

## **Self-assessment and Immunity in Online Language Learning: Probing into The Impacts of Critical Thinking, Self-Efficacy, and Academic Resilience**

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### **Abstract**

Students have the capacity to self-evaluate or make judgments about their learning process and products of learning, using criteria that they have agreed on with their teacher via the process of self-assessment. More study is needed to determine what characteristics facilitate or impede self-assessment. To this end, the present research intended to gauge the impacts of critical thinking, self-efficacy, and academic resilience on self-assessment and immunity in Saudi Arabian EFL settings. To achieve this, 423 EFL students filled out the Core of Self-assessment Questionnaire (CSAQ), the Language Student Immunity Instrument (LSIS), Watson–Glaser Critical Thinking Appraisal-Form (WGCTA), the Self-efficacy Scale (SES), and the Academic resilience (AR) to reflect on their own experiences with self-assessment, critical thinking, self-efficacy, and academic resilience. The outcomes of this study show that the level of critical thinking, immunity, self-efficacy, and academic resilience among EFL students is directly related to how well they do on their online assessments. The results demonstrated that those EFL students who maintained a healthy state of critical thinking, self-efficacy, and academic resilience felt more immune and did better in their online assessments. Further comprehensive feedback is provided about the pedagogical implications of this study.

**Keywords:** Self-assessment, Immunity, Online language learning, Critical thinking, Self-efficacy, Academic resilience

### **Background**

Pupils' opinions of their capabilities demonstrate their self-assessment (S-A), a cohesive mental structure. This thought expresses the students' underlying beliefs about who they are and how they learn (Ritonga et al., 2023). Greater S-A are connected with higher levels of involvement in educational activities because they generate a positive view of the world and improve enjoyment (Miller Smedema et al., 2015). Students exposed to positive S-A tend to have more hopeful perspectives in challenging situations. According to Kammeyer-Mueller et al. (2009), students who engage in substantial amounts of S-A can better guard themselves against various academic challenges. Previous studies have indicated that adolescents with significant quantities of S-A can better control their moods and positively interact with their teachers and peers (Wicaksono et al., 2023).

A recent study concluded that S-A and reflection may accurately predict the level of pleasure and immunity experienced by EFL learners. In other words, social intelligence and advanced cognitive skills result from productive immunity and involvement (Aldosari et al., 2023). In the same line of study, Jahara et al. (2022) showed proof that the behavioral patterns of learners had a beneficial effect on both their S-A and their

capacity to manage stress. It was also emphasized that EFL students with high levels of S-A may have more influence over their psychological conditions and are more successful in their language learning (Punpromthada et al., 2022). In this particular setting, Nurjamin et al. (2023) underlined that students may be able to impact their emotional development by observing via the S-A lens.

The notion of immunity is very recent in the field of education. (Hiver & Dörnyei, 2017) It discusses the defense mechanism undertaken by a person to resist the undesired and damaging effects of learning experiences. Academic immunity (AI), just like biological immunity, may either be beneficial or counterproductive (Hiver, 2015a). Inappropriate immunity is the offspring of the student's inability to adjust to novel ideas, shifts, and breakdowns of self-regulation mechanisms (Hiver, 2015b, 2017). Effective immunity is a safeguard contrary to unwelcome feelings, nervousness, dread, and challenges. Maladaptive immunity is the offspring of the learners' inability to adjust to growth or change.

In the words of Larsen-Freeman (2012), the self-organization theory, which is an offshoot of the complexity theory, supports the concept of immunity within the educational system. According to the self-organization theory, people may use an adaptive strategy to change the internal mechanism in response to outside disturbances to maintain their lives (Namaziandost et al., 2022). The study gap in AI is entirely analogous, and the link between the two was never pushed to the forefront of the study. Attaran et al. (2018) tried to figure out the AI of students learning a language. They contend that AI is a framework that equips learners with the social and psychological resources necessary to take action against issues and challenges. In the same vein, Aldosari et al. (2023) contended that S-A, reflection, academic enjoyment, and immunity are all windows toward effective teaching.

Concerning what Bandura (2012) describes as the objective of S-E, it instills confidence in people about their ability to engage in suitable behaviors to obtain a desired outcome. According to Olivier et al. (2018), people's S-E beliefs significantly impact how they operate, act, and approach various situations. Bandura's social-cognitive theory (1998) offers theoretical support for people's impressions of abilities that take an autonomous approach to behavior and emphasizes the effect of self-referent occurrences. This theory also gives a theoretical basis for perceptions of abilities.

Several studies have been conducted to investigate the impact of S-E skills on students' academic achievement. For instance, Wicaksono et al. (2023) concluded that learners' L2 grit and S-E are connected in the L2 context. They agreed that instructors could mold students' social, emotional, and linguistic resilience. In their investigation, Heydarnejad et al. (2022) concluded, based on their research, that performance-based evaluation had a favorable and substantial impact on reading comprehension success, academic motivation, foreign language anxiety, and students' sense of self-efficacy. In the same vein of research, Olivier et al. (2018) concluded that their results also confirmed the favorable impacts of student S-E beliefs and classroom involvement on their academic success.

Approximately two centuries ago, Socrates conceptualized CT on the premise that people's reasoning, analysis, and evaluation were the most critical components of their thinking (Fasko, 2003). Despite its extensive history of use, no consensus definition of CT has been proposed (Fisher, 2001). Ennis (1996) defines CT as a cognitive and regulated mental process that emerges from engaging in thoughtful deliberation. In a

related line of research, Thomas and Lok (2015) saw CT as resting on a foundation of knowledge, abilities, and character traits. According to Halpern (2003), CT is a kind of advanced thinking that engages many cognitive skills and mental procedures. Dewey (1933) further described CT as the sequential steps of synthesis, investigation, and assessment necessary for a satisfactory outcome.

