



Validating a Self-Regulated Writing Strategy Questionnaire for Sri Lankan ESL Learners at the Tertiary Level

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ABSTRACT

L2 writing is a crucial skill that university students strive to improve, as writing proficiency is essential to succeed in their academic studies. Similarly, self-regulated writing (SRW) strategies play a significant role in enhancing students' writing abilities. This study aimed to explore university students' use of self-regulated writing strategies, and through this process, we validated a model of student self-regulated writing strategies as a theoretical framework. This study validated a 7-point Likert scaled SRW strategy questionnaire comprising 37 items organized under five key dimensions: cognitive, metacognitive, social, motivational regulation, and behavioural. A total of 320 university students majoring in engineering technological fields participated in this study rating self-regulated writing strategies under five dimensions. Principal Component Analysis was utilized to examine the underlying factor structure of the questionnaire, which resulted in identification of eight constructs. These eight constructs collectively accounted for 64% of the total variance. The high reliability of the constructs further confirmed the validity and consistency of the questionnaire, ensuring that the validated instrument is robust for future research on self-regulated writing strategies in the L2 context and can inform both practical applications and future research in L2 writing instruction.

KEYWORDS: *Self-regulated writing strategies, cognition, metacognition, motivation, Sri Lankan ESL context*

1 INTRODUCTION

In Sri Lanka, English language plays a pivotal role in various sectors including education, administration, medicine, and engineering. It is taught and learnt as a Second Language (L2) within the Sri Lankan education system. In the tertiary educational context, English is either used as the second language or as the medium of instruction enabling students to succeed in their academic and career life. Thus, English as a Second Language (ESL) learners at the tertiary level are required to improve their language skills in order to accomplish the academic and professional achievements.

Among the four language skills, writing plays a significant role due to several reasons. It is a multi-level component of language learning for ESL learners that integrates linguistic skills, writing strategies, and pedagogical aspects. Writing skills are essential for tertiary-level ESL learners to achieve their academic and professional success. Furthermore, stages of writing such as planning and organizing ideas, maintaining cohesion and coherence, using effective L2 writing strategies, and regulating mood when writing are crucial in achieving L2 writing proficiency.

According to Lightbown and Spada (2013), the linguistic environment is a critical external factor affecting the learners' writing skills. Self-Regulated Learning (SRL) plays a significant role in enhancing writing performance and making learners more responsible and autonomous. According to Zimmerman and Bandura (1994), learners who

excel in self-regulation are more successful in writing, as it enables them to become more autonomous. SRL enables learners to set goals, select effective writing strategies, and monitor and evaluate their writing progress. Rivers and Temperley (1979), contend that writing is the most complex skill for ESL/EFL learners to improve, as it requires consistent focus and regular practice. In this context, SRL enables ESL learners to adapt to new ESL writing tasks in different contexts ensuring learner autonomy. Nevertheless, ESL learners encounter diverse challenges in writing such as a lack of knowledge of linguistic features, and a lack of knowledge of effective writing strategies. SRL, thus, promotes the use of strategies that can be effectively applied at different stages of the L2 writing process, including planning, organizing, outlining, writing, and revising. Extensive research has been conducted on SRL strategies grounded on theoretical frameworks that highlight their role in enhancing learner autonomy, motivation, and academic performance (e.g., Boekaerts 1999; Pintrich 2000; Winne 2011; Zimmerman 1989).

According to Zimmerman and Risemberg (1997), SRL writing strategies are cognitive and behavioural activities that individuals use to initiate, regulate, and sustain the writing process toward the accomplishment of specific writing goals. Furthermore, studies by Shen and Bai (2022), Teng and Zhang (2016), and Wang and Bai (2017) have identified five key dimensions of SRL writing strategies: Cognitive, metacognitive, motivational, social, and behavioural.

Cognitive strategies for L2 writing refer to the writing strategies that activate the brain functions and manage learners' thoughts, writing structure, and overall quality of the writing task. Teng and Zhang (2016) state text-generating and memory strategies as major cognitive strategies. Text-generating strategies assist learners to produce a grammatically accurate and coherent text while memory strategies help the learners in retrieving vocabulary, grammar, and previously referenced information within the writing task.

Metacognitive strategies play a crucial role in supporting writers throughout the writing process. Teng and Zhang (2016) identify two key types of metacognitive strategies. First, idea planning aids in organization of thoughts and content prior to and during writing while goal-oriented monitoring and evaluation assist writers to actively monitor and regulate their writing such as revising their writing and regulating their cognitive processes as required.

Social-behavioural strategies refer to the interactions related to social support and behavioural aspects in L2 writing. These strategies include peer learning, feedback-handling, seeking opportunities, and e-learning practices. According to existing literature (Bai, Wang & Zhou 2021; Teng & Zhang 2016, Wang & Bai 2017), peer feedback, teacher feedback, and self-feedback provide learners with extensive reflection and improvement in the writing tasks.

Motivational regulation refers to the strategies learners employ to manage their motivation and

interest for L2 writing. Teng and Zhang (2016), mention that strategies such as interest enhancement, motivational self-talk, and emotional control strategies play a crucial role in helping learners maintain motivation during L2 writing tasks.

