A systematic review of the relationship between motivational constructs and self-regulated learning

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Article Info	ABSTRACT
	The aim of this review was to identify the motivational constructs which were mostly associated with self-regulated learning and how these motivational constructs were related to self-regulated learning. There were 20 studies (N=8,759) met inclusion criteria for this review. In overall, the evidence of the included studies showed that motivational constructs such as self-efficacy, intrinsic goal orientation, task value, and control of learning beliefs were positively and significantly related to and in predicting self-regulated learning; test anxiety was negatively and insignificantly related to and in predicting self-regulated learning; inconsistent results were observed for extrinsic goal orientation as it could be positively or negatively related to and in predicting self-regulated learning.

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1. INTRODUCTION

Theoretically, self-regulated learning (SRL) is defined as an active process where the learners set their own goals, make use of learning strategies to plan, monitor, regulate, and appraise in terms of various aspects including cognitive or metacognitive, motivational, and behavioural to attain the target goals as cited in [1, 2]. In the context of academic learning, a number of literatures [3-5] have posited that academic achievement (AA) is positively associated with self-regulated learning (SRL). These favourable outcomes are consistent across ages as from preschool to elementary school to secondary school and even university as reported in several studies [4, 6, 7].

Notwithstanding the promising results reported in previous literature, there was also prior research which highlighted the doubts or concern over the usefulness of SRL in practice. For example, a study [8] contended that SRL interventions may not significantly increase the usefulness of SRL strategies among students beyond intervention environments or contexts. Similarly, some studies [9, 10] proposed that students might not use SRL strategies readily regardless of having the required knowledge as they didn't certain of the gains for their effort or find it difficult to execute.

Pertaining to the concern over the feasibility of practising SRL in daily life, some researchers highlighted other potential contributing factor of SRL such as motivation. For instance, Bandura [11] contended that since SRL is self-directed, thus it partly depends on the fidelity, consistency, and temporal proximity of self-monitoring which requires motivation as consistent driver; in addition, people's attentiveness fluctuates in nature due to competition of many factors concurrently, hence motivation is

necessary to direct individuals to focus on the target goal. In line with this postulation, several prior studies [12, 13] demonstrated that motivational constructs were positively linked with or predicted cognitive engagement such as self-regulatory strategies.

The aim of this review was to identify the motivational constructs which were mostly associated with self-regulated learning and how these motivational constructs were related to self-regulated learning. Hence, this study focused on six motivational constructs only, namely intrinsic goal orientation, extrinsic goal orientation, task value, control of learning beliefs, self-efficacy, and test anxiety which were proposed in Motivated Strategies for Learning Questionnaire (MSLQ) [14], the mostly used SRL instrument; as well as, included in two most extensively studied SRL models from Pintrich [1] and Zimmerman [15] for more convincing outcomes.

2. LITERATURE REVIEW
2.1. Motivational constructs

Among various types of self-regulated learning (SRL) measurement, Motivated Strategies for Learning Questionnaire (MSLQ) was the mostly used instrument till date as it comprised several key determinants of SRL to give a more comprehensive insight of SRL related behaviors. According to MSLQ [14], motivation scale section was consisted of six components, namely intrinsic goal orientation, extrinsic goal orientation, task value, control of learning beliefs, self-efficacy, and test anxiety.

In line with the motivational constructs proposed in MSLQ, the two most extensively studied SRL models, which are Cyclical Phases model by Pintrich [1], Zimmerman and Moylan [16]. showed consistency in support of this postulation. Specifically, Cyclical Phases model included four out of six motivational constructs in forethought phase, which are self-efficacy, task value, goal orientation (intrinsic and extrinsic); whereas, Pintrich's model involved all six motivational constructs including intrinsic goals, extrinsic goals, task value, control beliefs, self-efficacy, and test anxiety.

2.2. Self-regulated learning

According to MSLQ, learning strategies scale is consisted of two major sections, which are cognitive and metacognitive strategies, and resource management strategies which give a total of nine elements. Specifically, cognitive and metacognitive strategies include rehearsal, elaboration, organization, critical thinking, and metacognitive self-regulation; whereas, resource management strategies include time and study environment, effort regulation, peer learning, and help-seeking.