In this regard, Rashtchi & Khoshnevisan (2022) assert that the cognitive skill of cognitive flexibility allows people to engage in effective information processing by facilitating the ability to shift attention between many stimuli and adaptively respond to changing circumstances. Consequently, cognitive CT is a valuable tool for learners, providing a secure pathway for acquiring knowledge and skills. While acquiring knowledge, pupils may encounter many disordered and intricate situations requiring prompt and resolute responses. Individuals must possess a strong foundation in CT skills to effectively utilize their metacognitive and cognitive abilities, enabling them to operate optimally. CT allows learners to pause, reflect, deeply contemplate, and evaluate their progress (Wongdaeng, 2022).

Resilience is the product of, an outcome of, and the ability to adjust effectively while dealing with challenging or frightening events and managing everyday failures and problems (Howard & Johnson, 2000). Academic Resilience (AR) is a complicated notion, and a range of elements have a vital effect on its establishment and expansion (Campbell Sills et al., 2006). Such characteristics incorporate personality, disposition, and distinguishing abilities such as engaged problem-solving and psychological features. As a result of the AR program, students receive the trust required to take risks, which in turn lessens the anxiety they face surrounding the prospect of failing their studies or leaving out of school (Kim & Kim, 2017). Based on Kim and Kim (2021), a particular description of resilience is the capacity to maintain normal growth and produce the desired modifications despite considerable hardship.

In addition, Irvin (2012) gave data indicating that thinking about what has happened and obtaining support play a crucial influence in the advancement of AR. This evidence was provided in the context of the evolution of AR. In the words of Danesh and Shahnaazari (2020), AR is the attribute that distinguishes persons who succeed from those who do not. Based on what Shafee Rad and Jafarpour (2022) found, developing resilience might be essential to students' wellness and involvement in second language instruction. Sandoval-Hernández and Bialowolski (2016) also affirm the potential usefulness of resilience and its significance in achieving success in learning a new language, making it essential to explore the characteristics of resilience in L2 and how it is connected to language learning. In the same line of inquiry, Wicaksono et al. (2023) manifested that self-efficacy, L2 grit, and AR positively influence the performance of EFL students in online assessment. They also concluded that these attributes can help avoid demotivation and disengagement in language learning.

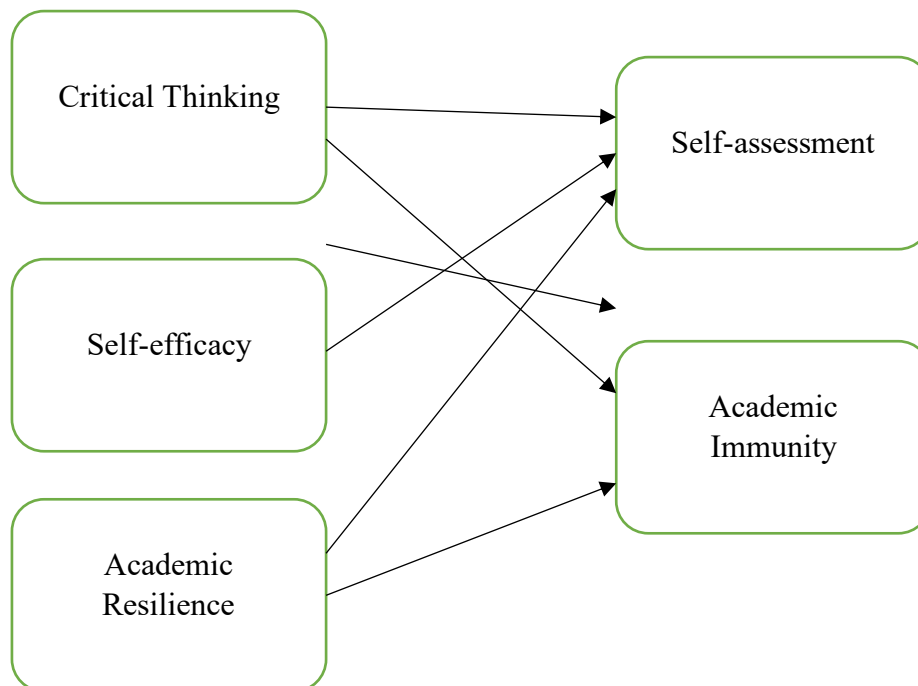
The current body of research indicates that constructs such as S-A, AI, CT, S-E, and AR are factors that students ascribe to their learning experiences and general psychological health. When individuals possess a comprehensive understanding of CT, S-E, and AR, they can demonstrate enhanced proficiency of self-assessment and immunity in online language learning. Despite their significant contributions, the potential connections between S-A, AI, CT, S-E, and AR have yet to be thoroughly explored, especially in language acquisition. A model was put forth (Figure 1) to promote deeper learning and launch a future study to depict the interactions between S-A, AI, CT,

S-E, and AR. Based on prior research and pertinent theories, this model suggested a potential relationship between S-A, AI, CT, S-E, and AR.

Thus, this study investigated the potential roles of S-A, AI, CT, S-E, and AR in the context of EFL and higher education. To accomplish this, SEM and CFA were implemented to test the proposed model. The findings of this study can help language students and teachers in both theoretical and practical ways. The following research questions were designed to help achieve these goals:

- RQ1: To what level does EFL students' CT promote their S-A and AI in online instruction?
- RQ2: To what level does EFL students' S-E promote their S-A and AI in online instruction?
- RQ3: To what level does EFL students' AR promote their S-A and AI in online instruction?

**Figure 1**  
*The Suggested Model*



## Methodology

### Participants

This study included 423 university students (164 men and 259 females) at the BA level. They were studying English Teaching at Sudia Arabian universities. The participants were chosen based on convenience or opportunity sampling approaches.

