



A Path Analysis of Autonomy Supportive Teaching, EFL Learners’ Willingness to Communicate, Self-Regulation, Academic Engagement, and Perceived Locus of Control

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The current study investigated whether autonomy-supportive teaching (AST) could predict EFL learners’ willingness to communicate (WTC), self-regulation (SR), academic engagement (AE), and perceived locus of control (LOC). To this end, 120 intermediate EFL learners were selected based on convenience sampling. To ensure the participants’ familiarity with autonomy supporting strategies, they received instruction based on Reeve’s (2009) model in 18 sessions. Oxford Quick Placement Test, Learning Climate Questionnaire, Willingness to Communicate Questionnaire, Academic Self-regulated Learning Scale, Academic Engagement Questionnaire, and Index of Internal Locus of Control were utilized to gather the data. Partial least squares structural equation modeling (PLS-SEM) was evaluated on path coefficient estimates, t-value, the effect sizes (f2), and the coefficient of determination (R2). The overall model fit SRMR < 0.080 < HI95 supported the postulated model. The f2 values for the weight of the magnitude effect size predicted a significant effect size in the structural model. The results of R2 revealed significant positive paths from AST to SR, AE, WTC, and LOC implying that the observants merged in coalition with each other in a contingent context to predict the viability of autonomy-supportive teaching. Further significant paths were identified from SR to WTC and AE, and from AE and the LOC to WTC. The findings also indicated that AE and SR indirectly influence learners’ WTC via LOC. The study offers theoretical and pedagogical implications to EFL teachers and students.

Keywords: Academic-Engagement, Autonomy-Supportive Teaching, Perceived Locus of Control, Self-Determination Theory, Self-Regulation, Willingness to Communicate

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1. Introduction

Self-determination (SDT), as a theory of motivation, deals with the tendencies inherent in human beings to engage effectively in activities. It highlights the importance of autonomy, competence, and relatedness to an individual's inclination to put effort into doing an activity (Ryan & Deci, 2008). Autonomy implies the feeling of spontaneous willingness to accomplish a task, do an action and complete an undertaking; competence refers to the desire to show one's capacities, and relatedness connotes the need that an individual feels he is connected to others and is a part of the group. SDT propounds that the extent of the satisfaction of these needs results in different types of motivation (Deci & Ryan, 1985, 2000). Deci and Ryan's (1985) self-determination theory underpins the role of motivation as an impetus to set regulations, accomplish tasks, achieve goals, and succeed. They argue that self-determination "is integral to all motivated behaviors" and leads individuals to engage in behaviors, develop competencies, and work on a flexible accommodation with the social environment" (p. 38).

Much affected by SDT, perceived locus of control (PLOC) deals with how people process and interpret the causes of their success and failure (Jarvis, 2005). The main loci of attribution sways between two extremes, i.e. internal or external locus of control. Learners with an internal LOC attribute their achievement and success to their effort while those with external LOC accord their success or failure to the situation, they are involved in. According to Deci and Ryan (2000), when learners assign their failure or success to their endeavor, they turn out to be considerably motivated. SDT suggests that when an individual, shows more internal PLOC for a typical behavior, a greater attempt will be exerted and consequently higher satisfaction would be achieved while acting (Deci & Ryan, 2000). However, little research has surveyed the possible mechanisms for such associations concerning psychological variables such as self-efficacy.

Incited by STD, self-regulation or self-determination extent to which students perceive their achievement as being self-initiated and not controlled by others (Duchatelet & Donche, 2019). It is defined as one's confidence in his/her ability to organize his/her tasks, arrange the encountered challenges, and promote the quality of classroom environments. In the light of STD, self-regulation is rooted in one's capacity to arrange and implement the courses prerequisite to organizing and controlling the prospective circumstances (Wang, 2016). From this perspective, self-autonomy offers a higher estimate of the accomplishments and increases motivation. Intrinsic motivation is the most autonomous and self-determined form of behavior and is completely integrated and internalized in the process of learning by individuals (Duchatelet & Donche, 2019).

As much influenced by STD, willingness to communicate, as defined by MacIntyre et al. (1998), denotes learners' desire to communicate and the readiness to arrive at discourse with other individuals using L2. Communication plays a crucial role to L2 learners since they can negotiate meaning with other interlocutors through the process of interacting, which consequently facilitates acquisition due to the sufficient provision of linguistic feedback. The desire to enter a conversation or keep being reticent is highly affected by the individuals' motivation, which can be traced back to STD's doctrines in the role of motivation in experiencing volition in arriving into a specific conversation (Reeve, 2012).

Affected by STD, Hiver et al. (2021) postulated that students' academic engagement is entwined with their learning success and achievement, primarily attributable to emotional and behavioral motivations leading to more cognitive engagement to learn the materials. As Reeve (2013) claimed, student academic engagement, as a multifaceted concept involves a variety of emotional and cognitive factors that contribute to the demonstration of positive motivation toward the learning process.

Teachers' ability to support learners' autonomy plays an important role in motivating learning (Wang et al., 2016). If teachers' behavior nurtures the internal inspiring assets, employing no-controlling speech, and appreciating the students' viewpoint and affection, it is considered to be highly autonomy-enhancing (Reeve, 2009). When instructors support their learners' autonomy, they feel positive about their attempt to improve and consequently take part more in the learning procedure. Therefore, developing autonomy-supportive teaching is crucial since it promotes learning outcomes, expands their involvement in learning tasks, motivation to continue, self-enterprising, and optimistic feelings (Reeve, 2009).