Alternatively, a recent meta-analysis [17] examined a number of theories underpinning self-regulated learning and proposed that some of the constructs can be combined if they fulfilled three requirements. For instance, strong interrelations, or similar patterns of correlations, or strongly related with other learning constructs. As a result, the review concluded that only nine components were predictors of SRL including goal level, self-efficacy, cognitive and metacognitive strategies, attention, time management, environmental structuring, motivation, effort, and attributions, which are categorized as weak, moderate, or strong predictors.

Apart from that, the SRL components proposed by Sitzmann and Ely [17] showed consistency with the two SRL models. For instance, six of nine elements were also included in Cyclical Phases model [16]; they were goal setting, self-efficacy, goal orientation (motivation), time management, environmental structuring, and metacognitive strategies (self-monitoring and self-evaluation). Similarly, eight out of nine elements were in line with Pintrich's model [1]; they were goal setting, metacognitive strategies (self-monitoring and self-evaluation), goal orientation (motivation), efficacy judgments (self-efficacy), effort regulation, time planning, study environment, and attributions.

3. RESEARCH METHOD

An extensive search was performed using several databases such as EBSCOhost, SAGE Journals, Scopus, Web of Science, ScienceDirect, and Springer. The entire process of literature research was summarised in Figure 1 including keywords used, specific conditions applied, and the stages of screening process.

In addition, inclusion criteria were also established for this review. First, only studies published within the year range of 2010-2019 will be considered to give the most recent research trends. Second, only SRL related studies in school context will be considered. Third, only studies investigating the relationship between motivational constructs and SRL will be considered. Fourth, all levels of education are considered for this review from elementary to secondary until higher education across the globe for generalization to academic learning. Participating students are from mainstream educational institutes which do not suffer

from any learning disabilities, but should be representative for the general school community. Lastly, only published articles, journals, proceedings, or conference papers are considered for this review.
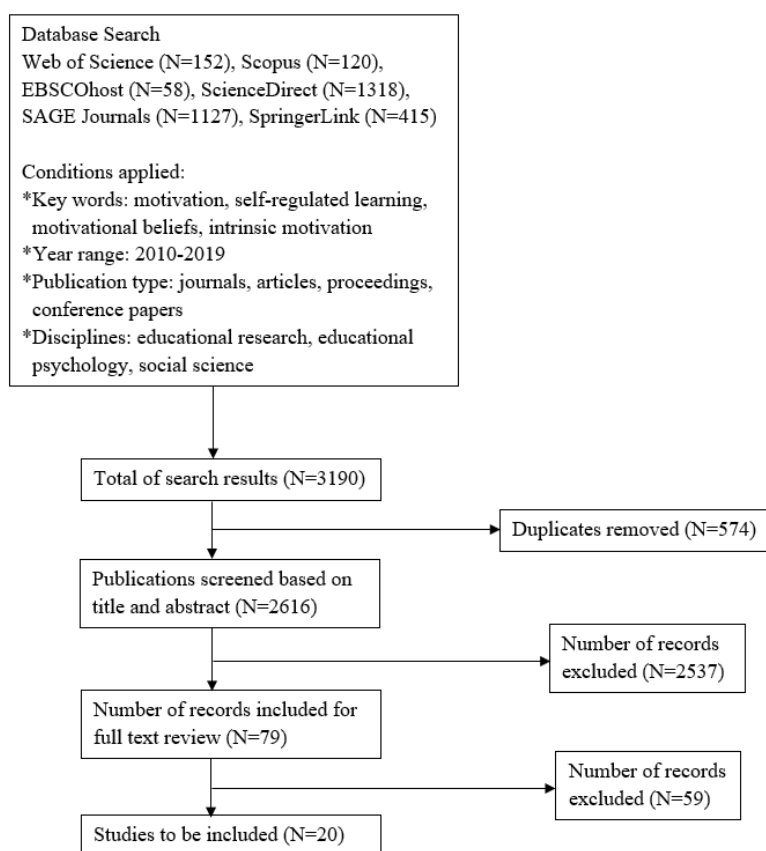

Figure 1. Flow of information through the different phases of a systematic review

4. RESULTS

Each of the motivational constructs was compared in terms of their association with self-regulated learning. In addition, the relationships of these motivational constructs and self-regulated learning components were also presented.