### Materials

The Core of Self-assessment Questionnaire (CSAQ) was used to gauge S-A among the participants. Judge et al. (2003) created this tool, which consists of 12 items scored on a 5-point Likert scale. The obtained scores varied between 12 and 60. Scores higher than 50 suggest a high degree of self-evaluation, while scores lower than that show an

inadequate level of self-evaluation. Cronbach's alpha (Table 1) indicated that the reliability of this instrument in the analysis we performed was satisfactory (= 0.940).

The researchers of this study made certain modifications to the Language Teacher Immunity Instrument developed and validated by Hiver (2017) to improve their ability to evaluate the participants' immunity. The Language Teacher Immunity Instrument consists of 39 items organized into seven subsections using a 6-point Likert scale. These subscales are teaching self-efficacy, burnout, resilience, attitudes toward teaching, openness to change, classroom affectivity, and coping. In its modified form, the Academic Immunity Instrument (AII) consists of seven subscales and 39 items on a 6-point Likert scale: learning self-efficacy, burnout, resilience, attitudes toward learning. The internal consistency of this scale, as measured by the Cronbach alpha coefficient, was satisfactory (Table 1).

CT was evaluated using the Watson–Glaser Critical Thinking Appraisal Form A (WGCTA) by Watson and Glaser (1980), who studied university students' CT. This measure is broken up into five categories: inference (16 items), recognizing assumptions (16 items), making deductions (16 items), interpretation (16 items), and evaluation (16 items). Each category contains a total of 32 questions. Based on Table 1, Cronbach's alpha was determined to be adequate in this investigation ( $\alpha = 0.945$ ).

The Self-efficacy Scale (S-ES) (Greene et al., 2004) was used to determine the extent to which students had confidence in their ability to succeed. The range of possible responses is from strongly disagree (1) to strongly agree (4) over seven statements. Cronbach's alpha (Table 1) suggested that the dependability of this scale was satisfactory, coming in at 0.912.

The Academic Resilience Scale (ARS) developed by Kim and Kim (2016) was utilized to conduct the AR evaluation. Twenty-six items are on this scale, and the Likert value assigned to each ranges from one to five. The remaining items can be organized into one of five categories: subjective happiness (9 things), empathy (7 items), sociability (3 items), perseverance (4 items), and self-regulation (2 items). The findings indicated a dependable SRS of 0.721 and 0.942, considered within a valid range.

Table 1  
*Reliability Results of the Questionnaires*

		N	Cronbach's Alpha
<b>Self-assessment</b>	total	12	0.940
<b>Critical Thinking</b>	Inference	16	0.921
	Recognizing Assumptions	16	0.762
	Making Deductions	16	0.934
	Interpretation	16	0.817
	Evaluation	16	0.940
	total	80	0.945
<b>Language Student Immunity</b>	Learning Self-efficacy	7	0.791
	Burnout	5	0.743
	Resilience	5	0.787
	Attitudes toward Learning	5	0.883
	Openness to Change	6	0.798
	Classroom Affectivity	6	0.778
	Coping	5	0.705
	total	39	0.778
<b>Self-efficacy</b>	total	7	0.912
<b>Academic Resilience</b>	Perceived Happiness	10	0.942
	Empathy	7	0.903

Sociability	3	0.840
Persistence	4	0.783
Self-regulation	3	0.721
total	27	0.962

### Procedure and Data Analysis

Data for this study were gathered online over four months in 2022. Participants completed a Google Forms survey including the CSAQ, AII, WGCTA, S-ES and ARS. A return rate of 80.4% was achieved in data collection. This online survey was constructed so that all responses would be linked automatically, ensuring no information would be lost. Participation in this survey was voluntary, and everyone who took part was assured that their data would be kept confidential.

The Kolmogorov-Smirnov test was used to see whether the data were normally distributed. Because the data followed a normal distribution, standard statistical methods like CFA and SEM could be applied to them. We used LISREL 8.80 to put these strategies into action.

## Results

Table 2 presents descriptive data about the variables S-A, AI, CT, S-E, and AR.

Table 2  
*Descriptive Statistics*

	N	Minimum	Maximum	Mean	Std. Deviation
<b>Self-assessment</b>	423	12	60	39.080	11.473
<b>Inference</b>	423	17	80	53.816	12.733
<b>Recognizing Assumptions</b>	423	32	76	59.790	8.280
<b>Making Deductions</b>	423	20	80	56.487	13.061
<b>Interpretation</b>	423	28	78	55.740	9.406
<b>Evaluation</b>	423	16	80	54.210	13.615
<b>Critical Thinking</b>	423	177	361	280.043	39.675
<b>Learning Self-efficacy</b>	423	7	42	28.629	4.131
<b>Burnout</b>	423	5	30	15.381	3.794
<b>Resilience</b>	423	5	30	19.778	3.741
<b>Attitudes toward Learning</b>	423	5	30	19.707	4.205
<b>Openness to Change</b>	423	9	36	23.790	4.314
<b>Classroom Affectivity</b>	423	6	36	23.754	4.689
<b>Coping</b>	423	5	30	19.820	3.508
<b>Language Student Immunity</b>	423	99	181	150.858	13.916
<b>Self-efficacy</b>	423	7	28	21.128	6.025
<b>Perceived Happiness</b>	423	13	50	35.636	9.915
<b>Empathy</b>	423	7	35	26.430	6.257
<b>Sociability</b>	423	3	15	10.686	3.258
<b>Persistence</b>	423	7	20	13.967	3.861
<b>Self-regulation</b>	423	5	15	11.537	2.130
<b>Academic Resilience</b>	423	39	135	98.255	22.630



