

# Self-regulation in Online Environments: A Content Analysis



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**Abstract :** The present study seeks to extend previous research regarding self-regulation in online environments, by presenting the results from a content analysis of studies published in seven peer reviewed educational technology journals from 2005 to 2012. The selected articles had to include research participants, so meta-analyses and book reviews were excluded. The purpose of the analysis was to identify similarities and differences, to identify patterns and to look for the common themes on self-regulation in online environments. The analysis of the studies revealed three main sub-themes related to self-regulation in online environments. The themes that emerged from the analysis are: (1) the effects of online environments on subscales of self-regulation, (2) the relationship between self-regulatory skills and academic achievement in online courses, and (3) the relationship between immersing in online courses and self-regulation.

**Key words:** Self-regulation, Online learning, Distance education.

## INTRODUCTION

As computer technology develops, many educators have tried to use computers and the internet to support education. Many universities and schools offer online courses to enable millions of people to have easy access to teachers, and students who are unable to attend classes, either full-time or part-time, choose distance education and online courses. Since autonomy is the main characteristic of online learning environments, self-regulation is a crucial factor for success in online learning. Indeed, the lack of self-regulatory skills causes students to misunderstand the concept of autonomy in online learning and therefore they may not perform their assigned tasks well [1]. A literature review demonstrates that there are many indicators for self-regulation, such as goal setting, goal-orientation, motivation, time management, task strategies, environment structuring, help-seeking, expectancy for learning, intrinsic goal orientation, and resource regulation [2], [3], [4]. Self-regulation refers to an active constructive process where students consider their previous experiences and the current environment, and set their goals of learning as a new standard of learning, in contrast to the common academic progress [5]. The purpose of this paper is to present an analysis of the theme of self-regulation in online environments. The purpose of the analysis is to identify similarities and differences, to identify patterns and to look for the common themes on self-regulation in online environments.

## DATA COLLECTION

This study identifies and analyzes articles about self-regulated learning in online environments. The 10 sources that have been published during 2005 through 2012 were selected from seven peer-reviewed educational technology journals, including "The Internet and Higher Education", "Journal of Association of Learning and Technology", "International Review of Research in Open and Distance Learning", "International Journal of Instructional Technology and Distance Learning", "Educational Technology and Society", "American Journal of Distance Education", and "Practical Assessment, Research and Evaluation". The analysis only included sources with the words self-regulation, online learning and online environments (or web-based learning) as part of the title. To figure as part of the analysis, the journal sources had to include research participants, so meta-analyses, book reviews and other documents that do not include research participants were excluded.

## METHODOLOGY

The methodology used in this study is content analysis, a technique used to identify and describe patterns in a collection of texts. Content analysis is "a research technique for the objective, systematic, and quantitative description of manifest content of communications"[6]. Krippendorff in [7] described content analysis as "the use of replicable and valid method for making specific inferences from text to other states or properties of its source". A good rule for content analysis is simple word counting, coding and categorizing the data based on the similarities in their meanings or connotations [8]. As part of this analysis, all articles were read and numbered and then were coded. As part of the coding process, a table was created. This table consisted of the finding sections of all articles. Then, relational analysis was employed to identify common topics, and finally the themes emerged from the analysis.

## FINDINGS

The analysis of the 10 studies revealed three main sub-themes related to self-regulation in online environments. The themes that emerged from the analysis were: (1) the effects of online environments on subscales of self-regulation, (2) the relationship between self-regulatory skills and academic achievement in online courses, and (3) the relationship between immersing in online courses and self-regulation.