4.1. Comparison among motivational constructs

A total of twenty studies was included for this review after stages of screening process. Though the of motivational constructs examined in each study were different, inferences can be drawn from the research findings that there were six motivational constructs which were frequently linked to SRL. They were self-efficacy, task value, intrinsic goal orientation, extrinsic goal orientation, control of learning beliefs, and test anxiety.

Among the motivational constructs, self-efficacy appeared to be the most widely investigated as reported in seventeen studies (n=17/20) followed by intrinsic goal orientation which was reported in eleven studies (n=11/20). Task value and extrinsic goal orientation were examined in nine (n=9) and eight studies (n=8/20) respectively. Finally, test anxiety and control of learning beliefs were the least studied motivational constructs by researchers which were reported in six (n=6/20) and five studies (n=5/20) respectively. In brief, self-efficacy and intrinsic goal orientation were the two motivational constructs which were most frequently associated with self-regulated learning (SRL).

4.2. Relationship between motivational constructs and SRL components

The research findings were presented in the descending popularity of motivational construct; they were self-efficacy, intrinsic goal orientation, task value, extrinsic goal orientation, test anxiety, and control of learning beliefs as summarized in Table 1.

Table 1. Summary of research findings of the included studies

Motivational constructs	Type of relationship examined	Results
Self-efficacy (n=17)	1-Correlation between self-efficacy and SRL (n=6)	1-Significant and positive relationship was observed in several studies [18-22].
	2-Effect of self-efficacy on SRL (n=6)	2-Self-efficacy had significant and positive impact on SRL as reported in several studies [23-27]
	3-Effect of SRL on self-efficacy (n=1)	3-SRL had significant impact on self-efficacy as reported in a study [28]
	4-Reciprocal effect between self-efficacy and SRL (n=1)	4-Reciprocal effect was observed in a study [29]
	5-Roles of self-efficacy, SRL, or grade goals as mediators in the relationship between the other two remaining variables (n=3)	5-self-efficacy mediated grade goals as reported in a study [30]; grade goals were significant mediator between self-efficacy and SRL as reported in a study [31]; effort regulation partially mediated self-efficacy and GPA as reported in a study [32]
Intrinsic goal orientation (n=11)	1-Effect of intrinsic goal orientation on SRL (n=7)	1-Intrinsic goal orientation had significant and positive impact on SRL as observed in most studies [25-27, 31, 33, 34],
	2-Effect of SRL on academic motivation including intrinsic goal orientation (n=1)	2-SRL had significant impact on academic motivation as reported in a study [28]
	3-Correlation between intrinsic goal orientation and SRL (n=3)	3-Intrinsic goal orientation was positively linked to SRL as reported in some studies [19, 35, 36].
Task value (n=9)	1-Effect of task value on SRL (n=6)	1-Task value significantly predicted SRL as observed in most studies [23, 26, 30, 32]
	2-Mediator roles of task value and SRL (n=2)	2-Task value was significant mediator between self-efficacy and SRL as reported in a study [24]; SRL significantly mediated the control of learning beliefs and task value as reported in a study [37]
	3-Correlation between task value and SRL (n=1)	3- Task value was positively and significantly linked to SRL as reported in a study [22]
Extrinsic goal orientation (n=8)	1-Effect of extrinsic goal orientation on SRL (n=5)	1-Extrinsic goal orientation was negatively related to SRL as reported in some studies [25, 33]; Extrinsic goal orientation positively predicted SRL as observed in several studies [26, 32, 34]
	2-Correlation between extrinsic goal orientation and SRL (n=2)	2-Extrinsic goal orientation was negatively associated with SRL as observed in a study [19]; Extrinsic goal orientation was positively associated with SRL as reported in a study [36]
	3-Effect of SRL on extrinsic goal orientation (n=1)	3-SRL had a positive and significant impact on the academic motivation including extrinsic goal orientation as observed in a study [28]
Test anxiety (n=6)	1-Correlation between test anxiety and SRL (n=3)	1-Test anxiety was insignificantly or negatively linked to SRL as observed in some studies [18, 22, 32]
	2-Effect of test anxiety on SRL (n=3)	2-Insignificant or negative effect of test anxiety in predicting SRL as observed in some studies [25, 26]; Test anxiety was significant and positive predictor of SRL as reported in a study [27]
Control of learning beliefs (n=5)	1-Effect of control of learning beliefs on SRL (n=3)	1-Control of learning beliefs significantly and positively predicted SRL as reported in some studies [26, 32]; control of learning beliefs was not significant predictor of SRL was observed in a study [25]
	2-Correlation between control of learning beliefs and SRL (n=1)	2-Control of learning beliefs were moderately associated with SRL as reported in a study [18]
	3-Mediator role of SRL between motivational constructs (n=1)	3-SRL significantly mediated control of learning beliefs and task value as reported in a study [25]

