

# Strategies for Promoting Self-Regulation in online Learning Environment: An Analytical Review

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## Abstract

Self-regulated learning (SRL) is a style of academically effective learning in which students must set goals and develop strategies before beginning to learn. Learners must monitor and regulate their cognition, motivation, and conduct, as well as reflect on their learning process, under this pandemic environment. Online learning is catalyzing a pedagogical shift in how we teach and learn. There is a shift away from top-down lectures and passive learners to a more participatory, collaborative approach in which students and teachers co-create the learning process. Instructors should use the right method to ensure that their students can benefit from the online learning environment. In this study, we acquired, summarized, and analyzed 45 publications published between 2012 and 2021 on diverse subjects relevant to SRL, with a focus on SRL techniques and problems in an online learning context. In order to provide a thorough study, this review incorporates many models, phases, and a few extra SRL-related subjects.

**Keywords:** Self-regulated learning, Online-learning, Dimensions, Strategies, Environment.

## INTRODUCTION

The present prevalence and expanding use of student-centered learning environment highlights a number of potential and associated problems for today's learners, Lang et al. (2017). There are several challenges faced by teachers during the teaching learning process, as evidenced by the increased availability of online courses like MOOCs. These oftentimes self-paced, open-ended, & non-linear learning settings, which are abundant in their offering, necessitate the application of numerous self-regulatory processes, such as: recognising gaps in one's knowledge, making decisions regarding one's learning requirements, effective time management in how and when to study, planning, reflective practices, and continuous desire to accomplish the work effectively, Rafferty & Rowe (2013).

However, it is widely established that in obtaining this autonomy and the extra responsibility of taking care of one's learning, several students fail to adopt basic methods, Rafferty & Rowe (2013). Personalized

interactions between educators and learners, may be lacking in tech-grooming learning, Arkorful et al. (2014). This has a detrimental impact on learners' satisfaction, motivation and achievement in digital learning, Arkorful et al. (2014). Furthermore, keeping student involvement in digital learning has been proven to be problematic, Henrie (2015). As a result, the efficacy & accomplishment in digital learning are dependent on students' capacity to govern their learning process. SRL is a good process in which students take charge of their own education while being meta cognitively led by their own motivation, Zimmerman (1900) & Pintrich (2000). LMS is being utilized by many institutions of higher learning for fully or blended web - based learning, Luna et al. (2017), Bogarn et al. (2018). Learning Management Systems (LMSs) focus on making students active participants in the learning process by not only supplying learning resources to students but also creating an atmosphere conducive to successful interaction in the learning process. It's crucial to evaluate the LMS's utility in assisting students in taking charge of their

knowledge & ensuring that they are effective in supporting SRL techniques. Previous study on learners' perceptions of e-learning shows that self-regulated learning methodologies are not integrated with Learning Management system quality, Vovides et al. (2007), Muuro et al. (2014), Back et al. (2016,). As per the literature, there is little empirical data on how LMS features help students improve their self-regulation skills. SRL requires students' willingness as well as skills. Therefore, educators should assist learners to become conscious of their own thoughts, and be strategic and motivated to achieve a precious goal. This requires students to be active and self-regulated. The purpose of this review article is to encourage and assist students in developing their ability to establish their goals, prepare tactics, enhance self-awareness, self-directed and encourage help-seeking behaviour.

#### What is Online Learning?

The phrase "online learning," also known as "web-based learning," "e-learning," and "digital learning," refers to a type of remote education that incorporates web-based resources and exercises. Students in the digital era tend to be more self-reliant, technology disciplined, and tech-savvy, making them well-suited to the online world and to use technology tools that may be necessary, students must be digitally competent. Despite the many benefits of online learning, there are still challenges in dealing with current literature that must be addressed. Firstly, the learners doing online learning receive sufficient guidance and support, Kizilcec, et al. (2017), Terras and Ramsay (2015). Our needs are to take use of the opportunities provided by EDM (Educational Data Mining) and LA (Learner Analysis) technologies in order to provide suitable advice and assistance to online students. The EDM is defined as a way of employing data mining algorithms on data sets created by learning environments as a means of comprehending students and learning settings. Datasets in log form can also be analyzed in order to release information that can be utilized as indicators for interventions that decrease drop-offs, enhance retention rate & develop bright students, Romero and Ventura (2013) Romero & Ventura (2012) Arnold & Pistylli, (2012), Romero et al. (2013) On the other hand, data gathered from educational settings are integrated and analyzed