### **The effects of online environments on subscales of self-regulation**

Online environments have positive effects on some subscales of self-regulatory skills, but have no effects on some other subscales [3], [9], [10], [11]. The results of [3] revealed that the goal orientation skill of students, as an indicator of self-regulatory skills, changed during online courses. Reference [9] stated that the time management subscale of self-regulatory skills did not change during online courses. It also indicated that online courses had no significant effect on the help seeking and self-evaluation subscales of self-regulatory skills. Furthermore, its results revealed that there were no significant differences in environment structuring and task strategies subscales of self-regulatory skills. Campbell in [10] stated that using online journaling environments helped students to set their goals. The results also revealed that Assistive eXtra Learning Environment (AXLE) helped students to monitor themselves and achieve their goals. He stated that the AXLE “assists students to reflect on their goal, be reminded of it and ultimately achieve their goal”. Campbell also claimed that AXLE helped “the students with personal control as well as with goal setting in the future”. Therefore, online learning would help students with goal setting in the future, and not just during the course. Reference [11] indicated that the performance control strategies subscale, including self-instruction and self-monitoring, significantly changed during online courses. The author of this article also stated that the cognitive strategies subscale, including elaboration and organization skills, significantly changed during online courses. This study also indicated that the self-efficacy strategies subscale, including peer feedback and attribution feedback, did not change over time.

### **Relationship between self-regulatory skills and academic achievement**

Another emerging theme shows that there is a direct relationship between self-regulatory skills and students' academic achievement. In five studies the students' achievement has been measured by their grade point average (GPA) [2], [3], [4], [12], [13]. Reference [2] stated that there were five different classes of self-regulatory learning strategies and skills. The authors also claimed that there was a significant direct relationship between students' self-regulatory classes and their GPAs. “Super and competent self-regulators had the highest GPAs and were not significantly different from each other in GPA”. The results also indicated that the lowest GPAs belonged to the non-self-regulators, forethought-endorsing self-regulators, and performance/reflection-endorsing self-regulators respectively. The authors of this study also claimed that the GPAs of individuals who belonged to the same classes were similar to each other. Matuga in [3] stated that students who were more self-regulated and goal-oriented had a higher GPA than others. Bell in [4] expressed that expectancy, as an indicator of self-regulatory skills, had positive impact on students' GPAs. He also claimed that the expectancy for learning was one of the best predictors of learning achievements in online courses. However, intrinsic goal-orientation and resource regulation, which were other indicators of self-regulation, did not have any effects on

students' GPAs. The author also claimed that “expectancy for learning exerts a greater effect at lower values of GPA” than higher values.

Reference [12] indicated a direct relationship between students' self-regulation and their perceptions of online course communication and collaboration. The authors also claimed a direct relationship between students' perceptions and their academic achievement. “[A]s student perceptions of online course communication and collaboration become more positive, their academic achievement as measured by GPA also improves”. Furthermore, Puziferro in [13] stated that self-regulatory skills, including ability to monitor, regulate, and manage resources, is a key factor for students' success. The results of this study also revealed that effort-regulation and time and study environment were significantly related to grade performance. This study emphasized that students who had higher scores on these subscales had higher GPAs. The author of this study defined time and study environment subscale as the scheduling, planning, budgeting study time, and regulating the general study environment. Furthermore, she stated that effort regulation “reflects the level of commitment students maintain when faced with obstacles”.

### **Relation between immersing in online courses and overall self-regulation**

The next theme that will be discussed is that immersing in online courses does not change overall self-regulatory skills [1], [3], [5], [9]. Reference [1] claimed that online environments have the crucial aspects to support self-regulated learning. However, it emphasized that “there is no evidence as of yet to support the claim” that online environments improved self-regulatory skills. Matuga in [3] indicated that students' overall self-regulatory skills did not change during online courses. She mentioned “[t]here were no significant differences in mean scores on the self-regulation subscale before and after the course”. The authors of [5] stated that taking more online courses did not guarantee an improvement of students' self-regulatory skills. Although graduates had less experience with online environments, they “reported greater use of critical thinking” and “lower levels of procrastination” than undergraduates. Reference [9] indicated that there was “no significant difference in the overall self-regulatory skills of online learners across the two time points”.