<b>Self-assessment</b>	1.000																			
<b>Critical Thinking</b>	0.910*	1.000																		
<b>Self-efficacy</b>	0.795*	0.662*	1.000																	
<b>Academic Resilience</b>	0.645*	0.557*	0.623*	1.000																
<b>Learning Self-efficacy</b>	0.603*	0.944*	0.753*	0.486*	1.000															
<b>Burnout</b>	-0.589*	-0.802*	-0.625*	-0.432*	-0.504*	1.000														
<b>Resilience</b>	0.567*	0.898*	0.735*	0.614*	0.556*	-0.441**	1.000													
<b>Attitudes toward Learning</b>	0.631*	0.891*	0.655*	0.456*	0.489*	-0.553**	0.531*	1.000												
<b>Openness to Change</b>	0.589*	0.864*	0.716*	0.589*	0.608*	-0.612**	0.533*	0.548*	1.000											
<b>Classroom Affectivity</b>	0.608*	0.842*	0.699*	0.568*	0.556*	-0.661**	0.507*	0.532*	0.489*	0.477*	1.000									
<b>Coping</b>	0.662*	0.827*	0.688*	0.541*	0.533*	-0.589**	0.631*	0.610*	0.443*	0.498*	1.000									

\*\*Correlation is significant at the 0.01 level (2-tailed)

The findings presented in Table 4 indicate statistically significant associations between S-A, the components of AI, CT, S-E, and AR. The correlation between CT and S-A is as follows: 0.910. The correlation between CT and the elements of AI are correlated significantly: Learning Self-efficacy ( $r = 0.603$ ), burnout ( $r = -0.589$ ), Resilience ( $r = 0.567$ ), Attitudes toward Learning ( $r = 0.631$ ), Openness to Change ( $r = 0.589$ ), Classroom Affectivity ( $r = 0.608$ ), and Coping ( $r = 0.662$ ). The same is true with S-E and S-A ( $r = 0.795$ ). Moreover, S-E and the components of AI are closely connected: Learning Self-efficacy ( $r = 0.753$ ), burnout ( $r = -0.625$ ), Resilience ( $r = 0.735$ ), Attitudes toward Learning ( $r = 0.655$ ), Openness to Change ( $r = 0.716$ ), Classroom Affectivity ( $r = 0.699$ ), and Coping ( $r = 0.688$ ). The relationship between AR and S-A is also significant ( $r = 0.645$ ). Furthermore, S-E and the components of AI are closely connected: Learning Self-efficacy ( $r = 0.486$ ), burnout ( $r = -0.432$ ), Resilience ( $r = 0.614$ ), Attitudes toward

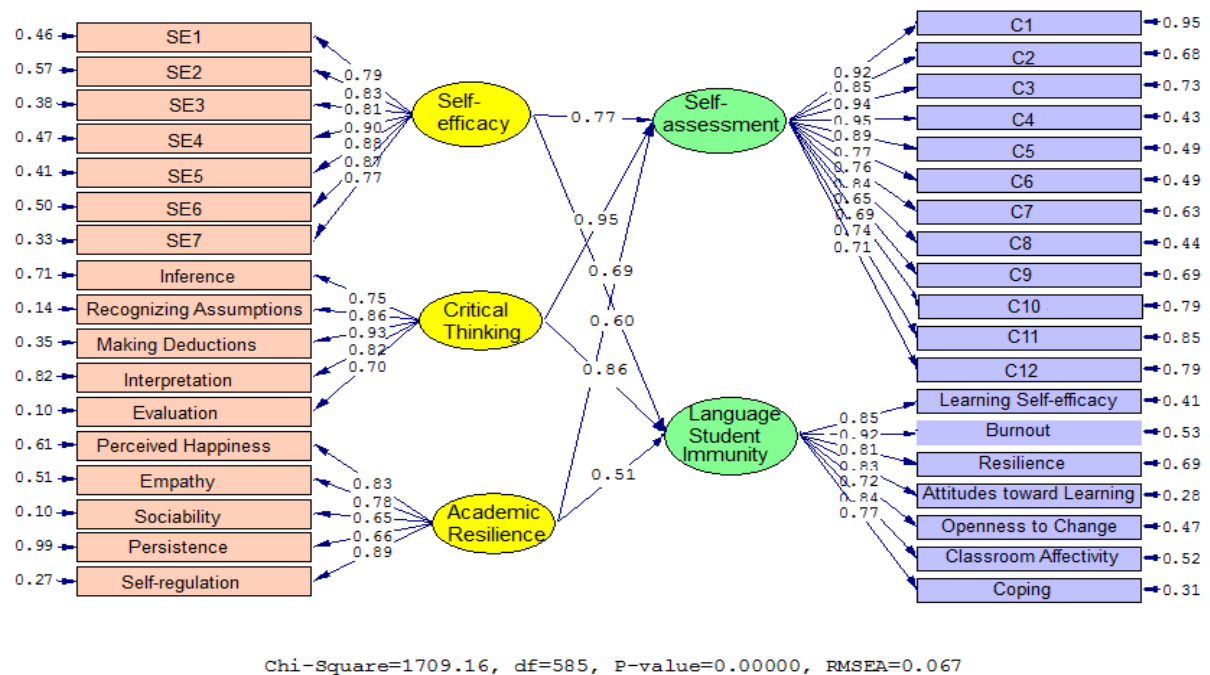


Learning ( $r = 0.456$ ), Openness to Change ( $r = 0.589$ ), Classroom Affectivity ( $r = 0.568$ ), and Coping ( $r = 0.541$ ).

