO OF ITEMS	TOTAL ITEMS
One	Demographic Profile				
Two	Grit		Consistency Of Interest	6	12
			Perseverance	6	
Three	Motivational Beliefs	A	Self-Efficacy	9	22
		B	Intrinsic Value	9	
		C	Test Anxiety	4	
Four	Self-Regulated Learning Strategies	D	Cognitive Strategy Use	13	22
		E	Self-Regulation	9	
	Total No Of Items				44

SURVEY

PART 1-DEMOGRAPHIC PROFILE

Instruction: Please read each statement carefully and tick your answer

Q1.Gender

1	Male
2	Female

Q2 Age Group

1	20 to 29 years old
2	30 to 39 years old
3	40 to 49 years old
4	50 to 59 years old

PART 2- GRIT

1	Never
2	Rarely
3	Sometimes
4	Very Often
5	Always

i. CONSISTENCY OF INTEREST

		1	2	3	4	5
GCIQ 1	I often set a goal but later choose to pursue a different one.					
GCIQ 2	New ideas and new projects sometimes distract me from previous ones.					
GCIQ 3	I become interested in new pursuits every few months.					
GCIQ 4	My interests change from year to year.					
GCIQ 5	I have been obsessed with a certain idea or project for a short time but later lost interest.					
GCIQ 6	I have difficulty maintaining my focus on projects that take more than a few months to complete.					

ii. PERSEVERANCE OF EFFORT

		1	2	3	4	5
GCPQ 1	I have achieved a goal that took years of work.					
GCPQ 2	I have overcome setbacks to conquer an important challenge.					
GCPQ 3	Setbacks don't discourage me.					
GCPQ 4	I finish whatever I begin.					

GCPQ 5	I am a hard worker.					
GCPQ 6	I am diligent.					

PART 2- MOTIVATIONAL BELIEFS (22 items)

i. SELF-EFFICACY

		1	2	3	4	5
MBSEQ1	Compared with other students in this class I expect to do well.					
MBSEQ2	I'm certain I can understand the ideas taught in this course.					
MBSEQ3	I expect to do very well in this class.					
MBSEQ4	Compared with others in this class, I think I'm a good student					
MBSEQ5	I am sure I can do an excellent job on the problems and tasks assigned for this class.					
MBSEQ6	I think I will receive a good grade in this class.					
MBSEQ7	My study skills are excellent compared with others in this class.					
MBSEQ8	Compared with other students in this class I think I know a great deal about the subject.					
MBSEQ9	I know that I will be able to learn the material for this class					

ii. INTRINSIC VALUE

		1	2	3	4	5
MBIVQ1	I prefer class work that is challenging so I can learn new things.					
MBIVQ2	It is important for me to learn what is being taught in this class.					
MBIVQ3	I like what I am learning in this class.					
MBIVQ4	I think I will be able to use what I learn in this class in other classes.					
MBIVQ5	I often choose paper topics I will learn something from even if they require more work.					
MBIVQ6	Even when I do poorly on a test I try to learn from my mistakes.					

MBIVQ7	I think that what I am learning in this class is useful for me to know.					
MBIVQ8	I think that what we are learning in this class is interesting.					
MBIVQ9	Understanding this subject is important to me.					

iii. TEST ANXIETY

		1	2	3	4	5
MBTAQ1	I am so nervous during a test that I cannot remember facts I have learned.					
MBTAQ 2	I have an uneasy, upset feeling when I take a test.					
MBTAQ 3	I worry a great deal about tests.					
MBTAQ 4	When I take a test I think about how poorly I am doing.					

PART 3 - SELF-REGULATED LEARNING STRATEGIES

i. COGNITIVE STRATEGY USE (13 items)

		1	2	3	4	5
SRLSCSUQ1	When I study for a test, I try to put together the information from class and from the book.					
SRLSCSUQ2	When I do homework, I try to remember what the teacher said in class so I can answer the questions correctly.					
SRLSCSUQ3	It is hard for me to decide what the main ideas are in what I read.					
SRLSCSUQ4	When I study, I put important ideas into my own words.					
SRLSCSUQ5	I always try to understand what the teacher is saying even if it doesn't make sense.					
SRLSCSUQ6	When I study for a test, I try to remember as many facts as I can.					
SRLSCSUQ7	When studying, I copy my notes over to help me remember material.					
SRLSCSUQ8	When I study for a test, I practice saying the important facts over and over to myself.					
SRLSCSUQ9	I use what I have learned from old homework assignments and the textbook to do new assignments.					

SRLSCSUQ10	When I am studying a topic, I try to make everything fit together.					
SRLSCSUQ11	When I read material for this class, I say the words over and over to myself to help me remember.					
SRLSCSUQ12	I outline the chapters in my book to help me study.					
SRLSCSUQ13	When reading I try to connect the things I am reading about with what I already know.					

ii. SELF-REGULATION

		1	2	3	4	5
SRLSSRQ1	I ask myself questions to make sure I know the material I have been studying.					
SRLSSRQ2	When work is hard I either give up or study only the easy parts.					
SRLSSRQ3	I work on practice exercises and answer end of chapter questions even when I don't have to.					
SRLSSRQ4	Even when study materials are dull and uninteresting, I keep working until I finish.					
SRLSSRQ5	Before I begin studying, I think about the things I will need to do to learn.					
SRLSSRQ6	I often find that I have been reading for class but don't know what it is all about.					
SRLSSRQ7	I find that when the teacher is talking, I think of other things and don't really listen to what is being said.					
SRLSSRQ8	When I'm reading, I stop once in a while and go over what I have read.					
SRLSSRQ9	I work hard to get a good grade even when I don't like a class.					