Despite the growing body of research on willingness to communicate, self-regulation, and academic engagement, there is still a need to investigate these variables as affected by the autonomy supporting teaching from an SDT perspective. The review of the pertinent literature unveiled the paucity of STD-based research that zoom on the causal interplay among the AST, WTC, SRL, AE, and PLOC to assess all paths in a matrix of subcomponent correlations. To fill the gap, using the SDT framework, autonomy supporting teaching was nominated to be studied as the teachers' practice plays an eminent role in motivating learners to engage in the class activities, communicate in the classroom, and regulate their studies. This study can be among the pioneers since in the previous research, not all these variables have been examined in a single plot employing structural equation modeling (SEM). The purpose of the study is to provide more insight into how these variables may interact and influence each other in a way to leads to higher qualified development and learning. Thus, the present study suggested a

hypothesized model through the application of SEM to investigate the causal relationships among the above-mentioned variables and their subscales in association with STD. The topic gains more credit when it comes to the fact that the present educational conditions are highly affected by corona and mostly all academic contexts have turned to virtual classes in which autonomous learning becomes a crucial factor in students' willingness to communicate, and academic engagement and achievement. The present study tried to investigate autonomy-supportive climate as an independent variable that affects individual variables of WTC, self-regulation, academic engagement, and PLOC in a multivariant interrelated network. Consistent with the purposes of current research that test the proposed model, the following research question is proposed:

Does EFL teachers' autonomy-supportive teaching predict EFL learners' willingness to communicate, self-regulation, academic engagement, and perceived locus of control?

2. Literature Review

2.1. Theoretical Framework

A comprehensive theory of human motivation is pictured by Deci and Ryan's (2002) Self-Determination theory which proposed that all learners are bestowed with inherent tendencies, motivational resources, and psychological desires that can be flourished or frustrated by the classroom conditions (Deci & Ryan, 1991; Ryan & Deci, 2002). These inner motivational resources, namely, autonomy, competence, and relatedness (Deci & Ryan, 2000) motivate learners to engage in the classroom environment to express themselves and fulfill the aforementioned desires. They postulate that whenever all of these mental and psychological resources are fulfilled, students' self-inspiration, achievement, and success are enhanced. The theory assumes that learners are constantly in an active collaboration with their classroom setting calling constantly for supportive approval to nurture these inner motivational resources. If these inner resources are overpassed or neglected, the learners' motivation, and consequently their collaboration, and engagement will accordingly flounder. Autonomy-supportive motivating style is one way to nurture these inner resources through facilitating the congruence between learners' self-determined inner motivation and their routine classroom tasks and activities by recognizing and nurturing learners' interests, needs, and preferences and by creating opportunities inside the classroom to have these internal statuses control and guide their behavior. The rationale for selecting the SDT as the framework of the present study lies in its doctrines than consider both human beings' basic inner psychological needs and environments interactively. What happened in this study was finding the causal path between teaching autonomy support in the class on

one hand and motivationally-affected variables such as SR, AE, WTC, and PLOC on the other hand.

2.2. Practical Studies

Based on this dynamic interactional dialect, learners' inner motivation and the classroom's surroundings influence each other interactively (Reeve et al., 2004). Learners hold inherent tendencies, motivation, and needs to pursue their goals, undertake their learning processes, and engage in their chore and classroom surroundings that, in turn, provide a range of potencies that influence learners' motivations and impetuses to longer-lasting motivational growth. Reciprocally, learners voice their inner motivational resources to take part in the learning tasks and activities and classroom challenges. The classroom atmosphere, in its turn, either fosters or frustrates learners' appearance of inner motivation. The controlling and demotivating classroom environments suppress learners' motivation to engage in classroom activities and be willing to communicate in the classroom tasks, leading to less optimal outcomes, external rather than self-regulation, and disengagement. Typically, autonomy-supportive teachers buttress learners' autonomous strivings and their self-determined inner tendencies by producing classroom opportunities for them to get these internal resources to direct their behavior.

Supporting and reinforcing these inner motivational resources lead to an evocative range of positive educational consequences, including greater self-regulation (Duchatelet et al., 2019; Wang et al., 2016), higher motivation (Dincer & Yesilyurt, 2017; Ryan, 2017), willingness to communicate (Jo et al, 2017; Fallah, 2014), greater academic engagement (Assor et al., 2012; Dimcer, 2019; Noels, 2016; Reeve et al., 2004), higher intrinsic motivation (Reeve et al., 2003; Kaur et al., 2015), and better academic performance and engagement (Chen, 2015). In an attempt to unveil the relationship among learners' willingness to communicate, learners' attitudes toward autonomy-supportive teaching, self-efficacy, and motivation, Karimi and Abaszadeh (2017) conducted a study the result of which unveiled a significant path from learners' motivation to autonomy-supportive instruction, self-efficacy, and WTC. Further paths were detected from self-efficacy to motivation and willingness to communicate. it was also found that learners' motivation could be indirectly predicted by autonomy-supportive teaching through the intervening role of self-efficacy.

Self-Determination Theory is among the comprehensive motivational paradigm that adopts a comprehensive approach to motivation (Ryan & Deci, 2017). SDT (Deci & Ryan, 1985) suggests that the extent and the nature of engagement stem from the individuals' intuitive psychological requirements for autonomy (the feeling of being self-initiating and self-governed in doing tasks), competence (the state of being resourceful and competent), and

relatedness (the perception of being allied with others emotionally). Once these psychological desires are satisfied via communications with other individuals, they probably become more involved in doing other activities. Learners' psychological wants are influenced by the features of student-teacher correspondence and the climate of the classroom (Black & Deci, 2000; Dincer et al., 2019; Noels et al., 2019; Reeve, 2012). Reeve et al. (2003) worked on a model of perceived self-determination in intrinsic motivation, internal locus of control, perceived choice, and volition. Their results supported the hypothesized model in which the internal locus of control and volition established valid indicators of self-determination while the perceived choice of control did not yield any progress. In light of their findings, they proposed a revised version of perceived self-determination and discussed the conditions under which teachers can increase students' intrinsic motivation and modify perceived locus of control.