Subsequently, the statistical software LISREL 8.80 was implemented to perform CAF and SEM to examine the relationships between S-A, AI, CT, S-E, and AR. Furthermore, the adequacy of the model was evaluated by using several statistical measures, including the chi-square magnitude, the Root Mean Squared Error of Approximation (RMSEA), the Comparative Fit Index (CFI), and the Nominal Fit Index (NFI). The chi-square test should provide a non-significant result, indicating that the observed data does not significantly deviate from the expected values. Additionally, the chi-square to degrees of freedom ratio should be less than three, suggesting a reasonable fit between the observed and expected frequencies. According to Jöreskog (1990), RMSEA values that are below 0.1 are commonly acknowledged in the academic community. Furthermore, Jöreskog (1990) proposes using a threshold of 0.90 or above for the NFI, GFI, and CFI.

**Figure 2**

*Diagram of Path Coefficient Values (Model 1)*



**Figure 3**

*T Values for Path Coefficient Significance (Model 1)*

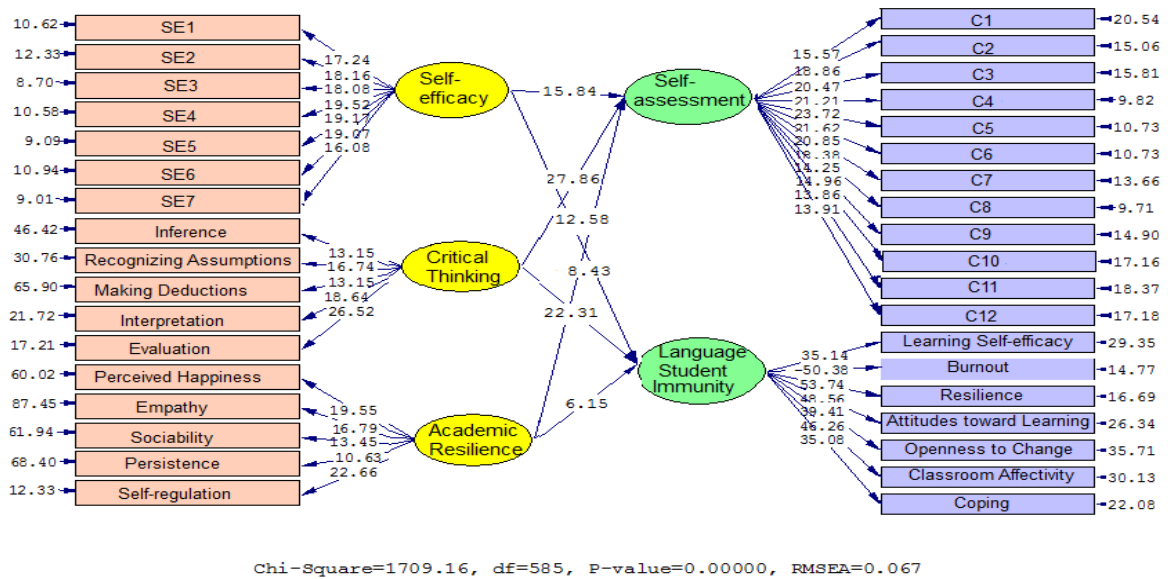
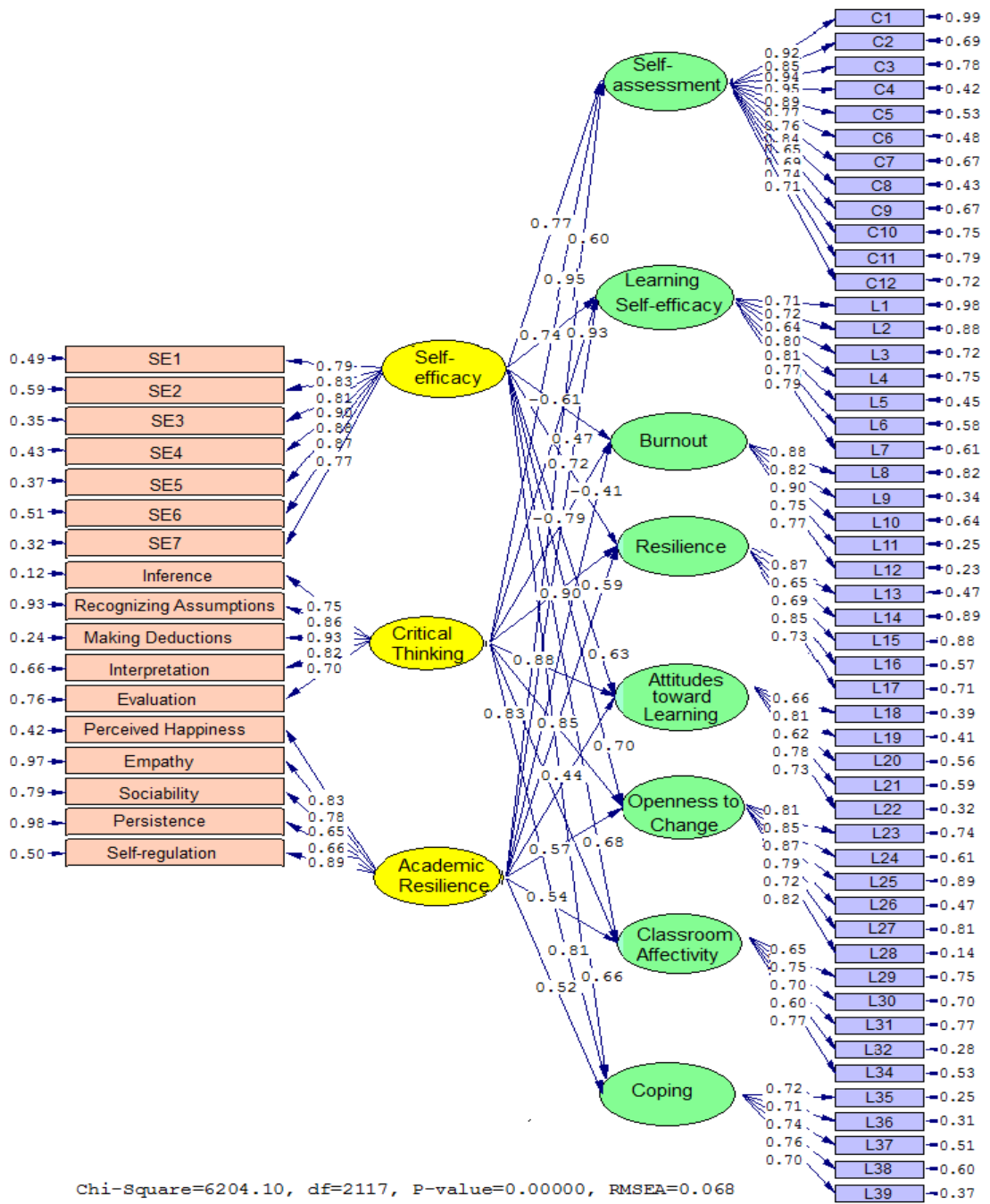