Teng and Zhang (2016) validated a questionnaire for SRL writing strategies with 790 Chinese university students using Confirmatory Factor Analysis (CFA). This questionnaire included strategies based on previous studies (Pintrich 2004; Wolters 1999; Zimmerman & Pons 1986). The initial questionnaire consisted of 45 items, administered using a 7-point Likert scale, which extracted 40 items into nine factors across four dimensions. The results identified text processing and course memory under the cognitive dimension, idea planning, goal-oriented monitoring and evaluating under the metacognitive dimension, peer learning, feedback handling under the social behavior dimension, interest enhancement, motivational self-talk, and emotional control under the motivational regulation dimension.

Moreover, Bai, Wang and Zhou (2021) conducted an interventional study that aimed at improving self-regulated writing strategies through e-learning. The study adapted the pre-test and post-test methods and a questionnaire with three sections. First, SRL writing strategies including planning, text-generating, self-monitoring, and revising strategies were adapted from Bai et al.'s (2014) Questionnaire of Self-Regulated Writing Strategy Questionnaire (SRWSQ) and validated through

exploratory factor analysis. Second, motivation-related items such as writing self-efficacy and writing interest, were adapted from Pintrich and De Groot's (1990) study and validated through exploratory factor analysis. Third, e-learning acceptance included perceived usefulness, perceived ease of use, attitude, and continuance intention was adapted from Bai, Wang and Chai's (2019) study, and validated through a CFA with Mplus. The results revealed that the intervention showed significant improvements in the use of SRL strategies by the students.

Similarly, Wang and Bai (2017) study adapted the Questionnaire of English Self-Regulated Learning Strategies (QESRLS), which is based upon the SRL theory developed by Zimmerman and Pons (1986) through structured interviews. The original QESRLS included 11 constructs: self-evaluation, organization and transformation, rehearsal and memorization, seeking social assistance, persistence when faced with challenges, seeking opportunities to practice English, record keeping and monitoring, self-consequences, goal-setting and planning, review of records, and interpretation guessing. However, all items were loaded into a single self-regulated learning strategies factor in this study. As a result, the study did not conduct a CFA; instead, calculated the mean scores of participants' responses to rank the items by frequency use.

Kodithuwakku (2013) investigated metacognitive writing strategies among 678 Sri Lankan secondary school learners utilizing a mixed-methods approach, incorporating

interviews, observations, and a questionnaire. The results of Z-tests, Chi-square tests, and factor analysis revealed a general lack of awareness among students regarding metacognitive strategies associated with the planning phase of the writing process. Conversely, the presence of knowledge-telling strategies was observed during writing. Moreover, the revising stage was found to be largely mechanical and superficial. The study also identified gender-based differences: Female students demonstrated a higher tendency to engage in metacognitive strategies during the planning phase, whereas male students were more proficient during the actual writing phase.

Moreover, Herath (2021) conducted a study on portfolio assessment as an effective tool in fostering self-regulation and critical reflection among 120 first-year students enrolled in the Higher National Diploma in English (HNDE) program learners. Over the course of one academic year, students' writing classes were observed, and their portfolios were collected and evaluated at the end of year. Portfolio assessment involved both peer and self-evaluation, aiming to promote learner autonomy. The findings demonstrated that participants engaged in goal setting, actively monitored their L2 learning processes, and regulated their behavior in alignment with classroom ethical standards. The study concluded that portfolio maintenance serves as an effective task in L2 learning, promoting both self-regulation in writing and critical reflection.

The aforementioned studies underscore the pivotal role of self-regulated writing strategies across various dimensions in L2 writing, particularly within the EFL context. However, despite their contributions, there remains a notable dearth of research focusing on SRL strategies in writing within the ESL context particularly in the Sri Lankan tertiary level. This gap highlights the pressing need to investigate the complex and multifaceted nature of self-regulated writing strategies grounded in the theoretical framework of SRL. The research question of this study is: *What are the dimensions and constructs of ESL writing strategies for Self-Regulated Learning (SRL)?* Such an investigation should consider the core theoretical dimensions of SRL, namely, cognitive, metacognitive, motivational, social, behavioural, and motivational aspects. Therefore, there was a compelling need to explore the complex and multifaceted nature of SRL writing strategies grounded on the SRL theory and seek to develop and validate an appropriate instrument for measuring these constructs. This approach will contribute to a more comprehensive understanding of how ESL learners regulate their writing processes, particularly, in the tertiary ESL context, and inform effective pedagogical practices.

Thus, the main objective of this study was to investigate the underlying dimensions of SRL writing strategies and validate the SRWSQ grounded in SRL theory. The study, specifically, sought to measure five key dimensions of SRL - measuring the cognitive, metacognitive, social, behavioural, and motivational regulation - by exploring the

multifaceted structure of SRL writing strategies among the tertiary-level ESL learners in Sri Lanka.