Grounded in self-determination theory, Dincer et al. (2019) investigated the relationship among the perceived autonomy-support, emotional, achievement, psychological requirements, agentic, behavioral, absenteeism, and cognitive engagement. The results confirmed the hypothesized model was supported and it was found that students' needs were predicted by the teacher's autonomy support, which likely predicted engagement in turn. Besides, absenteeism and achievement predicted engagement. The interviews also supported the same path that the students who thought that their engagement was supported in an encouraging social climate had higher achievement.

Consistent with Deci and Ryan's (1985) SDT theory, Khajavi et al. (2016) studied the relationships among EFL learners' confidence, WTC in English, attitudes, English language achievement, classroom environment, and motivation based on the STD. The results revealed that communication confidence directly influenced WTC; classroom environment was the main predictor of L2WTC; motivation influenced WTC indirectly via communication confidence; English language proficiency influenced WTC via communication confidence indirectly; and the classroom environment directly influenced motivation, attitudes, and communication confidence.

Although there are abundant pieces of documents recording the effect of autonomous teaching (Dincer et al., 2012; Noels, 2015; Oga-Baldwin & Nakata, 2015), few studies take up a multivariate outlook to inspect the interplay among multiple paths of the autonomy-supporting teaching, self-regulation, academic engagement and perceived locus of control in the light of STD framework. Most of them examined bivariate correlations among these constructs. Given its size and significance, it was significant to place a multivariate study in a larger motivational paradigm, i.e. STD (Jang, 2016; Ryan & Deci, 2017). To fill the gap and provide a supplement to the

multivariate perspective, the present study worked on the complicated causal relationship among teaching context (autonomy-teaching support), self-process (self-regulation), academic engagement, and perceived locus of control in the light of STD theory.

2.3. Hypothesized Model

Contingent on the knowledge of the theory as well as empirical studies, the present study suggested a hypothesized structural equation model examine the causal interrelationships among AST, SRL, WTC, and PLOC. Following Ryan & Deci (2017) we hypothesized that AST directly affects SRL, AE, WTC, and PLOC. Therefore, four paths from AST to SRL, AE, WTC, and PLOC were hypothesized. Consistent with the SDT theory (Deci & Ryan, 2002) and previous empirical studies on the effect of AST (Duchatelet & Donche, 2019), a path from autonomy-supporting teaching to self-regulation was hypothesized.

Supported by pertinent studies on the effect of supportive teaching on students' WTC in L2 and engagement (Assor et al., 2012; Dimcer, 2019; Fallah, 2014; Jo et al, 2017; Noels, 2016; Reeve et al., 2004), a path was delineated from autonomy-supportive teaching to learners' academic engagement and WTC.

Additionally, preceding studies recorded the significant role of autonomy-supported teaching in predicting the Internal Locus of Control (Aghayani, 2021; Aghayani & Hajmohammadi, 2019). Consequently, a path was added up from AST to PLOC and WTC.

The previous studies also documented the positive changes in learners' academic engagement due to their self-regulation (Davoudi, 2011; Montazeri, 2017) and resulted in hypothesizing another path from students' self-regulation to their academic engagement. The evidence provided from the literature supported the effect of academic engagement on learners' WTC and PLOC (Khajavi et al., 2016; Mystkowska-Wiertelak, 2021), helping the researchers to hypothesize another path from academic engagement to WTC and PLOC. The hypothesized model is shown in Figure 1.

3. Method

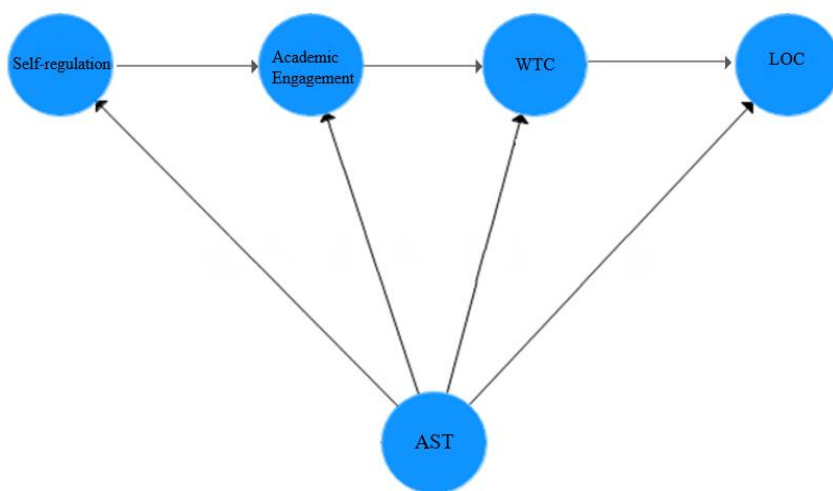
3.1. Participants

One hundred and twenty EFL intermediate learners including 72 females (60 %) and 48 males (40%) with an age range from 22 to 26 years old ($M=20.12$, $SD= 4.19$) were selected based on convenience sampling from five branches of a language institute in Alborz. The proficiency level of the participants was homogenized through OPT to equipoise its effect on the other variables. The rationale for selecting the participants from among

English private institutes was that speaking is not among the primary purpose of the Iranian educational system, and the opportunity to speak and communicate in English is too meager in the classes while in private classes the main focus is to develop the communicative speaking skills which were in line with the purpose of the study. The participants' proficiency level was also decided to be intermediate so that the learners' language level would not be a factor in impeding their willingness to communicate in the classroom.

Figure 1

The Hypothesized Model



3.2. Materials and Instruments

Regarding the purpose of the present research, the following instruments were utilized: Oxford Quick Placement Test, The Learning Climate Questionnaire (LCQ), Willingness to Communicate (WTC) Questionnaire, Scale of Academic Self-regulated Learning (A-SRL-S) Academic Engagement Questionnaire, in addition to Index of Internal Locus of Control.