Table 5  
Summary of the Findings in Model 1

Paths		Path Coefficient	T Statistics	Test results	
Self-efficacy	→	Self-assessment	0.77	15.84	Supported
Critical Thinking	→	Self-assessment	0.95	27.86	Supported
Academic Resilience	→	Self-assessment	0.60	8.43	Supported
Self-efficacy	→	Language Student Immunity	0.69	12.58	Supported
Critical Thinking	→	Language Student Immunity	0.86	22.31	Supported
Academic Resilience	→	Language Student Immunity	0.51	6.15	Supported

Figures 2 and 3 (Table 5) displayed the statistically significant associations between the variables. These correlations show that S-E, CT, AR, S-A, and AI all have favorable interactions with one another. S-E benefitted S-A ( $\beta = 0.77$ ,  $t = 15.84$ ) and AI ( $\beta = 0.95$ ,  $t = 27.86$ ). Moreover, the substantial impact of AR on S-A ( $\beta = 0.60$ ,  $t = 8.43$ ) and AI ( $\beta = 0.51$ ,  $t = 6.15$ ) was confirmed.

Figure 4  
Diagram of Path Coefficient Values (Model 2)



**Figure 5**  
*T Values for Path Coefficient Significance (Model 2)*

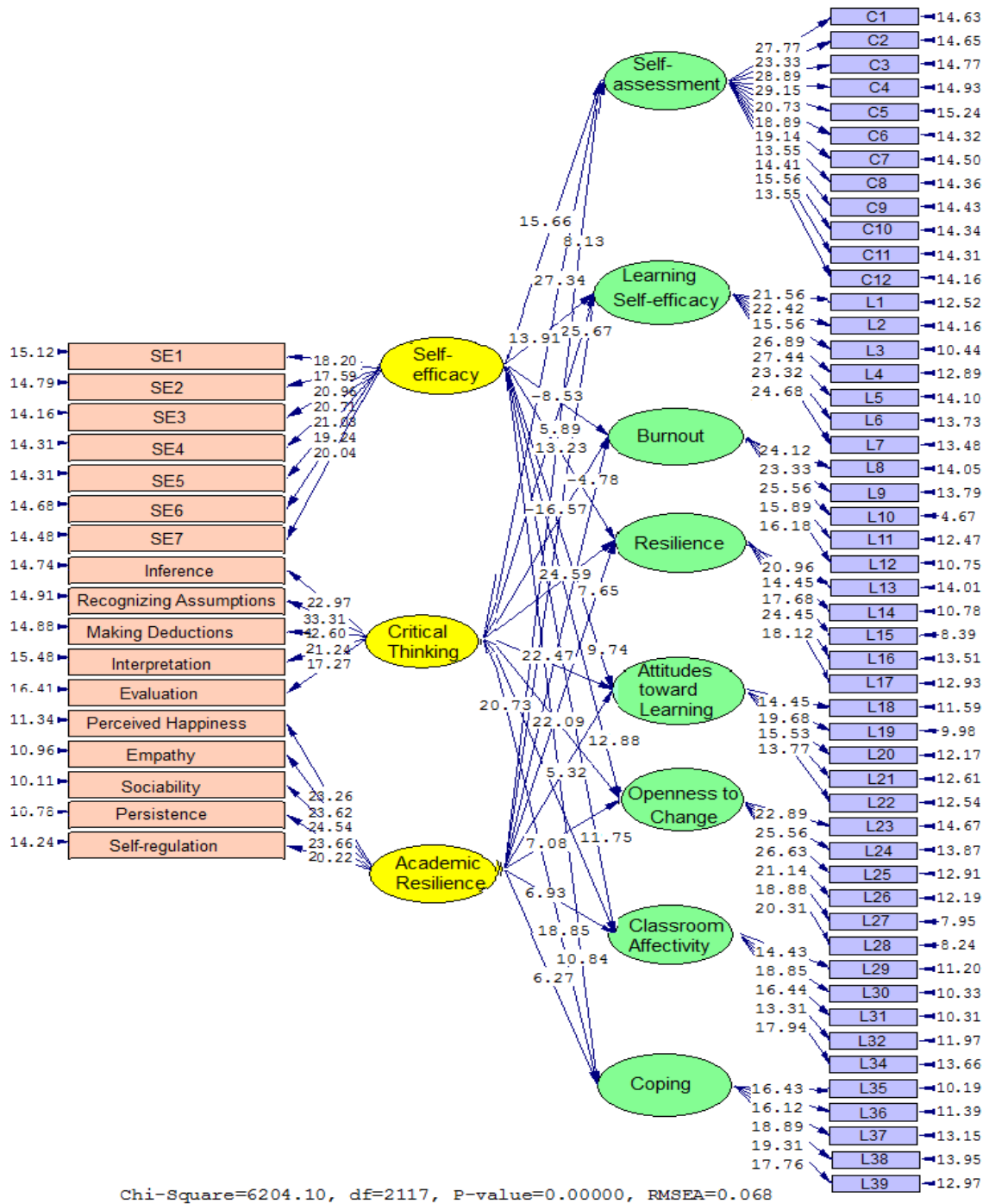


Table 6  
*Summary of the Findings in Model 2*

Paths	Path Coefficient	T Statistics	Test results
Self-efficacy → Self-assessment	0.77	15.66	Supported