2 MATERIALS AND METHODS

The present study employed a quantitative research approach. A total of 320 first- and second-year ESL learners who were enrolled at a higher educational institute affiliated with a government university in Sri Lanka, participated in this study. The sample comprised 192 male students (60 %) and 128 female students (40 %), with participants' ages ranging from 20 to 26 years. The sample was selected through a stratified sample method, ensuring the representation of students from all engineering technology fields including civil, electrical, electronics and telecommunications, mechanical, polymer and chemical, textile and clothing, and information technology. These learners were required to complete two compulsory English modules during the first two semesters. Observations indicated considerable variation in their proficiency with academic writing tasks, as well as marked differences in motivation and engagement across both in-class and extended writing activities. Given this context, it becomes essential to examine the extent to which these learners employ self-regulated learning (SRL) strategies in their writing practices, and to identify the specific dimensions of SRL that may influence their academic writing performance.

2.1 Data Collection Instrument

A questionnaire to investigate the use of SRL writing strategies by ESL learners was developed by adapting three instruments available in the extant literature: The questionnaires introduced by Teng and Zhang (2016), with 40 items, Wang and Bai (2017), with 65 items, and Bai, Wang and Zhou (2021), with 43 items. Based on these studies, a preliminary list of 48 items tailored to the Sri Lankan ESL context was created across 11 factors under five dimensions: Cognitive, metacognitive, social, motivational, and behavioural (See Table 1). The validity of the questionnaire items, specifically regarding their

theoretical dimensions of L2 writing strategies for self-regulated learning and their relevance to the Sri Lankan ESL tertiary context, was assessed by three experts in the field. The questionnaire used a 7-point Likert scale ranging from 1 (very untrue of me) to 7 (very true of me) in order to capture subtle differences in learners' use of SRL writing strategies. The items under each dimension were categorized into specific strategies such as text generating and memory under the cognitive dimension, idea planning and goal-oriented monitoring and evaluating under the metacognitive dimension, and so on as outlined in Table 1.

Table 1. Contents of the Questionnaire

Section	Key area/ Dimension	Constructs	No. of Items
1	Research consent form	Objectives of the research, confidentiality, data usage, and consent form	
2	7-Point Likert scale	Very Untrue of Me, Untrue of Me, Somewhat Untrue of Me, Neutral, Somewhat True of Me, True of Me, Very True of Me	
3	Demographic details	Registration number, gender, semester, age, field, ethnicity, A/L District, A/L General English Result	
4	Cognitive	Text Generating	9
		Memory	3
5	Metacognitive	Idea Planning	4
		Goal-Oriented Monitoring and Evaluating	9
6	Social	Peer-Learning	3
		Feedback Handling	3
7	Motivational Regulation	Interest Enhancement	4
		Motivational Self-Talk	3
		Emotional Control	3
8	Behavioral	Seeking Opportunities	4
		E-Learning Acceptance	3
Total Likert scale items			48

Note: Adapted from Teng and Zhang (2016), Wang and Bai (2017), and Bai et al. (2021).

2.2 Data Collection and Analysis Procedure

Before administering the questionnaire, we piloted it with a sample of another group of ESL learners to confirm that all items in the questionnaire were clearly worded and easy to understand. After adjustment, the questionnaire was administered in the middle of the semester since learners had sufficient exposure to the ESL writing component of the course module by then. The finalized questionnaire was administered via a Google form while students were in the regular classroom and required approximately 20 minutes for participants to complete. Clear instructions were provided to participants to answer the questionnaire items. Simultaneously, the participants were encouraged to seek clarifications on any items they found unclear and any queries raised were promptly addressed. Out of the initial sample of 320, 301 questionnaire responses were considered for the final analysis, resulting in a valid response rate of approximately 94.06%. The data were analyzed using Principal Component Analysis (PCA) to identify the underlying factor structure associated with SRL writing strategies.

3 RESULTS & DISCUSSION

3.1 Factor Structure of the ESL Writing Strategies for Self-Regulated Learning (SRL)

The main purpose of this study was to investigate the factor structure of the ESL writing strategies used for SRL. Specifically, this research sought to identify the underlying factors that define Sri Lankan tertiary level ESL learners' writing strategies for SRL across five

dimensions: Cognitive, metacognitive, motivational, social, and behavioural.

The Kaiser–Meyer–Olkin (KMO) measure of sample adequacy and Bartlett's test of sphericity were initially employed to assess the suitability of the data for Factor analysis (Pallant 2011). The KMO measure yielded a value of 0.82 which exceeds the minimum threshold 0.60 as recommended by Tabachnick and Fidell (2013) indicating a good level of sample adequacy. In addition, Bartlett's test of sphericity was found to be statistically significant ($p > .001$), further supporting the factorability of the data. Subsequently, Principal Component Analysis (PCA) was performed on the dataset consisting of 48 items. In this process, Varimax rotation was applied to facilitate the extraction of factors with high loadings as it is known for maximizing the variance of squared loadings within each factor while minimizing variance across factors (Pallant 2011). The use of Varimax rotation method was chosen to improve the clarity, simplicity, and interpretability of the factor structure.