3.2.1. Oxford Quick Placement Test

It was utilized to ascertain the homogeneity of the participants regarding their English language proficiency. This placement test includes 60 multiple-choice items *measuring the* participants' English language

knowledge about prepositions, usage, and vocabulary through fill-in-the-blank items and cloze passages.

3.2.2. Willingness to Communicate (WTC) Questionnaire

To measure the participants' WTC, Khatib and Nourzadeh's (2015) Willingness to Communicate (WTC) Questionnaire was used. It is a 27 five-point Likert-style items encompassing six sub-factors, namely, encompassing communicative self-confidence (5 items), integrative orientation (5 items), the situational context of L2 use (4 items), topical enticement (4 items), learning responsibility (4 items), and off-instruction communication (5 items). The items range rated from; 'would rather avoid' to 'very much willing to'. (e.g., *speak even if other students laugh at your language mistakes*). The questionnaire shows Cronbach's alpha of about .94, which was a high internal consistency.

3.2.3. Academic Self-Regulated Learning Scale (A-SRL-S)

Developed by Magno (2010), this questionnaire was exploited to measure students' academic self-regulation. It contains 54 items using a five-point Likert scale, ranging from 'Strongly Agree' to 'Strongly disagree.' The loaded factors in this instrument were strategy of memory (14 items), determining goal (5 items), self-evaluation (12 items), looking for help (8 items), setting of the surroundings (5 items), management of learning (5 items), and arranging and planning (5 items). (e.g., *I use note cards to write information I need to remember*). Cronbach Alpha was run to ensure the reliability, and it was reported to be .79 indicating a high-reliability index.

3.2.4. Academic Engagement Questionnaire

It was developed by Reeve and Tseng (2011) and included 22 items based on a 7-point Likert scale ranging from *strongly disagree* to *strongly agree* was employed. The questionnaire measures four sub-category variables including agency (5 items), behavioral (5 items), emotional (4 items), and cognitive in learners' behavioral engagement (8 items) (e.g., *When doing schoolwork, I try to relate what I'm learning to what I already know*). In addition, Cronbach's alpha coefficient of the questionnaire has been calculated to be 0.93.

3.2.5. The Learning Climate Questionnaire (LCQ)

Concerning measuring teachers' autonomy support in the classroom, a 15-item Likert scale questionnaire, *The Learning Climate Questionnaire (LCQ)*, developed by Williams and Deci (1996) was utilized. Being measured on a 7-point Likert scale ranging from strongly disagree to strongly agree, the items loaded on intrinsic or identified autonomy and introjected or controlled. Higher average scores denote a higher degree of perceived autonomy support

(e.g., *I feel that my instructor provides me choices and options*). The questionnaire had Cronbach's alphas above 0.97, indicating high internal consistency.

3.2.5. Internal Locus of Control Index

Duttweiler's (1984) Internal Control Index (ICI) was employed to measure the internal or external locality of the participants. There are two factors in the ICI questionnaire, namely self-confidence, and autonomous behavior (Duttweiler, 1894) loaded on eight eigenvalues, namely the need to be encouraged (10 items), Reliance on one's attitude (5 items), Effort to reach desirable goals (2 items), Self-expression (2 items), Interest in administrative jobs (3 items), Undecidedness (3 items), The need to consult for making decisions (2 items), and Being responsible for desirable events (1 item). The 28-item questionnaire intends to measure where an individual seeks out or assumes the support. Those with an external locus of control look for the source of reinforcement in chance or luck, whereas the ones with an internal locus of control individual pursue reinforcement in their behavior. The 5-point Likert scale questionnaire ranges from rarely (less than 10% of the time) to usually (more than 90% of the time and each one of the items). The range of scores was between 28 and 140 with those higher than or equal to 127 clustered as Internal Locus of control and those with less than 127 were grouped as External Locus of control. Cronbach's alpha was found to be .98 revealing high internal consistency (e.g., *I need frequent encouragement from others for me to keep working at a difficult task*).

3.3. Procedure

To conduct the study, first, a pilot study was conducted with 30 EFL learners to confirm the reliability of the instruments. For ethical consideration, approval from institutions and informed consent from the participants were collected. The participants were homogenized according to proficiency via OPT. Before the onset of the study, the participants completed the Learning Climate Questionnaire, Willingness to Communicate (WTC) Questionnaire, Self-Regulation Scale, Academic-Engagement Questionnaire, and Internal Locus of Control Scale. The strategies that were selected to be taught in 18 sessions aimed to nurture the inner motivational resources, incorporating students' perspectives, allowing time and opportunities for the students to talk, displaying patience for self-paced learning, discussing plans, and setting goals at the outset of the class, explaining the rationale and worth of learning, using non-controlling language through hints and efforts, using the problem-solving method, reinforcing main teaching points, maintaining a friendly teacher-student relationship, offering opportunities and alternatives, discussing and taking students' perspectives on different methods of listening teaching (top-down

or bottom-up), scaffold learning via timely informational feedback, providing teaching cues for content replication and clarification, acknowledging students' voices, preparing opportunities for student's participation in the setting of the goals/objectives, highlighting the significance of doing a specific activity, offering constant feedback with encouraging words, encouraging taking roles and responsibility for their learning, allowing interpersonal involvement, encouraging the learners to have their note cards, employing graphic organizers, preparing an outline, keeping a summary draft, having a planner to keep track of what had been taught, stimulating various learning styles by utilizing a variety of tasks, encouraging the learners to have self-evaluation, encouraging them to seek assistance whenever needed, which were based on Reeve's (2009) five actions of teaching behavior. These actions were "(1) providing alternatives and possibilities, (2) offering feedback using informative, not controlling language, (3) presenting explanatory rationales, (4) giving time so that self-paced learning occurs (5) appreciating what learners express as negative impact" (p.45). The fundamental precept was the involvement of the learners in making decisions during the course through discussing the alternatives, topics, grammatical points, and finding solutions to the emerged problems to support their autonomy. The solutions were not given to the learners immediately but they were offered after discussing the answers through negotiations with the teacher or the peers. However, they were meticulously monitored by the instructor and they were provided with feedback whenever required. Finally, the participants filled out the questionnaires in the last session.