for seeking patterns and insights as far as how students interact with teaching and learning activities while participating in online learning. The main goal is to help students eliminate undesired learning habits and develop good learning habits through interventions, Lodge et al (2019). Lodge & Corrin (2017) feel that learner analysis provides an opportunity for student learning to track their behavioural patterns and deliver on-line interventions in specific. The results of LA are helping to understand the behaviour of pupils in order to provide early intervention mechanisms that increase the learning commitment that was found to be associated favorably in academic performance, Naif, Ayman & Saeed-ul (2019). This will lead to fewer dropouts and increased retention rates, especially among higher education students. Learning analysis is much more concerned with analysing and reporting insights in data on learning and learning settings, focusing on "inform and empower" insights. While EDM is concerned with techniques for exploring information from educational settings and using techniques for understanding learners and learning environments, with automated information finding, learning analysis is much more concerned with analysing and reporting insights in data on learning and learning settings, Siemens & Baker (2012). Even in a traditional classroom, when students are bound together for specific periods of time, online students are free to manage their own schedules and learning processes, including when and how long they study. It is vital for students to be able to control their own learning process for the success of e-learning, Nikolaki et al. (2017) and as a result, students should incorporate self-regulated learning into their learning process.

#### Let's analyze Self-regulated learning

The philosophy of Self-regulated learning describes how students can direct their own education. They are the individuals who can manage their own learning and take an active role in achieving their academic objectives. Self-regulated learning is founded on several theoretical models that serve as frameworks for SRL research investigations, Zimmerman et al., 2017. Each model describes stages, processes, and components of a learning process that, when combined, can be summed up as SRL techniques such as cloud time management methods, metacognition, effort control, critical thinking,

practice, planning and, pair to pair learning. Learners who utilize some or all of the defined methods do better than those who have poor SRL, and thus need help, particularly in E-learning environments that are utilized mostly by higher education Kizilcec et al. (2017), Broadbent & Poon (2015), Littlejohn et al. (2016). These approaches may be monitored for each SRL model during the learning process. The SRL measurement is thought to have experienced what is termed as 'three waves, Panadero, Klug, and Järvelä, (2016). These waves are defined as the first wave when self-regulation was conceptualized by learner characteristics and thus quantified using self-reporting techniques such as interviews and surveys. SRL is defined in the second wave as internal occurrences or processes that are influenced by the external environment in which learning occurs. The methods for measuring SRL in the second wave, which used online SRL, enable measurement without the learner's knowledge. This is accomplished through the use of log data collected from students, teachers, and collaborators interacting with the learning environment. The third wave is referred to as the "present wave," and SRL assessment techniques are used to improve or strengthen students' self-regulation abilities.

This SRL model, Zimmerman (2000) has been prepared to help pupils learn to work independently. This paradigm can be put into three phases called planning, execution, and self-reflection also termed as forethought, performance, and self-reflection.

**Zimmerman’s Cyclical Phases Model**

This SRL model is divided into three broad phases: forethought, performance, and self-regulation. During the forethought phase, learners evaluate their work activities, set ultimate objectives, and establish strategies to attain them, but certain uplifting beliefs influence these processes as well as impede the activation of learning strategies. During the performance phase, learners carry out their tasks while supervising their progress and employing specific methods to keep themselves mentally engaged and interested to complete the task. Finally, during the self-reflection phase, students compare their performance and make moral judgments about their strength or weakness. These attributions aggravate consciousness that can impact how students approach the task in subsequent performances, either positively or negatively.

**Phases of self-regulation**

<b>FORETHOUGHT</b>	<b>PERFORMANCE</b>	<b>SELF-REFLECTION</b>
Task-analysis	Self-control	Self-judgment
Goal-setting	Self-instruction	Self-evaluation
Strategic-planning	Imagery	Causal attribution
Self-motivational beliefs	Attention focusing	Self-reaction
Self-efficacy	Task-strategies	Self-satisfaction
Outcome expectations	Self-observation	Adaptive-defensive
Intrinsic interest	Self-recording	
Values	Self-experimentation	
Goal-orientation		

**Forethought Phase**

In self-regulated learning, the forethought phase outlines the mechanisms through which pupils

try to devise strategies for completing a task or reaching a goal. (consider Table 1).