An initial PCA was performed to calculate the eigenvalues for each factor derived from the data. Firstly, the PCA extracted nine factors; however, several items exhibited inconsistency and low loadings. To address this issue, PCA procedure was repeated, by systematically excluding problematic items. Conclusively, this analysis yielded eight factors with eigenvalues exceeding Kaiser's criterion of one, leading to a more coherent and robust solution. The scree plot also displayed inflection points supporting

the retention of eight factors. This decision was supported by considerations such as the large sample size, the clarity of the factor solution, and the alignment between the scree plot and Kaiser's criterion.

The factor loadings with Varimax rotation revealed the distribution of 37 items across eight factors. These are displayed in Table 2. The overall reliability of these 37 items in the questionnaire reported a robust Cronbach's

alpha coefficient of .94, confirming the internal consistency of the measurement instrument. Further, these factors explained a significant 63.59% of the total variance in factors related to ESL writing strategies for SRL, demonstrating strong explanatory power as demonstrated in Table 2. This significant variation indicates that the identified factors provide substantial insight into the variables related to SRL writing strategies under each dimension.

Table 2. Rotated Component Matrix of the Principal Component Analysis for the Questionnaire Items

Factor Loadings and Items		Component							
		1	2	3	4	5	6	7	8
Factor 01: Motivational Dimension: Motivational Regulation (MR) (Cronbach's Alpha Coefficient = .89)									
1	<i>I remind myself of the importance of getting good grades in English writing activities.</i>	.75	.36	.10	.06	.14	-.02	.08	.08
2	<i>I encourage myself to keep on writing when I feel like giving up.</i>	.69	.04	.03	.16	.12	.35	.16	.11
3	<i>I find ways to adjust (regulate) my mood when I want to give up writing.</i>	.64	.12	.01	.34	.14	.25	.14	.13
4	<i>I tell myself not to worry when taking a writing test or answering writing questions.</i>	.63	.10	.07	.18	.23	.28	.26	.13
5	<i>No matter how challenging the English essay is, I try my best to write it well.</i>	.62	.42	.03	.10	.13	.13	.14	.05
6	<i>I reward / appreciate myself when I make progress in writing.</i>	.62	.13	.20	.05	.15	.33	.14	.07
7	<i>I remind myself that it is important to practice writing to get more marks/achieve higher marks than peers.</i>	.58	.15	.33	.02	.15	-.08	.09	-.02
8	<i>I try to improve my English writing based on teacher feedback.</i>	.57	.16	.32	.15	.13	-.13	.16	-.10
9	<i>I connect the writing task with my real-life experiences.</i>	.49	.22	.07	.26	.011	.11	-.02	.32
Factor 2: Cognitive Dimension: Text Generating (TG) (Cronbach's Alpha Coefficient = .83)									
10	<i>When writing, I check spelling and punctuation.</i>	.24	.72	.07	.09	.03	.11	-.01	.09
11	<i>When writing, I check grammar mistakes.</i>	.18	.70	-.00	.17	.17	.22	-.02	.19
12	<i>When writing, I use sequence markers (E.g. / first, second, next, finally ...) to make connections among sentences and paragraphs.</i>	.18	.64	.13	.10	.12	.26	.03	.19
13	<i>When writing, I check whether the content is relevant to the topic.</i>	.23	.51	-.01	.11	.26	.28	.16	.00
14	<i>I pay attention to the English language structure while writing.</i>	.27	.51	.22	.19	.27	.26	.06	-.07

Factor 3: Social Dimension: Peer Learning (PL) (Cronbach's Alpha Coefficient = .84)

15	<i>I ask my peers when I have questions in my English writing.</i>	.12	.21	.80	-.04	.15	.06	.14	.02
16	<i>I try to improve my English writing based on peer feedback.</i>	.19	.06	.78	.13	.17	-.08	.09	-.01
17	<i>I work with my peers to complete the writing activity.</i>	.11	-.02	.75	.07	.05	.35	.16	.12
18	<i>I discuss the writing activity with my peers / friends.</i>	.11	-.01	.73	.20	-.05	.18	.03	.29

Factor 4: Behavioural Dimension: Seeking Opportunities (SO) (Cronbach's Alpha Coefficient = .77)

19	<i>I write letters in English.</i>	.20	.15	.11	.73	.03	.13	.12	-.10
20	<i>I write in blogs (personal websites) in English.</i>	.06	.07	.07	.71	-.02	.07	.19	.11
21	<i>I send emails in English.</i>	.16	.32	-.00	.59	.21	-.01	.24	-.02
22	<i>I select interesting topics to practice English writing.</i>	.23	-.02	.23	.58	.08	.14	-.06	.29
23	<i>I send text messages in English.</i>	.14	.35	-.01	.49	.31	.09	.24	-.10

Factor 5: Metacognitive Dimension: Monitoring (MO) (Cronbach's Alpha Coefficient = .80)

24	<i>I re-read the question to help myself think of new ideas.</i>	.37	.16	.11	-.05	.73	-.01	.16	.05
25	<i>I keep reading my essay and note down the mistakes that I often make in my writing.</i>	.19	-.01	.27	.27	.57	.16	-.15	.28
26	<i>I read back what I have written to help myself think of new ideas.</i>	.11	.33	.07	.04	.57	.28	.20	.05
27	<i>When writing, I remind myself to follow the plan.</i>	.20	.27	.16	.22	.46	.23	.01	.11
28	<i>When I finish my English essay, I take a break and then read it again to check whether it needs revision.</i>	.29	.22	.23	.25	.44	.35	-.17	.12