3.4. Data Analysis

The data were subject to Partial Least Squares based Structural Equation Modeling (PLS-SEM) using Smart PLS software to test the hypothesized model and the complex causal relationships. The rationale behind exploiting this statistic lies in its power to predict complex causal estimations among the multifarious constructs, sub-constructs, indicator variables, and numerous items (Hair et al., 2017). Moreover, PLS-SEM works with small sample sizes (in this study 120) and demonstrates higher robustness in these conditions (Sarstedt et al., 2016). Convergent validity (CV), discriminant validity (DV), composite reliability (CR), and average variance extracted (AVE) were calculated. In evaluating the structural model, the path coefficient estimates (PCEs), the fit of the estimated model (*SRMR*), their significance levels, coefficient of determination (R^2), and the effect sizes (f^2), were examined.

4. Results and Discussion

4. Results

The results of both measurement and structural models are presented below.

4.1. Assessment of the Measurement Model

It was measured through convergent and discriminant validity as well as reliability. The first Indicator R covered the assessment of the loading of the indicators, composite reliability (CR), and Cronbach's alpha (α). Convergent validity was measured by average variance extracted (AVE) and discriminant validity was evaluated through the Fornell-Larcker criterion (Benitez et al., 2020).

4.1.1. Reliability

Indicator loadings, and composite reliability (CR), and Cronbach's alpha (α) were calculated first. The loading factor for all the variables was greater than 0.4, which was the acceptable value of the indicator loadings (Kline, 2011) (Fig.1). Table 1 displays the Cronbach's alpha reliability indices for the WTC and its six components. The reliability index for overall WTC was .948. The reliability indices for the six sub-skills were as follows; communicative self-confidence ($\alpha = .773$), integrative orientation ($\alpha = .803$), situational context of L2 use ($\alpha = .773$), topical enticement ($\alpha = .718$), learning responsibility ($\alpha = .730$), and off-instruction communication ($\alpha = .754$). Since these reliability indices are higher than .70, they can be considered 'appropriate' reliability indices (Dörnyei & Taguchi 2009). Based on the classification made by George and Mallery (2020), the reliability indices for WTC and its sub-skills can be considered as 'appropriate'; ($> = .70$), 'good' ($> = .80$), and 'excellent' ($> = .90$). The overall academic engagement enjoyed an excellent reliability index of .930. The reliability indices for the four sub-skills were as follows; agentic ($\alpha = .755$), behavioral ($\alpha = .725$), emotional ($\alpha = .726$), and cognitive ($\alpha = .819$). The overall perceived locus of control enjoyed an excellent reliability index of .944. The reliability indices for the two sub-skills were as follows; self-confidence ($\alpha = .844$), and autonomous behavior ($\alpha = .885$). The reliability index for overall self-regulation was .971, which is considered an excellent one. The reliability indices for its sub-skills were as follows; strategy memory ($\alpha = .891$), determining goal ($\alpha = .794$), self-evaluation ($\alpha = .880$), looking for help ($\alpha = .833$), setting for surrounding ($\alpha = .787$), management of learning ($\alpha = .763$), and arranging and planning ($\alpha = .728$). Based on the classification discussed earlier, these reliability indices ranged from appropriate to excellent.

The reliability index for overall autonomous strategy perception was .970, which is considered an excellent one. The reliability indices for its sub-

skills were as follows; intrinsic or identified autonomy ($\alpha = .891$), introjected or controlled ($\alpha = .794$) showing a high-reliability index. Table 1 shows the Cronbach's Alpha Reliability and Composite Reliability Indices of the variables.

Table 1

Cronbach's Alpha Reliability and Composite Reliability Indices, and AVE Values

	α	CR	AVE	Bias	2.5%	97.5%
WTC	.948	.956	.784	0.000	1.000	1.000
AE	.930	.947	.818	-0.002	0.920	0.964
LOC	.980	.972	.976	-0.001	0.951	0.982
SR	.971	.972	.834	-0.001	0.961	0.980
LCQ (AST)	.970	1.000	.899	-0.001	0.937	0.968

The exploratory factor analysis was also run on the items to compute composite reliability (CR) indices and average variance extracted (AV). The CR and AV indices were computed for the sub-skills of the four questionnaires through the PLS-SEM model. Figure 2 displays the PLS-SEM model for autonomy-supportive teaching (AST), willingness to communicate (WTC), self-regulation (SR), academic engagement (AE), and perceived locus of control (LOC).

Table 1 also displays the CR indices for AE, LOC, SR, and WTC. Before discussing the results, it should be noted that CR refers to the reliability of the scale. The composite reliability indices for the AE, LOC, SR, and WTC were; .947, .972, .972, and .956. An acceptable CR should be at least .70 (Garson 2016, Hair et al. 2017). Based on these results it can be concluded that the four constructs enjoyed appropriate CR indices. The CR was not computed for LOC that had only two indicators (observed variables) (Table 1).

4.1.2. Convergent Validity

As the second index, CV was computed by assessing AVE between per latent variable and the indicators. Table 6 displays the average variance extracted (AVE) or convergent validity indices for AE, LOC, SR, and WTC. An instrument enjoys appropriate convergent validity if it measures what it is supposed to measure. An appropriate AVE should be equal to or higher than .50 (Garson, 2016). The results showed that AE, LOC, SR, and WTC enjoyed appropriate AVE indices of .818, .976, .834, and .784 respectively (Table 1).