Self-efficacy	→	Learning Self-efficacy	0.74	13.91	Supported
Self-efficacy	→	Burnout	0.61-	8.53-	Supported
Self-efficacy	→	Resilience	0.72	13.23	Supported
Self-efficacy	→	Attitudes toward Learning	0.63	9.74	Supported
Self-efficacy	→	Openness to Change	0.70	12.88	Supported
Self-efficacy	→	Classroom Affectivity	0.68	11.75	Supported
Self-efficacy	→	Coping	0.66	10.84	Supported
Critical Thinking	→	Self-assessment	0.95	27.34	Supported
Critical Thinking	→	Learning Self-efficacy	0.93	25.67	Supported
Critical Thinking	→	Burnout	0.79-	-16.57	Supported
Critical Thinking	→	Resilience	0.90	24.59	Supported
Critical Thinking	→	Attitudes toward Learning	0.88	22.47	Supported
Critical Thinking	→	Openness to Change	0.85	22.09	Supported
Critical Thinking	→	Classroom Affectivity	0.83	20.73	Supported
Critical Thinking	→	Coping	0.81	18.85	Supported
Academic Resilience	→	Self-assessment	0.60	8.13	Supported
Academic Resilience	→	Learning Self-efficacy	0.47	5.89	Supported
Academic Resilience	→	Burnout	0.41-	4.78-	Supported
Academic Resilience	→	Resilience	0.59	7.65	Supported
Academic Resilience	→	Attitudes toward Learning	0.44	5.32	Supported

Academic Resilience	→	Openness to Change	0.57	7.08	Supported
Academic Resilience	→	Classroom Affectivity	0.54	6.93	Supported
Academic Resilience	→	Coping	0.52	6.27	Supported

The significance levels of the route coefficients for the associations between the S-A, the components of AI, CT, S-E, and AR are visually depicted in Model 2, as illustrated in Figures 4, 5, and Table 6: S-E and S-A ( $\beta = 0.77$ ,  $t = 15.66$ ), Learning Self-efficacy ( $\beta = 0.74$ ,  $t = 13.91$ ), burnout ( $\beta = -0.61$ ,  $t = -8.53$ ), Resilience ( $\beta = 0.72$ ,  $t = 13.23$ ), Attitudes toward Learning ( $\beta = 0.63$ ,  $t = 9.74$ ), Openness to Change ( $\beta = 0.70$ ,  $t = 12.88$ ), Classroom Affectivity ( $\beta = 0.68$ ,  $t = 11.75$ ), and Coping ( $\beta = 0.66$ ,  $t = 10.84$ ) are closely related. Similarly, CT and S-A ( $\beta = 0.60$ ,  $t = 8.13$ ), Learning Self-efficacy ( $\beta = 0.47$ ,  $t = 5.89$ ), Burnout ( $\beta = -0.41$ ,  $t = -4.78$ ), Resilience ( $\beta = 0.59$ ,  $t = 7.09$ ), Attitudes toward Learning ( $\beta = 0.44$ ,  $t = 5.32$ ), Openness to Change ( $\beta = 0.57$ ,  $t = 7.08$ ), Classroom Affectivity ( $\beta = 0.54$ ,  $t = 6.93$ ), and Coping ( $\beta = 0.81$ ,  $t = 18.85$ ) are tied. Additionally, the interplay among AR and S-A ( $\beta = 0.60$ ,  $t = 8.13$ ), Learning Self-efficacy ( $\beta = 0.47$ ,  $t = 5.89$ ), Burnout ( $\beta = -0.41$ ,  $t = -4.78$ ), Resilience ( $\beta = 0.59$ ,  $t = 7.65$ ), Attitudes toward Learning ( $\beta = 0.44$ ,  $t = 5.32$ ), Openness to Change ( $\beta = 0.57$ ,  $t = 7.08$ ), Classroom Affectivity ( $\beta = 0.54$ ,  $t = 6.93$ ), and Coping ( $\beta = 0.52$ ,  $t = 6.27$ ) are supported.

Table 7  
*Model Fit Indices (Model 2)*

Fitting indexes	$\chi^2$	df	$\chi^2/df$	RMSEA	GFI	NFI	CFI
Cut value			<3	<0.1	>0.9	>0.9	>0.9
Model 1	1709.16	585	2.922	0.067	0.933	0.959	0.927
Model 2	6204.10	2117	2.931	0.068	0.964	0.948	0.957

Based on the data in Table 7, the requirements for a satisfactory fit for model 1 were met when the GFI was 0.933, the NFI was 0.959, and the CFI was 0.927. Furthermore, the chi-square/df ratio was 2.922, and the RMSEA was 0.067. Along with this, Model 2 has adequate values for all of the model fit metrics that are presented in Table 4. This information is summarized clearly and briefly in the table. The chi-square/df ratio comes in at 2.931, the RMSEA comes in at 0.068, the GFI comes in at 0.964, the NFI comes in at 0.948, and the CFI comes in at 0.957.

### Discussion and Conclusion

The purpose of this study was to determine whether or not CT, S-E, and AR could accurately predict S-A and AI among a group of 423 university students studying English Teaching at universities in Saudi Arabia. Their instruction and assessment were online. In this regard, an SEM was applied to verify the causal structural model between the above-mentioned concepts and demonstrate their mutually reinforcing relationships. All in All, the study's findings supported the hypothesis that CT, S-E, and AR play a mediating role in boosting learners' S-A and AI.