<b>Processes</b>	<b>Description</b>
Goal Setting	Short-term objectives are established by self-regulated learners as proximate pathways to longer-term goals.
Strategic Planning	Self-regulated learners employ techniques for directing behaviour, regulating affect, and guiding cognition.
Self-Efficacy	Self-regulated students believe they are able to reach their long- and short-term goals.
Outcome Expectancies	Self-regulated students think that the task at hand is reasonable and feasible.
Task Interest/Value	Self-regulated students' faith on work they are doing is interesting & worthwhile.
Goal Orientation	Self-regulated students are focused on achieving mastery.

#### Performance Phase

The performance phase explains the procedures that students use for completing a task or reaching a goal. (Consider Table 2).

<b>Processes</b>	<b>Description</b>
Task Strategies	Self-regulated learners employ specific strategies to complete the task at hand.
Volition Strategy	Self-regulated learners devise novel approaches to completing the task at hand. Students who are self-regulated use methods to sustain their elevated amounts of volition.
Self-Instruction	Statements are used by self-regulated students to focus on mastery goals rather than performance goals.
Imagery	Mental pictures are used by self-regulated learners to arrange knowledge and focus attention.
Time Management	By avoiding procrastination, self-regulated students effectively manage their time to complete the tasks.
Environmental Structuring	Self-regulated students seek guidance from those who are more knowledgeable.

Help-Seeking	Self-disciplined students alter their physical environment to make it more favorable to accomplishing the task.
Interest Enhancement	Difficult activities are viewed as challenges by self-regulated learners.
Self-Consequences	Self-regulated learners establish pros and cons for themselves.
Metacognitive Monitoring	As they work toward their objectives, self-regulated learners keep note of their ideas.
Self-Recording	Self-regulated students keep track of their own progress in a suitable period of time.

### Self-Reflection Phase

During this phase, students look at their progress toward the task or objective, or on the outcomes if they have finished their tasks. (See Table 3).

Processes	Description
Self-Evaluation	Self-regulated students evaluate their performance both during and after the activity.
Causal Attribution	Failures are not blamed on uncontrolled variables like ability among self-regulated learners. They blame failure on a lack of effort instead.
Self-Satisfaction/Affect	Failure does not discourage self-regulated learners, and success brings them pleasure.
Adaptive/ Defensive	Self-regulated students do not get defensive protection when faced with failures due to uncontrolled factors; instead, they become adaptable and try to do better in the future.

### PINTRICH'S COMPONENT-ORIENTED MODEL OF SRL

By Pintrich (2000), Self-regulated learning is characterized as “a dynamic and helpful handle in which learners set goals for their learning, at that point endeavor to screen, control their cognition, inspiration and conduct, guided and connected by their destinations and relevant characteristics of the environment”. Pintrich's model includes four phases and four components, that lead to various self-regulatory

processes. These phases are as follows: (1) planning and setting objectives, (2) self-monitoring, (3) self-control (4) self-reflection. These phases are also superimposed by four components: (1) cognition, (2) motivation (3) behaviour (4) context.

#### Component of SRL

The SRL's components allow for the identification of process differentiating learning from the following SRL:

Metacognition	Goal setting, planning, self-monitoring, organizing, and self-assessment all are covered in this section. These are abilities that need intrinsic knowledge and self-awareness in order to keep track of one's cognitive processes and regulate them (Kauffman; 2004, Whipp & Chiarelli; 2004).
Motivation	This component encompasses intrinsic task motivation and activation, strong self-efficacy (belief and confidence in task completion/accomplishment), and self-attributions, which was previously considered a critical issue in educational achievement (Zimmerman & Schunk, 2001).
Behavioural	This component addresses the characteristics that target learning practices such as help-seeking, self-observation, and time management, among others.
Cognition	Information strategies (exploration, choosing, acquisition, and processing of content), problem solving, memory, and other learning processes are covered in this component.
Context (social and environmental)	This component includes tasks like task evaluation, monitoring, and restructuring, as well as modifying the activity's context.

These components interact throughout the phases, resulting in unique self-regulation processes or methods used by students.