Figure 2

Partial Least Square Model of Autonomous-Supportive Teaching (Main Indicators plus Components)

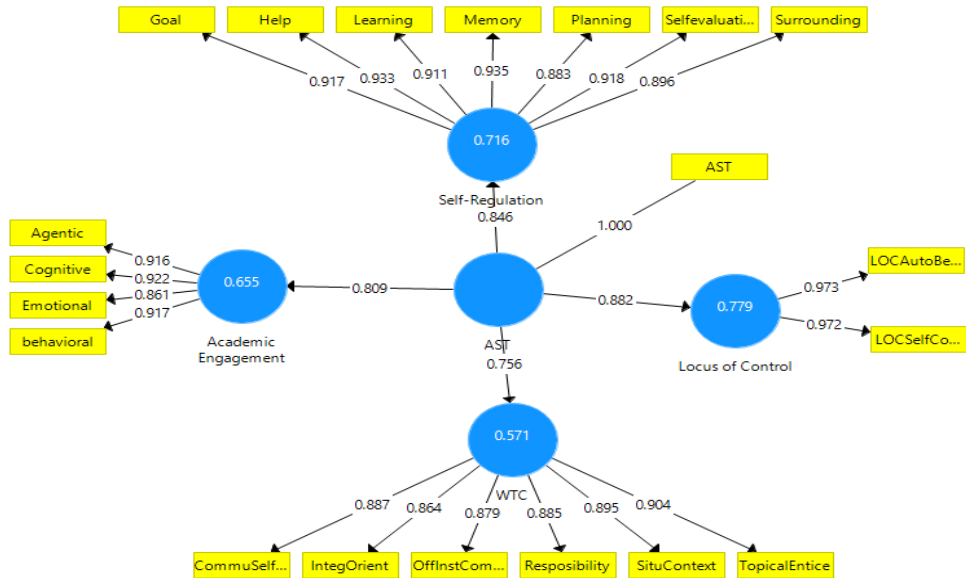


Table 2
Heterotrait Monotrait Ratio

	HTMT	Mean	2.5%	97.5%
Academic Engagement -> LCQ (AST)	0.835	0.827	0.658	0.944
Locus of Control -> LCQ (AST)	0.909	0.906	0.825	0.971
Locus of Control -> Academic Engagement	0.673	0.660	0.417	0.842
Self-Regulation -> LCQ (AST)	0.858	0.849	0.699	0.965
Self-Regulation -> Academic Engagement	0.677	0.663	0.377	0.886
Self-Regulation -> Locus of Control	0.709	0.697	0.421	0.929
WTC -> LCQ (AST)	0.776	0.781	0.673	0.877
WTC -> Academic Engagement	0.425	0.431	0.160	0.717
WTC -> Locus of Control	0.626	0.630	0.391	0.837
WTC -> Self-Regulation	0.486	0.482	0.232	0.737

4.1.3. Discriminant Validity

Discriminant validity intends to confirm whether the latent variables are theoretically and statistically different enough (Benitez, 2020). The empirical evidence is established through Heterotrait Monotrait ratios (HTMT) with an acceptable threshold equal to or lower than 0.85 (strong) or 0.90 (more lenient) or significantly less than 1 (Garson, 2016). As displayed in Table 2, all HTMT indices were equal to or lower than .90 which is considered an appropriate index of divergent validity except for the relationship between LOC and AST, which had an HTMT index of .909.

4.2. The Assessment of the Structural Model (SM)

In assessing the SM, the total fit of the estimated model, the PCE as well as the pertinent t-values, the f^2 , and the R^2 are supposed to be examined. The path coefficient is significant at a 95% level of confidence once the observed t-values corresponds 1.96 (Benitez, 2020).

4.2.1. The Evaluation of the Overall Measure of Fit

SRMR was used to measure the variance between the statistical IV matrix and the postulated model. If SRMR is lower than 0.080, adequate model fit is accepted. In this study, the SRMR was below the suggested point of 0.080, signifying that the IV matrix fits to the postulated model. Henceforth, the empirical evidence confirms the model fit estimations as they were less than 95% of their equivalent distributions. This advocates that the proposed model is appropriate for justifying the growth of SR, WTC, LOC, and AE (Table 3).

Table 3 shows that all values of discrepancy measures were below the 95% quantile of their corresponding reference distribution (HI95), which indicates that the estimated model was not rejected at a 5% significance level (dULS, & dG) ($SRMR < 0.080$ $SRMR < HI95$). Table 4 shows the correlation matrix of the constructs.

Table 3
Evaluation of the Overall Fit of the Estimated Model

Discrepancy	Overall saturated model fit evaluation		
	Value	HI95	Conclusion
SRMR	0.040	0.049	Supported
dULS	0.310	0.546	Supported
dG	0.045	0.221	Supported

Table 4
Construct Correlation Matrix

	LCQ (AST)	WTC	SR	AE	LOC
LCQ (AST)	.90*				
AE	.86*	.89*			
LOC	.79*	.75*	.74*		
SR	.73*	.71*	.67*	.69*	
WTC	.64*	.62*	.60	.58*	.55*

Table 5
Standardized Regression Coefficients Values (Path Analysis)