Concerning the first research question (To what level does EFL students' CT promote their S-A and AI in online instruction?), the study findings approved significant and positive effects. The research results showed that CT may be a facilitator in the online assessment of university learners. This suggests that having CT abilities leads to more introspection. In other words, CT dictates the framework for developing SE and ego in university-level EFL learners. The more individuals use CT methods, their ideas and beliefs shift positively. That is to say, CT aids students in enhancing their online assessment, in agreement with the findings by Riswanto et al. (2022).

The findings indicated that CT increased the operational immunity of EFL learners (Model 1). University students who avoid engaging in routine behaviors and instead engage in self-reflection and critical self-reflection are more likely to achieve learning goals related to optimism, adaptability, perspectives on learning, willingness to adapt, classroom affectivity, and managing stress. In simple terms, CT skills are associated with self-awareness, self-management, L2 perseverance, and self-efficacy (Ritonga et al., 2023; Namaziandost et al., 2023), which are the characteristics required for achieving effective immunity. Taking everything into consideration, CT has the potential to assist students in behaving decisively and thoughtfully, particularly on their online assessments; however, the reciprocal relationships between CT and AI cast a bit of a shadow and call for additional research, particularly in the EFL setting.

The results related to the second research question showed that the degree to which EFL students owned S-E could accurately predict S-A and AI, especially in online assessments. Social-cognitive theory's (Bandura, 2012) significant principles lend credence to this conclusion by emphasizing the importance of students' active participation in self-administration and introspection to support improvement in their sense of efficacy. Practical reasoning, metacognitive, and problem-solving strategies are more accessible to learners who have a healthy dose of the favorable self-image that develops from the core of self-assessment (Alazemi et al., 2023). Data research shows that encouraging S-E skills is a powerful message for supporting and immunizing language students as they meet the challenges presented by a gradual procedure of language acquisition and online assessments (Aldosari et al., 2023; Wicaksono et al., 2023).

The self-efficacy paradigm, as described by Bai et al. (2019), encourages observation to foster growth in an individual's self-awareness and confidence. A higher level of support is provided to learners with an S-E intellectual characteristic so that they may succeed in education. Since S-E emphasizes the importance of each student's personal development, it is reasonable to assume that it will also boost students' immunity to online learning and evaluation. S-E and evaluating oneself is, thus, vital to the immune system's efficiency.

Concerning the third study question, which centered on how EFL students' AR promotes their S-A and AI in online education, the findings indicated that the amount of resilience defined the pace for S-A and AI. University students taking part in SR have a better chance of benefiting from the exercise since it encourages them to think about how they are psychologically experiencing and to develop novel remedies to the tension that upcoming online tests will generate. Supported by the self-determination assumptions (Martin & Marsh, 2009), a surge in the extent to which a person is aware of themselves leads to gains in the individual's drive, fulfillment, resilience, and engagement in the classroom. University students with a vital AR can better react creatively to challenges

by establishing feasible goals and making genuine efforts to adjust to the societal standards and social expectations of the societies in which they have found. This finding is in accord with the results by Alazemi et al. (2023), who concluded that a balance in academic emotion regulation, L2 grit, resilience, and S-A helps EFL students regulate test anxiety.

In conclusion, the results of this analysis demonstrated the predictive value of CT, S-E, and AR to S-A and AI among university students attending online instruction. The results suggested that CT, S-E, and AR function like a map and a guide for EFL students, guiding them along the path of their education and shielding them from the challenges and difficulties of learning. CT, S-E, and AR affect the perceptions and immunity of students learning regarding the process of learning the language, undergoing assessments, and communicating with their teachers and peers. This is because EFLs with a high AR are more likely to have a positive outlook on life. The study's findings also suggested a significant effect that CT, S-E, and AR had on S-A and AI in online assessment.

It is advised that teachers consider specific pedagogical implications, particularly in language instruction and evaluation. Language instructors and students should know how to utilize S-A and AI techniques effectively. In this context, it is recommended that prospective teachers participate in training programs to acquire related knowledge. It is essential for language learners, particularly those enrolled in higher education, to learn and practice self-assessment and CT procedures; hence, it is strongly recommended that instructional materials and activities be designed with these standpoints in mind. As a result, the position of learners as reflective practitioners ought to move to the forefront of educational perspectives.

In higher education, the practice of advanced cognitive abilities and S-A seems to be a more practical approach to language teaching and assessment than other approaches. University teachers and professors should look for ways to empower students to take charge of their education and cultivate an appropriately positive degree of S-A, which assists students in maturing into fully independent individuals. It is highly recommended that lessons be designed that, in addition to focusing on academic topics, help students develop influential self-help conceptions. Monitoring one's own and awareness of oneself are skills that should be exercised from the very first stages of learning a new language. Consequently, students will have a higher chance of developing effective immunity and attaining academic success.

This study, like many others that have been conducted in the field of education, has a few shortcomings, including the following: To begin, the current research is quantitative in its design. Future researchers may employ mixed-method approaches to gain a more in-depth understanding of the correlations between CT, S-E, AR, S-A, and AI. In addition, the socioeconomic backgrounds of the participants and their potential effects on CT, S-E, AR, S-A, and AI were not examined in this study; as a result, those aspects are candidates for the focus of research that will be conducted in the future. In addition, the relationship between CT, S-E, AR, S-A, and AI was investigated among university students learning English as a foreign language. It is recommended that future research concentrate on the probable connections between them in different kinds of educational settings. Lastly, online assessment is considered in this study; future research may compare the findings of this research with face-to-face assessment.

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