### Methodology

Researchers investigate the topic covered in SRL research. Several issues were found as being covered throughout our investigation which is related to SRL framework and phases, learner SRL strategies, and self-regulation in online learning contexts. Researchers conducted a systematic analysis and evaluation of SRL research in two stages. First, we gather connected articles, and then we analyze the SRL in an online learning context.

SRL research was published in several journals, hence we explored more than 45 articles (2012–2021) of random journals. We explore many journals which are related to SRL, online learning. These articles were explored through Google Scholar, Scopus, ACM Digital Library, UiTM's library, EzAccess, IEEE Explorer, Springer Link and Science Direct.

Reflection of this review has been discussed in the results section using the SRL model and stages. Although various researchers developed many types of SRL models, all of them are considered to be cyclic processes. Learners that use these models to enhance their learning

performance should keep the process continuing in a circle. We explored some strategies like cognitive, metacognitive, self-efficacy or motivation, behaviour, and resource management proposed by researchers for the learners to use.

### Strategies for Fostering Student Self-Regulated Learning in Online Environments

#### Instructor Strategy 1: Teaching Self-Regulation Learning Strategies

Teaching Learning Strategies for Self-Regulation in online learning may be useful for students who have difficulties in attending the physical classroom. Teachers might consider developing their own online readings, videos, or links to resource bases that discuss the significance of self-regulation and how to prosper in online college education, Hu & Driscoll (2013). Goal setting, time management, test preparation, and online note taking techniques are examples of SRL topics that could be investigated, Dabbagh & Kit.

The majority of learning management systems (LMS) allow teachers to upload videos that discuss subject. Written information may be beneficial. As part of their grade, students should be expected to watch these modules. To ensure that students have viewed the information, instructors may have them

complete certain questions or evaluations based on the modules. Information from the questionnaire or exams may aid in identifying students who are at risk of failing or not completing the course on time. Instructors may also choose to deal with students who exhibit a lack of self-control, confidence, or expertise and offer them appropriate advice. Examples of such advice include the importance of study time, the amount of work required to succeed in a course, and an offer to assess their course progress on a regular basis.

Students may not be aware of self-regulation modules or portions of a course, Dabbagh & Kitsantas (2005). A history student may not see the benefit of going through these modules in preparation for the online classroom. As a result, students may disregard the module and fail to think through the issues at hand thoroughly, Hu & Driscoll (2013). Faculty should emphasise the function and value of these modules throughout the course, Dabbagh & Kitsantas (2004).

#### Instructor Strategy 2: Using Study Logs

Students who are required to maintain a log of their academic performance may be more likely to influence their SRLs, Dignath-van t al. (2000) & Buttner (2015). Students can enter and track their study habits by creating an online Google sheet or Google form, or other data entry component, Chang (2007). Learners can use logged data to reflect on their efforts in the programme and can change their efforts if they are not meeting their educational objectives. This approach focuses on helping students with aspects of self-regulation, specifically self-assessment, Campillo and Zimmerman (2003). Learners who can keep track of their progress will have a good understanding of the relationships between their work and their outcomes, Chang (2007).

#### Instructor Strategy 3: Encouraging Students to Self-Regulate

Students should be encouraged to manage their own behaviour. Self-control encouragement is more effective when applied throughout the semester rather than just at the beginning (Ely & Sitzmann, 2010). Encouraging learners to consider their actions in terms of their classes will serve as a reminder of what is expected of them in class. This approach emphasizes the forethought phase of self-control, which helps students to plan ahead of time how they will

approach a lesson (Campillo & Zimmerman, 2003). It is also a fantastic approach to aid children in establishing personal goals (SC hunk et al., 2014).

Educators should give students brief evaluation (no more than 3–4 questions) at the beginning and completion of each module, once a week, or during any frequent formative assessment.

The following questions were used by Sitzmann and Ely (2010):

- i. Can I put all of my effort towards studying the material?
- ii. Have I grasped all of the material's main points?
- iii. Are the study techniques I'm employing assisting me in learning the training material?
- iv. Am I establishing goals to ensure that I fully comprehend the training material?
- v. Do I have adequate knowledge of the content to correctly answer the questions on the following module's assessment?
- vi. Is it true that I'm concentrating on my studies?

Consistently encouraging students for self-regulation necessitates extensive and meticulous strategizing, Sitzmann & Ely (2010). There are a few minor but important factors to consider, such as data collection methods such as conducting searches and surveys and information availability which are available to students/ professor/ class etc. Despite the extensive planning, the time spent by students and faculty may pay off handsomely in terms of student persistence and success Sitzmann & Johnson, (2012).