	Path coefficient	Mean	SD	t-value	p Values
LCQ (AST) <- AST	1.00	1.00	0.00	50.00	0.00
Agentic <- Academic Engagement	0.91	0.91	0.01	50.93	0.00
Cognitive <- Academic Engagement	0.92	0.92	0.01	57.33	0.00
Emotional <- Academic Engagement	0.86	0.85	0.04	19.01	0.00
behavioral <- Academic Engagement	0.91	0.91	0.02	41.01	0.00
CommuSelfConf <- WTC	0.88	0.88	0.02	34.69	0.00
IntegOrient <- WTC	0.86	0.86	0.02	29.34	0.00
OffInstCommu <- WTC	0.87	0.87	0.03	25.21	0.000
Responsibility <- WTC	0.88	0.88	0.02	32.15	0.00
SituContext <- WTC	0.89	0.89	0.02	37.02	0.00
TopicalEntice <- WTC	0.90	0.90	0.02	33.77	0.00
Goal <- Self-Regulation	0.91	0.91	0.02	37.16	0.00
Help <- Self-Regulation	0.93	0.93	0.01	55.97	0.00
Learning <- Self-Regulation	0.91	0.90	0.02	40.60	0.00
Memory <- Self-Regulation	0.93	0.93	0.01	51.91	0.00
Planning <- Self-Regulation	0.88	0.88	0.03	28.67	0.00
Selfevaluation <- Self-Regulation	0.91	0.91	0.02	45.91	0.00
Surrounding <- Self-Regulation	0.89	0.89	0.03	27.99	0.00
LOCAutoBehavior <- Locus of Control	0.97	0.97	0.00	142.4	0.000
LOCSelfConfidence <- Locus of Control	0.972	0.97	0.00	127.8	0.000

Table 6 displays the path coefficient and the t-values of the constructs (indicators) for the PLS-SEM model displayed in Figure 1.

4.2.2. Evaluation of Path Coefficients and their Significance Levels

PCEs are standardized regression coefficients (Beta), the absolute size and sign of which were measured consequently. It is statistically significant at a 5% with p-value lower than 0.05. Table 10 presents the PCEs for the hypothesized causal relationships that varied from 0.96 to .97. The results confirmed the significant effect of an independent variable on dependent variables. Table 5 displays the standardized regression coefficients values following the contribution each indicator (observed variable) has to its construct.

Table 6
Structural Model Evaluation; Contributions of Constructs to Autonomous Supportive Teaching

	Path coefficient	Mean	SD	t-value	p-Values	f ²	R ²
LCQ (AST) -> Academic Engagement	0.80	0.80	0.06	11.92	0.00	0.25	0.398
LCQ (AST) -> Locus of Control	0.88	0.87	0.03	23.62	0.00	0.26	0.407
LCQ (AST) -> Self-Regulation	0.84	0.83	0.06	12.95	0.00	0.36	0.432
LCQ (AST) -> WTC	0.75	0.76	0.04	16.31	0.000	0.35	0.405

4.2.3 Evaluation of Effect Sizes

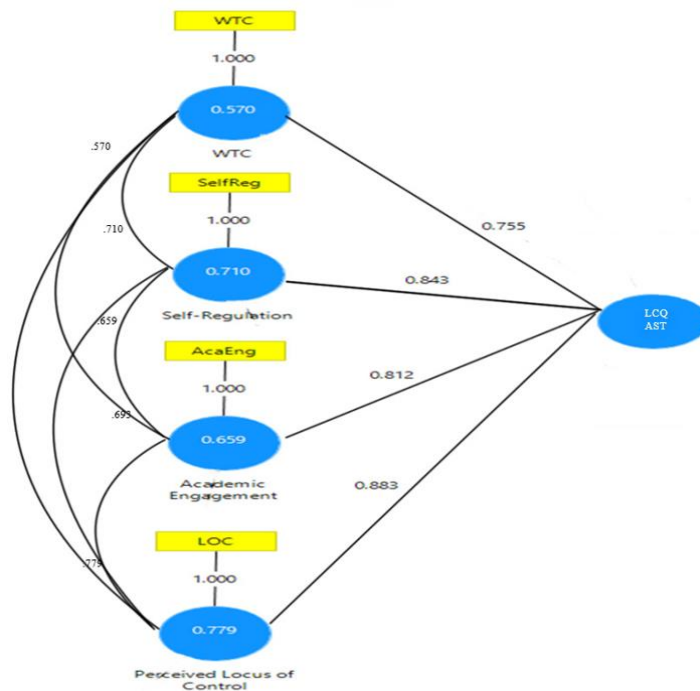
The effect size indicates the measure of the size of an effect irrespective of the size of the sample. Not all constructs assume the same magnitude effect size in the model just as not all movie actors play the leading role. The f^2 value that fluctuates from 0.020 to 0.150, indicates weak size, while 0.150 to 0.350, signifies medium, and larger or equal to 0.370, implies large effect size correspondingly (Kock & Hadaya, 2018). In this sample, the values of the f^2 vary from .250 to .368 that implies a significant effect size of the pertinent constructs in the structural model.

4.2.4. Evaluation of R2

In this study, the R^2 values corresponds .443, .432, .405, 398, and 0.407 that are excellent values (Chin, 1998). The strength of the nominated variance (predictors) among the constructs confirmed the satisfactory prediction amongst the constructs. Figure 3 displays the PLS-SEM model for the four main constructs and their contributions to LCQ (AST). The standardized regression coefficients (Beta) indices are displayed in Table 5. The CR, AVE, and HTMT indices could not be computed for this model; because each construct had a single indicator.

Figure 3

Partial Least Square Model of Autonomous-Supportive Teaching and its Four Main Indicators



The last figure represents the path among the indicators and the observants. The emerged path coefficients exposed positive paths from LCQ (AST) to WTC, SR, AE, and LOC suggesting the causal interplay among the constructs and the components merged in alliance with each other in the context of prediction. Significant paths were detected from SR to WTC, and from AE and the LOC to WTC. The findings also indicated that AE and SR could influence students' WTC through LOC.

4.3. Discussion

Employing PLS-SEM analysis, the study assessed the measurement models and structural models in the theoretical framework of the causal relationship between the constructs and the indicators. The overall saturated model fit, composite reliability (CR), SRMR, convergent validity, discriminant validity, and indicator reliability were evaluated. In evaluating the structural model, path coefficient estimates, effect size (F^2), t-value, and coefficient of determination (R^2) were examined. As mentioned earlier, when the t-values are higher than 1.96, the path coefficient is significant at a 95% level of confidence revealing a significant path among the hypothesized model. Thus, the analysis of PLS-SEM models unveiled the strong prediction of SR ($p < .443$), with the t-values related to WTC ($p < .405$), AE ($p < .398$), and LOC ($p < .407$) at 95 % confidence.