Factor 6: Cognitive Dimension: Text Structuring and Organizing (TS) (Cronbach's Alpha Coefficient= .74)

29	<i>I make sure to write a topic sentence in each paragraph.</i>	.10	.33	.13	.10	.04	.70	-.04	.01
30	<i>I make sure that the content of each paragraph supports its topic sentence in English writing.</i>	.21	.29	.13	.14	.17	.68	.11	.01
31	<i>After writing, I adjust vocabulary / words appropriately.</i>	.24	.32	.25	.20	.31	.41	-.08	.17

Factor 7: Behavioural Dimension: E-Learning Acceptance (ELA) (Cronbach's Alpha Coefficient= .76)

32	<i>I believe that e-learning tools can create an effective learning environment for English writing.</i>	.29	.05	.18	.11	.04	.11	.77	.08
33	<i>I will continue using e-learning as a tool for my future learning.</i>	.26	.05	.06	.11	.09	.04	.77	.06
34	<i>I use e-learning tools (Ex/ software, apps.) in English writing.</i>	.03	-.00	.18	.35	.04	-.06	.65	.18

Factor 8: Metacognitive Dimension: Idea Planning (IP) (Cronbach's Alpha Coefficient= .67)

35	<i>Before writing, I use the internet to search for related information to help with my planning.</i>	.20	.19	.18	-.03	-.07	-.04	.12	.74
36	<i>Before writing, I read related articles to help plan my writing activities.</i>	-.04	.03	.10	.22	.32	.12	.10	.70
37	<i>I recall / think of ideas that I have read in books or others' essays and use them in my writing</i>	.12	.23	-.04	-.04	.27	-.02	.25	.55

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

The first factor, consisting of nine items, explained a significant 32.54% of the total variance. These items highlighted the role of motivation in sustaining consistent engagement with L2 writing activities. These items explained how the learners regulate their emotions and attitudes towards writing, thereby fostering interest and a positive perspective on their writing activities. Example items include “*I encourage myself to keep on writing when I feel like giving up*”, and “*I tell myself not to worry when taking a writing test or answering writing questions*”. These items adapted from Teng and Zhang (2016) were distributed across three distinct factors: ‘Interest Enhancement’ (4 items), ‘Motivational Self-Talk’ (8 items), and ‘Emotional Control’ (03 items). In contrast, in the present study, all motivational items were loaded onto a single factor. Therefore, we labelled this factor as ‘Motivational Regulation’, a term consistent with the extant literature (Teng & Zhang 2016). PCA revealed that eight of the ten original motivational items were retained within the motivational regulation factor. Additionally, the item “*I try to improve my English writing based on teacher feedback*”, which Teng and Zhang (2016) had categorized under the ‘Feedback Handling’ factor within social dimension was loaded onto the ‘Motivational Regulation factor in this study. This indicates that the learners perceive teacher feedback as a motivational resource rather than merely a feedback mechanism. The internal consistency of this factor was high, with a Cronbach’s alpha of .89.

The second extracted factor, consisting of five items explained 6.75% of the total variance.

These items pertain to strategies for the effective generation of written texts and describe how ESL learners construct written texts accurately and coherently by utilizing strategies such as checking grammar, ensuring content relevance, and using cohesive devices. Of the nine text-generating items adapted from previous studies (Bai, Wang & Zhou 2021; Teng & Zhang 2016; Wang & Bai 2017), only five were loaded onto the second factor in the present study. Examples of these items include *When writing, I check spelling and punctuation; when writing, I check grammar mistakes; when writing, I use sequence markers to make connections among sentences and paragraphs; when writing, and I pay attention to the English language structure while writing.* Accordingly, this factor was labelled “Text Generating” under cognitive dimension, aligning with the extant literature (Bai, Wang & Zhou 2021; Teng & Zhang 2016; Wang & Bai 2017). This factor demonstrated high internal consistency, with a reliability coefficient of $\alpha = .83$.

The third factor consisting of four items, accounted for 5.68% of the total variance. These items describe how ESL learners collaborate with their peers during L2 writing tasks. Specifically, this factor included items such as “*I work with my peers to complete the writing activity*, and “*I try to improve my English writing based on peer feedback*”. Accordingly, this factor was named ‘Peer Learning’ under the social dimension, consistent with the findings of previous studies (Teng & Zhang 2016). In the current study, three items used in Teng and Zhang’s (2016)

study were similarly loaded onto 'Peer Learning' factor. Additionally, one item, "*I try to improve my English writing based on peer feedback.*", which was previously loaded onto 'Feedback Handling' in Teng and Zhang's (2016) study, was also loaded onto this factor. This indicates that learners rely on peers to clarify complex questions, grammar rules, and vocabulary. Given that peer support is available during classroom writing activities, learners seek assistance in different ways. This factor also demonstrated a high-reliability coefficient ($\alpha = .84$).