#### Instructor Strategy 4: Text Message Reminders

Course and student demography may be advantageous to learners to remind them of their work outside of the online learning environment or LMS. This might be especially advantageous for learners who don't spend enough time online or get poor marks. This method doesn't work in an online learning environment, but connecting outside the classroom might help students who have difficulty controlling their time achieve their goals, Lauricella & Kay (2013). Students in the performance phase of self-regulation might be influenced by text message reminders. This

approach, in particular, can help students improve their time and task management skills by assisting them in focusing on what needs to be accomplished in the course.

Using a variety of text message reminder services, instructors can contact students via their mobile phones. Working with college students enrolled in the course using Remind's, Remind, Inc. (2015) free education account is one option. Students who opt in will begin receiving course notifications and updates. The trainer can schedule appointments throughout the semester using the simple navigation panels. The time commitment is minimal, and communicating with students in ways other than email can help open up communication channels about the course.

Reminders for crucial dates (e.g., impending examinations or assignment due dates), emphasis on a certain topic that should be selected or concentrated on, reminders for office hours, or simply encouraging messages could all be used with text message reminders.

#### Instructor Strategy 5: Scaffolding

Scaffolding is a word that relates to the provision of support mechanisms to assist students in their learning, Choi, Land, & Turgeon (2005). Scaffolding might inspire students to seek assistance or to approach their course learning in new ways. It may also enhance the learning experience by allowing students to go deeper into the subject or study areas that interest them. Scaffolding may be especially useful during the performance phase, notably in the task methods, time and resource management, interest development, and finding assistance.

Scaffolding can take many forms, some of which are outlined below.

- Creating a framework for time expectations. For students taking online courses, procrastination can be a big issue, Michinov, Brunot, Le Bohec, Juhel, & Delaval, (2011).

- If big projects are scaffolded across several days or numerous sub assignments, students will be forced to complete every comment section prior to the overall project's completion. If learners are expected to write a research paper, the educator may request an outline, a bibliography, & many rough versions

before the final paper is due. The issue with this method is that it requires more work from the educator.

- As they tie the rubric to their intended grade, a clear rubric may help students set objectives for themselves. The grading rubric might benefit from this scaffolding strategy, Dabbagh & Kitsantis (2005).

- Create a collaborative discussion support framework. For example, encourage the learners of various levels to pose collaborative questions to one another. As a result, there will be more discussion and inquiry about class material among students, Choi et al. (2005).

- Educators outperformed standard static films in terms of learning outcomes, Delen, Liew, & Willson, (2014). These kinds of improvements come in a wide range of styles.

- There are several points to be considered because scaffolding may be time-consuming. Scaffolding may take many different shapes in different contexts, teachers should try out different scaffolding approaches to see what works best for their teaching styles.

- As a form of "handholding" with students, some scaffolding is used. Others may argue that it is the student's responsibility, for example, to set due dates for assignments over the semester.

- As part of an online collaboration, real-life examples of work that earned good grades might help goal-setting and self-evaluation.

- Emails and other communication features enable learners to communicate with each other when they require assistance but do not feel the need to talk with the instructor.

- Online forums are also offered for the organisation of study or other types of cooperation, as well as a space for students to investigate other views while enrolled in the course, Kitsantas & Dabbagh (2005).

- This kind of effort could help students learn more in their online class. Consider making links to services in areas where students have had difficulty in the past. Consider pointing students to YouTube videos that demonstrate a variety of approaches to the subject. Also, try to connect students to outside resources that will



inspire them to take a different approach to the material or bring new ideas.

### Findings

A self-regulated learning promotion or intervention is defined as any activity or occurrence that may "promote SRL growth" in an online learner during a learning episode. SRL approach assessments seek to determine students' SRL levels, whereas SRL interventions

seek to increase or accelerate learners' intrinsic SRL skills development, Triquet, Peeters, and Lombaerts (2017). Following a content analysis of the 45 studies examined in this study, twenty publications were discovered that described SRL strategy techniques that also served to promote SRL, and the summary is shown in the table below.