The model explained the efficacy of the loading on all constructs and indicators with .443, .432, .405, .398, and 0.407 of the variances, confirming that the four constructs included AE, LOC, SR, and WTC enjoyed appropriate CR indices. The convergent validity indices for AE, LOC, SR, and WTC with .818, .976, .834, and .784, respectively, authorized the appropriacy of all indices. HTML indices were lower than .90 which is considered an appropriate index of divergent validity approving non-relevant measured constructs. The path coefficient values revealed that the four indicators measuring academic engagement (AE), the six indicators measuring willingness to communicate (WTC), the seven indicators measuring self-regulation (SR), and finally, the two indicators of locus of control (LOC), all had significant contributions to their constructs. Regarding the results of standardized regression coefficients (Beta), it was discovered that academic engagement (AE), locus of control (LOC), self-regulation (SR), and willingness to communicate (WTC) had a significant contribution to AST. The results are supported by Darasawang and Reinders, (2021) as they documented that within the self-determination perspective, students need to have the autonomy to feel motivated. Taking this into consideration, teachers may be able to promote their learners' autonomy at different phases of their teaching by empowering them to make decisions in the tasks they are

performing, creating a sense of belonging to a group to create relatedness, and scaffolding all individuals within each group to enable them to overcome their lack of competence.

The results are consistent with the relevance of AST and academic engagement found in the previous findings (Dincer, 2012, 2019; Ryan & Deci, 2000; Reeve & Tseng, 2011). Academically engaged language learners, in line with the findings of Reeve (2012), take an architect role in shaping their learning and motivation bringing off higher achievement. Arising students' awareness of the autonomous learning strategies leads to a higher willingness to participate in academic activities (Khajavi et al., 2016). Similar results were found by Karimi and Abaszadeh (2017) who found that characteristics of instructional settings contribute to EFL learners' academic engagement and influentially affected their WTC. The point that the teachers can facilitate learners' engagement and WTC through catering to an autonomy-supportive environment and considering the principles of SR, the hypothesized path was found to be supported by Wang et al. (2016), Fallah (2014), and Joe et al. (2017). As a theory of human motivation, SDT, autonomy-supportive intervention trigger EFL learners' intrinsic and autonomous motivation, encouraging them to be more willing to participate in classroom activities (Deci & Ryan, 2002). The significant path from autonomy-supportive teaching to the locus of control was in line with the self-determination theoreticians' claim about the positive effects of a supportive atmosphere on learners' motivation (Fallah, 2014; Karimi & Abaszadeh, 2017). The structural model of the study documented the stimulation of the participants' WTC and AE through AST and SR in EFL contexts (Fallah, 2014; Wang et al., 2016), suggesting that supplying EFL learners with a sense of self-fulfillment through autonomous- supportive teaching would be among the predicting factor of their motivation to participate more in the process of learning (Karimi & Abaszadeh, 2017). Consistent with the findings, Joe et al. (2017) indicated that the classroom climate significantly predicted the learners' rudimentary psychological requirements by supporting their learning and success. The positive direct path loading from AST to learners' WTC was in line with the SDT paradigm claiming the encouragement of learners' WTC by the support of autonomy to do the tasks in the classroom (Joe et al., 2017). The findings supported the role of LOC in predicting learners' WTC as well as that of SR and AST. The path coefficient also unveiled the direction of LOC on L2 WTC which was in agreement with the findings of Dincer et al. (2019) indicating that SDT-based indicators could significantly predict EFL learners' WTC. These results provided support for Pae's (2011), and Yashimata's (2012) studies that classroom climate and specific types of activities play a significant role in the prediction of AE in L2 learning. The significant path from AST to self-

regulation was supported by the pieces of evidence from the previous research documenting the effect of teachers' autonomy-supportive practices on EFL learners' self-efficacy (Duchatelet & Donche, 2019; Carver, et al., 2021; Wang et al., 2016). In line with the findings of Aghayani and Hajmohammadi (2019), the study also supported the curvilinear path of LOC to predict autonomy. As projected in the SDT framework and the positive paths leading from AST and loading indicators, the autonomy-supportive environments improve individuals' self-efficacy, consequently, increasing confidence in their ability to accomplish their tasks boosted throughout WTC in the classroom.

5. Conclusion and Implications

This study evaluated the causal paths among a series of individual and contextual variables. Based on the findings, a new model of $AST \rightarrow SR \rightarrow AE \rightarrow WTO \rightarrow LOC$ emerged based on SDT within a situated perspective. According to SDT (Ryan, 2000), learners get more motivated and engaged when their psychological requirements for autonomy, relatedness, and competence are satisfied. Since the classroom plays a crucial role in prepping a climate in which learners freely would be able to develop proficiency in L2 through interaction and communication (Fallah, 2014), it is important to equip learners with autonomy to help them succeed. The results revealed that an autonomy-supportive teaching climate expedites EFL learners' LOC and academic engagement as it assists EFL language learners to internalize and recognize the value of learning, permitting them to engage in the learning tasks willingly. The study has implications for EFL teachers, students, and researchers. Teachers can improve students' engagement, willingness to communicate, and self-regulation by teaching autonomy-supporting strategies. Moreover, students might profit from an environment where the teacher clearly states his expectations, gives chance for task engagement and tells them the rationale of learning. In this way, students would be more capable of controlling their way of learning, expressing, and presenting themselves by organizing their minds and thoughts and communicating them willingly. Since the number of the participants was one of the limitations of the study, future studies can deal with a larger sample size from various proficiency levels such as advance level. Besides, other qualitative instruments may enrich the data and support them on the other extreme.

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