The fourth factor, which accounted for 4.83% of the total variance across five items, was associated with the behavioural aspects influencing L2 writing performance among ESL learners. These items describe strategies employed by ESL learners to create more opportunities for using their L2 writing skills in authentic contexts, including both print and electronic media. Four items, *I write letters in English*, *I write in blogs (personal websites) in English*, *I send emails in English writing*, and *I send text messages in English* adapted and modified from Wang and Bai's (2017) study, were similarly loaded onto this factor in the present study. Hence, this factor was labelled 'Seeking Opportunities' under behavioural dimension in line with the existing literature (Wang & Bai 2017). However, the item, *I select interesting topics to practice English writing*, originally classified under the 'Emotional Enhancement' factor in the motivational dimension in Teng and Zhang's study (2016), was loaded into the 'Seeking Opportunities' factor under behavioural dimension. This

suggests that learners actively explore new writing activities and seek writing-related resources to maintain their interest. They perceive interactive behaviours such as seeking interesting topics or experiences for writing practice as valuable opportunities to improve L2 writing skills. Hence, this strategy reflects an active behavioural approach where learners seek out meaningful and effective L2 writing opportunities. The internal consistency reliability coefficient of this factor was $\alpha = .77$.

Factor five, comprising five items, explained a substantial 4.37% of the total variance. These items pertain to learners' awareness and regulation of their processes in enhancing their L2 writing proficiency. The item, *I re-read the question to help myself think of new ideas*, adapted from Bai, Wang and Zhou (2021), *I keep reading my essay and note down the mistakes that I often make in my writing*, and *When I finish my English essay, I take a break and then read it again to check whether it needs revision* both adapted from Wang and Bai (2017), and the item *When writing I remind myself to follow the plan*, adapted from Teng and Zhang (2016), were all loaded onto this factor in the present study. Accordingly, this factor was labelled 'Monitoring' under the metacognition dimension in line with previous studies (Bai & Wang 2021; Teng & Zhang 2016; Wang & Bai 2017). Similarly, the item, *I read back what I have written to help myself think of new ideas*, adapted from Bai, Wang and Zhou (2021), which was originally categorized into 'Text-Generating' factor in the cognitive dimension, was also loaded onto this factor in the present study. This finding suggests that

reading back the L2 written content is not merely a text-generative activity but also serves a monitoring and idea refining function. When learners reread their L2 writing, they may add relevant information and vocabulary while removing irrelevant content thereby engaging in self-monitoring. This factor demonstrated high internal consistency, with a reliability coefficient of $\alpha = .80$.

Factor six consisting of three items, explained 3.50% of the total variance. These three items were related to organizing and structuring the content of the text, involving purposeful planning, and organization of ideas to ensure clarity and coherence of the written task. The items, *I make sure to write a topic sentence in each paragraph* and *I make sure that the content of each paragraph supports its topic sentence in English writing*, which were initially classified under the ‘Organization and Transformation’ factor in Wang and Bai’s (2017) study, were loaded into this factor. These strategies help ensure that each paragraph includes strong topic sentence and supportive details, a crucial strategy in L2 writing. Additionally, the item, *after writing, I adjust vocabulary/words appropriately*, adapted from Bai, Wang and Zhou (2021) study and initially classified under ‘Goal-oriented Monitoring’ within the metacognitive dimension, was also loaded onto this factor in the current study. This suggests that learners perceive revising vocabulary and word choice as an important element of structuring and organizing their L2 writing, rather than merely a matter of lexical refinement. Thus, in line with previous studies (Bai, Wang & Zhou 2021;

Graham & Harris 2000; Teng & Zhang 2016; Wang & Bai 2017), this factor was interpreted as ‘Text Structuring and Organizing’. It represents a novel factor found in this study and was categorized under the cognitive dimension (See Table 2). The internal consistency reliability of this factor was $\alpha = .74$.

Factor seven comprising three items, explained 3.08% of the total variance. These items reflected key behavioural aspects of utilizing electronic media and tools to improve L2 writing proficiency. All items adapted from Bai, Wang and Zhou (2021) study and modified to fit the context of the present study, were loaded similarly onto this factor. The items included: *I believe that e-learning tools can create an effective learning environment for English writing*, *I will continue using e-learning as a tool for my future learning*, and *I use e-learning tools (E.g., ChatGPT, Grammarly, Kahoot, Duolingo YouTube.) in English writing related to the practice of e-learning tools in L2 writing activities*. These items reflect the practice of using e-learning tools in L2 writing activities. Thus, this factor was labelled “E-learning Acceptance” under the behavioural dimension, consistent with existing literature (Bai, Wang & Zhou 2021). The internal consistency reliability coefficient for this factor was $\alpha = .76$.