### Summary of the review literature

<i>Authors</i>	<i>Descriptions</i>
J. Xu, (2021)	This review shows educational significance. First, while online WCF is typically well-accepted by students with feedback-seeking mind-sets. It may be used as a complement to persons in English writing programmes in the post-COVID-19 age. Second, teachers should give direct or indirect advice on how to apply SRL writing techniques during the writing process, including examples and scaffolding.
Kim Dongho et al., (2021)	This review indicated that student video involvement increased over time, with student management techniques contributing to the increasing trend. Findings also provide insight on instructional techniques for assisting students in AOL (Asynchronous Online Learning) environments. In this study, the authors used multimodal data to triangulate the findings by taking into consideration student actual actions and student opinions about their learning techniques, as well as academic records and demographic information.
Jr. Allen Carter Richard, (2020) Kim Dongho et al., (2021)	This review identified and discussed strategies for meeting the needs of students in a digital learning environment. The primary methods identified in this study include encouraging students to evaluate how they learn online, providing pacing assistance, measuring involvement, and assisting families.
Jaclyn Broadbent et al., (2020)	This review concluded that the learner is the greatest actor in the control of learning. While instructors could use the possibility of technology to enhance their SRL, it should be remembered that it should ultimately be the student's responsibility for self-regulation. Technologies can open only to students; they are unable to self-regulate even if we are strongly distributed on the function of machines in this. They are not able to regulate themselves.
Yue Zhu (2020)	This review shows how people's views about online learning have changed over time, as well as the links between their self-regulated learning capacity, online interactions, attitude, and web - based learning purpose. Students' views toward online learning were typically favorable and improved after the course was completed; and (b) 4 self-regulatory characteristics and perspectives, facilitated by online social interactions, predicted students' sustained motivation to study online.

Wang Wei & Zhan Ju, (2020)	According to the findings of this study, learner beliefs about being well-protected while learning in society had a negative impact on online self-regulated learning. Motivation for online English study acted as a moderator in these relationships. Higher levels of self-efficacy and perceived value of English learning improved learning motivation and self-regulation, according to the findings.
Araka Eric et al., (2020)	The use of EDM approaches for testing and promoting SRL was found to be effective in addressing the issues encountered when using self-report instruments for evaluating SRL in online learning settings, according to this review. As SRL indicators, EDM (Educational Data Mining) employs log or trace data obtained from educational settings. Given the difficulties, it is necessary to create a framework for integrating SRL measurement and promotion tools with EDM tools.
Baars A.W.M. et al., (2019)	This research discovered techniques for SRL to successfully assist online learners while keeping in mind that each student benefits differently from each assistance (e.g., prompts, feedback, and integrated support system). Furthermore, understanding SRL assists in online learning requires an understanding of human factors. In order to provide adaptive support systems that maximize individual learning.
Steven “Boot” Chumbley et al., (2018)	This research identified the level of self-regulation in hybrid dual enrolment courses in high school and college level agriculture subjects. Researchers found the highest level of self-regulation within the framework of environmental structures and objectives. In the field of task methods, the lowest online learning self-regulation. Females showed a greater level of self-controlled online learning, whereas racial differences were found to be small. Low connections between student experience and reported self-regulated level of learning with online courses have been discovered.
Rene´e S. Jansen et al., (2018)	This study revealed SRL's support for online education. SRL is becoming increasingly essential in open online education environments, thus accurate assessment and sufficient support are critical.
V. Pammer Schindler et al., (2018)	This study conducts a thorough literature review on 22 items designed to aid SRL in online settings. The findings of this review are as follows: (1) most studies do not assess the effect on learners' SRL strategies; (2) the use of interactive visualisations has a positive effect on learners' motivation; (3) the use of the social comparison component has a positive effect on engagement and time management; and (4) there is a lack of models to match learners' activity with the tools with SRL strategies.
Adam Noor Latiffah et al., (2017)	This study found that a learner's study method and self-efficacy in a web-based context, such as searching for information and learning on the Internet, are not significantly different from learner learning in traditional developmental classrooms.
Wandler, J., & Imbriale, W., (2017)	This review provided ways for online instructors to encourage students to adopt strategies of SRL in online courses, which have been linked to higher educational success.