## **DISCUSSION**

This paper examined the self-regulatory skills in online environments. The analysis revealed three different themes: one of these themes is about the effects of self-regulatory skills on students' achievements, while the other two themes are about the effects of online environments on overall or partial self-regulatory skills in students.

Many of the studies highlighted the impacts of using self-regulatory skills and strategies on students' success and their academic achievement. References [2], [3], [4], [13] all emphasized that self-regulatory skills improve students' academic achievement, as measured by GPA. The results indicated that using self-regulatory strategies not only improved students' academic achievement, but there was also a direct relationship between students' achievement and

the level of using self-regulatory strategies. Although all of the studies mentioned above highlighted the same idea, there is a difference between these studies: each study considered different skills and strategies as indicators of self-regulatory skills. For instance, while [3] considered goal-orientation and motivation as indicators of self-regulatory skills, [13] examined time and study environment and effort regulation as factors of self-regulatory skills, while [4] considered the expectancy for learning, intrinsic goal orientation, and resource regulation as subscales of self-regulatory skills. In other words, the term “self-regulatory skills and strategies” did not refer to the certain skills and strategies. This discrepancy makes it difficult to show conclusions about the effects of certain self-regulatory skills on students’ achievement.

Reference [12] did not indicate any direct relationships between self-regulatory skills and students’ GPAs. However, it mentioned that “online self-regulatory learning behaviors do mediate the relationship between perceptions of online courses and academic achievement. “As online self-regulatory learning behaviors increase, the relationship between perceptions of online course communication and academic achievement also strengthens”. So their findings support this emerged theme as well.

Some of the studies mentioned above highlighted the effects of online environments on overall self-regulatory skills. The research done by Barnard et al., Matuga, and Artino and Stephens highlighted that overall self-regulatory skills did not change when taking online courses [3], [5], [9]. Furthermore, [1] claimed that there still was no evidence that overall self-regulatory skills would change during online courses.

In the meantime, many of the studies examined the effects of online environments on different subscales of self-regulation. While [10] and [11] concluded that online environments improved students’ self-instruction, self-monitoring, and self-evaluation skills, [9] stated that self-evaluation skills did not change during online courses. However, [3] and [10] indicated that students’ goal setting and goal orientation skills changed as a result of using online environments. References [11] and [9] claimed that students’ help seeking and self-efficacy skills did not change during online courses. In addition to that, [9] stated that online courses did not improve time management, task strategies and environment structuring skills in students. Finally, [11] indicated that elaboration and organization skills and cognitive strategies in students significantly changed during online courses.

The comparison among the last two themes revealed that while many studies demonstrated the effectiveness of online environments on sub factors of self-regulatory skills, none of them supported the idea that online environments automatically improve overall self-regulatory skills. To summarize, enhancing subscales of self-regulation skills does not necessarily lead to enhancing overall self-regulatory skills.

## CONCLUSIONS

The findings of six studies suggested that employing self-regulatory skills is a crucial factor for success in online

environments and can lead students to reach their goals [2], [3], [4], [10], [12], [13]. Generally, the analysis revealed that there is a significant and direct relationship between the increased usage of self-regulatory strategies and getting higher marks. The analysis also revealed that online courses did not improve overall self-regulatory skills [1], [3], [5], [9]. Three studies stated that some of the self-regulatory subscales changed during online courses [3], [10], [11], while Barnard in [9] and Yang in [11] indicated that some of the self-regulatory subscales did not change during online courses. However, since the authors did not examine the effects of online environments on the same subscales of self-regulatory skills, it is difficult to make a general conclusion. The only possible generalization is that online environments can change some self-regulatory skills, but do not have any effects on other skills.

A number of implications for self-regulatory skills in online environments emerged from the analysis. As self-regulatory skills are not automatically developed, it is necessary that instructors provide more support, such as online calendars and troubleshooting web pages, for students in order to develop their self-regulatory skills [9]. They also should provide students with explicit instructional support, and scaffold online discussions [5].

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