Factor eight with three items, accounted for 2.84% of the total variance. This factor included items related to the effective planning of ideas in essay writing. These items reflected thoughtful preparation before initiating an essay to ensure that ideas were relevant and

well-organized. Of the three items, two items, *before writing, I read related articles to help plan my writing activities*, and *before writing, I use the internet to search for related information to help with my planning*, adapted from Teng and Zhang (2016), were loaded similarly onto this factor. The third item, *I recall of ideas that I have read in books or others' essays and use them in my writing*, adapted from Bai, Wang and Zhou's (2021) study which was originally categorized onto 'Memory' factor within the cognitive dimension was also loaded into this factor in the present study. This indicates that retrieving and

incorporating prior knowledge into L2 writing is closely related to the planning process, in L2 writing, which is a major component of the metacognitive dimension. Accordingly, this factor was labelled 'Idea Planning' under the metacognitive dimension aligning with previous studies (Bai, Wang & Zhou 2021; Teng & Zhang 2016). Although the internal consistency reliability coefficient for this factor was slightly below the commonly accepted threshold ($\alpha = .67$), it was retained due to its conceptual relevance and its proximity to the acceptable range.

Table 3. Descriptive Statistics

Factor No.	Factor	Mean scores	SD	Skewness	Kurtosis	Number of Items	α
1	Motivational dimension Motivational Regulation	5.08	.94	-.69	.92	09	.89
2	Cognitive dimension Text Generating	4.88	1.03	-.57	.01	05	.83
3	Cognitive dimension Text Structuring and Organizing	4.54	1.12	-.53	-.22	03	.74
4	Social dimension Peer Learning	4.63	1.17	-.77	.63	04	.84
5	Behavioral dimension Seeking Opportunities	4.52	1.13	-.46	.06	05	.77
6	Behavioral dimension E-Learning Acceptance	5.28	1.06	-.65	.27	03	.76
7	Metacognitive dimension Monitoring	4.86	1.04	-.56	-.04	05	.80
8	Metacognitive dimension Idea Planning	4.57	1.08	-.61	.64	03	.67

Table 3 presents the mean scores, standard deviations, skewness, kurtosis, and Cronbach's alpha reliability for each factor in this study. The analysis of mean scores for the factors influencing L2 writing proficiency revealed

notable patterns in learners' use of Self-Regulated Writing Strategies (SRWS) across five key dimensions: Cognitive, metacognitive, motivational, social, and behavioural. Among these, the behavioural dimension of E-learning

Acceptance recorded the highest mean score ($M = 5.28$), suggesting that L2 learners demonstrated strong motivation to utilize e-learning tools in support of their writing activities. This was closely followed by motivational regulation ($M = 5.08$), indicating that learners actively employed various strategies to self-motivate and enhance their writing skills. All other SRWS dimensions also reported mean scores above the scale midpoint (See Table 3), reflecting a generally frequent use of self-regulatory strategies among Sri Lankan ESL learners to improve their L2 writing tasks. Additionally, skewness and kurtosis values for the data were within the acceptable range of ± 1 , indicating a normal and well-distributed dataset (Tabachnick & Fidell 2001).

3.2 Discussion

This study aimed to investigate the underlying dimensions of SRL writing strategies employed by ESL learners, develop, and validate the SRWSQ grounded in SRL theory. The 48-item questionnaire adapted from previous studies (e.g., Bai, Wang & Zhou 2021; Graham & Harris 2000; Teng & Zhang 2016; Wang & Bai 2017) was administered using a 7-point Likert scale to examine the underlying structure of self-regulated writing strategies. Principal Component Analysis (See Table 2), extracted 37 items across eight factors within five theoretical dimensions: cognitive, metacognitive, behavioural, social, and motivational. The Cronbach's alpha for the overall questionnaire ($\alpha = .94$) suggested strong internal consistency, suggesting the SRWSQ is a reliable measurement instrument.

Within the cognitive dimension, two constructs were identified in this study: 'Text Generating' and 'Text Structuring and Organizing'. These constructs reflect ESL learners' application of linguistic, discourse, and rhetorical knowledge in the production of written texts. Text generating strategies are the most important SRL writing strategies as they relate to the metalinguistic knowledge essential for writing in any language but are particularly challenging for ESL/EFL learners. These strategies help learners maintain clarity, grammatical accuracy, readability, cohesion, and coherence in their writing. Text Structuring and Organizing strategies also assist ESL learners in enhancing textual coherence ultimately contributing to well-organized writing in L2. Additionally, these text organization strategies help learners plan the structure of their writing before they begin and assist them in staying within that structure reducing the likelihood of deviating from the topic. The results found that using these strategies at a moderate level and classroom interventional studies can enhance the use of these strategies among the learners.

The metacognitive dimension included two factors: 'Monitoring' and 'Idea Planning' which were consistent with the findings of Teng and Zhang's (2016) study. 'Monitoring' focusses on resolving writing difficulties, by enabling learners to evaluate their writing processes and enhance them through strategies such as following a structured plan, revising, and reviewing drafts to identify necessary improvements. This process enhances learner autonomy by promoting awareness of strengths, weaknesses, and areas for

improvement. ‘Idea Planning’, on the other hand, facilitates the organization of writing activities through techniques such as online information retrieval, reading-based prewriting, and intertextual idea generation. Engaging with online resources and related readings assist learners in gathering relevant content and plan effectively for L2 writing tasks. The consistency in item loadings in this study similar to previous literature (Teng & Zhang 2016) suggests that these aspects are fundamental components of the metacognitive dimension. Results of this study revealed that these strategies are moderately used by Sri Lankan ESL learners indicating the necessity for classroom interventions to teach these strategies.