Triquet Karen et al., (2017)	This review emphasizes the importance and benefits of SRL in light of the needs for online learning and teacher professional development. It defines the protocols through which numerous stakeholders may describe SRL, as well as informed and developed well-established models and consensus based on scientific facts.
You, J. W.& M. Kang (2014)	The importance of academic emotions (enjoyment, anxiety, and boredom) in the link between perceived academic control and self-regulated learning in online learning is discussed in this review. The findings suggested that pleasure mediated the relationship between perceived academic competence and self-regulated learning, though this effect was not statistically significant. Boredom and anxiety had no moderating effect on self-regulated learning, but they did have a moderating effect on the relationship between perceived academic control and self-regulated learning.
Wang Chih-Hsuan, (2013)	The results of the final model are presented in this review. Students with past web learning experiences would have more successful learning strategies and, as a result, higher levels of motivation in their online courses. Students' technical self-efficacy and course satisfaction both improved when they were more motivated in their online courses. Ultimately, students with greater levels of tech-friendly and course satisfaction obtained better score in the end.
Md Zaza Mona Saleem & Ahmad Wareth Somia Ali Abdel (2012)	In this study, students who utilized wikis as collaborative writing tools outscored those who collaborated face-to-face on essay writing. They also excelled them in terms of SRL ability. This research has implications for how wikis might be used to teach evidence from literature and writing skills.

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The researcher looked at more than 45 study papers aimed at helping students with self-regulation. Researchers focused on the key aspects of SRL techniques that were supported, the assessment methodology, and the impact on learners' self-regulation in this review. Previous study had a major flaw: there was a discrepancy between the goals of self-regulation tactics and the tests used to determine their efficacy. We recommend expanding on the preceding literature review to gain a better understanding of the relationship between the online learning environment and self-regulated learning, as well as how online learning aid affects students' self-regulated practices in their classes.

## Challenges

SRL teachers have concentrated on helping students comprehend the differences between studying online and learning in a traditional setting. This may necessitate support in problematizing thoughts like "online learning will be simpler because I can do it at home." The difficulties with this method are likely to arise when learners lack confidence in their abilities to pose inquiries or develop search keywords that provide effective results.

## Providing pacing support

You can learn at your own pace using several online learning tools and courses. This pace is important since some students' days may overlap or they may become trapped by being online for long periods of time. Some pupils may become fatigued as a result of differences in internet connection and device type. Pacing assistance has been advised by online academics as a means to assist students who are having difficulty.

Keeping track of how students interact with educational material

In online classrooms, it is vital to assess student involvement and engagement with instructional resources on a regular basis. When students quit coming to class or their grades fall, it might be a sign of mental distress, Madjar et al. (2011). Some teachers have used dashboards through a learning management system (LMS), while others have included embedded assistance in the course materials, Rice and Carter (2016). The expected challenges will be supporting learners in identifying when to use these tools and it should be necessary rather than optional.

Parental social & emotional support in promoting students SRL

Online learners must believe that they have internet support for SRL, Sha et al. (2012). Prior to the COVID-19 pandemic, online teachers relied on parents or other mentors to assist with SRL, which included monitoring student progress, encouraging students, communicating assignment and achievement information, and even providing instructional aid, Borup et al. (2010). Given the variety of perspectives, expectations, and abilities that parents or other on-site mentors may bring to online work, consistent communication patterns about how to provide SRL support appear to be critical to a smooth transition to online work, Carter et al. (2016).

## Conclusion

In summary, the goal of this research is to address a number of critical components in defining, developing, and evaluating SRL, particularly SRL online. In terms of the issues of online learning and teacher professional development, the study emphasizes the importance and benefits of SRL, then moves on to provide a shared understanding of SRL based on well-established models and scientific consensus. Parts two and three include a comprehensive assessment of the research as well as existing and emerging methodologies and technology, with the purpose of making it easier to develop (promote and evaluate) effective SRL interventions using the internet. Finally, these cutting-edge practices and their potential aim to provide fuel for informed SRL

discussion while also addressing educators' objectives.

## Recommendations

Instructors and their teaching and learning centers should work closely together. Professors can aid these professionals in building better online courses over time and through multiple revisions. Faculty who doesn't have these resources can benefit from online tutorials, publications like this one, and connecting with the increasing community of academics on social media and other platforms. Some students may argue that questions about study habits or the efforts we make in our studies are required. It is the instructor's responsibility to provide appropriate assistance and to address the learners' concerns. They should also mention the course's difficulty. Instructors should also emphasize the value of online communities in assisting students who are isolated during classes.

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