5. DISCUSSION

This research aims to identify the motivational constructs and SRL components contributing to a more inclusive SRL as well as the interaction between these two groups of variables. Through a systematic overview of research, several inferences were extracted from the included studies.

First, self-efficacy was positively and significantly in relation with as well as in predicting SRL as proposed by most studies [18-22] regardless of some inconsistencies. Alternatively, some weak evidence [23-27] suggested that SRL could have positive and significant impact on self-efficacy; some studies [30, 31] proposed that self-efficacy or grade goals can be significant mediators in mediating the relationship between self-efficacy, grade goals, and SRL.

Second, strong evidence [25-27, 31, 33, 34] indicated that intrinsic goal orientation was positively and significantly in relation as well as in predicting SRL. On the other hand, another study [28] revealed that SRL can have positive and significant effect on academic motivation including intrinsic goal orientation.

Third, most studies [23, 26, 30, 32] concurred that task value was positively and significantly in relation as well as in predicting SRL. Similarly, some other research [24, 37] demonstrated that task value can be significant mediator in mediating the relationship between different motivational constructs.

Fourth, existing literature showed contradictory results on the relationship between extrinsic goal orientation and SRL till date. Specifically, a number of prior evidence [25, 26, 32-34] revealed that extrinsic

goal orientation can be positively or negatively associated with or in predicting SRL. On the other hand, there was weak evidence [28] which demonstrated that SRL can be positive and significant predictor of academic motivation including extrinsic goal orientation.

Fifth, test anxiety and control of learning beliefs are the two least motivational construct studied in relation to SRL till date. Pertaining to test anxiety, strong evidence [18, 22, 25, 26, 32] indicated that test anxiety is insignificantly and negatively associated with or in predicting SRL. Concerning the control of learning beliefs, most studies [26, 32] concurred that control of learning beliefs were positively and significantly related to or in predicting SRL regardless of some inconsistencies. On the other hand, there was weak evidence [25] which proposed that SRL can be significant mediator between control of learning beliefs and other motivational constructs.

Overall, self-efficacy and intrinsic goal orientation emerged to be the two mostly and significantly associated with self-regulated learning. This evidence was supported by the postulation that self-efficacy was a key personal determinant in Social Cognitive Theory (SCT) which underpinned the Triadic Analysis model by Zimmerman [2]. Since it was characterized as the judgements of own competences to perform a particular task, therefore self-efficacy was believed to have significant impact on affect, performance, persistence, learning, and effort as suggested in some studies [38, 39].

Similarly, Bandura [11] contended that since SRL was a self-directed process, therefore it partly depended on the fidelity, consistency, and temporal proximity of self-monitoring which required motivation as consistent driver. Thus, intrinsic goal orientation was particularly useful in motivating learners to accomplish tasks which they perceived as difficult or boring as proposed in some studies [40, 41]. The remaining motivational constructs were moderately linked to SRL based on the included studies.

6. CONCLUSION

In overall, this research had explicitly demonstrated how each motivational construct was related to SRL components. The strength and direction of the relationship among variables were also indicated to provide insights for future work. Specifically, self-efficacy, intrinsic goal orientation, task value, and control of learning beliefs were positively and significantly related to and in predicting self-regulated learning; test anxiety was negatively and insignificantly related to and in predicting self-regulated learning; inconsistent results were observed for extrinsic goal orientation as it could be positively or negatively related to and in predicting self-regulated learning.

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