The behavioural dimension consisted of two constructs: ‘E-learning Acceptance’ and ‘Seeking Opportunities’ consistent with the findings of previous research (Bai, Wang & Zhou 2021; Wang & Bai 2017). ‘E-learning Acceptance’ reflects students’ use of digital tools to enhance their writing. The results also revealed that this was the most frequently used strategy category among Sri Lankan ESL learners, indicating that students are knowledgeable of various digital tools and actively use them to improve their writing skills. Similarly, ‘Seeking Opportunities’ involves students engaging in informal writing activities such as composing letters, blogs, emails, and text messages and seeking stimulating topics to improve their English writing. Many of these learners have formal email accounts affiliated with their institution connected via Moodle, which provides them

with immediate feedback. However, the results showed that *Seeking Opportunities* was the least used strategy category, though it was still moderately utilized. Encouraging students to write letters, blogs, emails, and text messages can further enhance their writing skills.

The social dimension was represented by a single construct, ‘Peer Learning’, in this study, which is partially consistent with previous research: Teng and Zhang (2016) identified an additional construct within social dimension, ‘Feedback Handling’—which was not recognized in the present study. The ‘Peer Learning’ construct reflects the role of collaborative learning and peer feedback in enhancing learners’ writing performance. Furthermore, some competent learners voluntarily support their peers, suggesting that perceived competence contributes to the use of this strategy. They tended to view peer feedback as part of a broader collaborative learning process rather than as an isolated tool for improving L2 writing. Clarifications, comments, discussions, and peer influence play a significant role in interactive learning, reinforcing the writing process through shared experiences and collaborative development. The findings also indicated that the moderate use of these strategies suggesting that explicit instruction in peer learning techniques can enhance learners’ motivation to write.

The motivational dimension included one factor: ‘Motivational Regulation’ defined by nine items that reflected strategies such as motivational self-encouragement, emotional regulation to minimize distractions during

writing, and efforts to increase interest in writing tasks. As noted by Wolters (1999), motivational regulation strategies in self-regulated learning enhance learners' cognitive engagement and sustained effort in writing activities. Results of this study revealed that participants frequently employed motivational regulation strategies. This suggests that the tertiary-level learners in the Sri Lankan ESL context are primarily driven by the importance of achieving high grades to improve their Grade Point Average (GPA). As a result, they tend to encourage themselves to persist in writing, even when they feel like giving up. They also exert to maintain a positive attitude towards L2 writing tasks despite the numerous challenges encountered in the L2 writing process. They attempt to control their negative emotions and motivate themselves to succeed in writing, recognizing it as an essential language skill for their academic and professional careers. This study also found that participants perceived teacher feedback as a significant source of encouragement for improving their writing. Thus, teacher feedback serves not only as an instructional tool but also as a motivation drive. Moreover, the positive teacher comments, rewards, appreciation, and influence motivate ESL writers to identify the strengths and weaknesses and areas for improvement in writing processes.

These results provide empirical support for the validity and reliability of SRWSQ suggesting its potential usefulness in the future research on self-regulated writing strategies in ESL contexts. Overall, the findings of this study provide theoretical support for the interactive

role of cognitive, metacognitive, behavioural, social, and motivational dimensions in the development of self-regulated writing strategies among ESL learners.

4 CONCLUSION & RECOMMENDATIONS

This paper presented the validation of a self-regulated writing strategy questionnaire designed for use in ESL contexts. The results revealed that the eight factors identified through Principal Component Analysis (PCA) reliably distinguish the cognitive, metacognitive, social, behavioural, and motivational dimensions of self-regulated writing strategies employed by tertiary-level ESL learners in Sri Lanka. Furthermore, the findings support the theoretical framework proposed by extant literature emphasizing the dynamic interplay between individual, environmental, motivational, social, and behavioral factors in the self-regulated writing process.

The validated questionnaire offers valuable pedagogical utility and can be employed by future researchers in ESL contexts to assess learners' use of multidimensional self-regulated learning (SRL) strategies and adapt them to enhance their writing performance. Simultaneously, English Language Teaching (ELT) professionals can use the insights gained from the questionnaire to promote strategy-based instruction aimed at improving learners' L2 writing abilities both within and beyond academic settings.

Given the limited availability of self-report instruments for assessing SRL strategy use in L2 writing within the Sri Lankan and broader Asian ESL/EFL contexts, this questionnaire serves as a valuable resource for researchers, educators, and practitioners seeking to advance research and practice in this domain.

This study is not without limitations. The self-report measures used in the study consist primarily of closed-ended items. Thus, future research should incorporate qualitative methods (e.g., interviews, classroom observations, and learner journal writing) to gather richer, more in-depth, and accurate insights into the self-regulatory strategies employed by learners. Additionally, the participants in this study were drawn from a single university, with students majoring in various fields of engineering technology. Although this group may reflect a cross-section of the country to some extent, the generalizability of the findings remains limited. Future studies should include participants from multiple universities, ensuring a more balanced representation in terms of gender, ethnicity, academic disciplines, and levels of study. This broader sampling approach would enhance the validity and applicability of the findings across diverse ESL learning contexts.

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