STUDENTS' PERCEPTIONS OF AN ONLINE METACOGNITIVE JOURNAL ASSIGNMENT

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ABSTRACT

Background: *The growth of online higher education programs and the increasing numbers of students seeking remote learning experiences require educators to find new ways of meeting the changing learning needs of their students. One possible approach for facilitating success for online college students is fostering engagement in self-regulated learning (SRL). Objective: This paper discusses student perceptions of an online metacognitive journal assignment designed to promote SRL. Method: Following a brief review of the related literature, we present a study of the perceptions of 206 online students of a series of metacognitive prompts collected through a weekly online journaling assignment. We examined, coded, and reported on the data using descriptive statistics. We also conducted a thematic qualitative analysis of narrative responses to experiential questions. Results: The analysis revealed that the majority of students believed that engaging in the metacognitive exercise was valuable and contributed to success in their online courses. The students also reported that the assignment helped them feel more connected to their professors and contributed to their ability to apply course content to real-life situations. Findings: The students did perceive value in the assignment and provided positive narrative comments. Although the students perceived the assignment to be helpful, no causal relationships between engagement with the assignment and student achievement were demonstrated. Conclusion: Based on the results of this study, online instructors may find that using a metacognitive reflection journal is one way to support their students in online courses.*

Keywords: *online, metacognition, self-regulated learning, journal*

INTRODUCTION

Since the beginning of the COVID-19 pandemic, many institutes of higher education have shifted to using online or hybrid models for educating students. Before that, the growth of online programs in higher education was on the rise. While overall student enrollment in higher education had declined somewhat, enrollment in online courses had increased (Seaman et al., 2018). The response to the COVID-19 pandemic has greatly increased the need for higher education faculty to develop effective online teaching strategies. According to Fox et al. (2020) the need to transition to online course delivery triggered a "massive" change in the nature of traditional courses, with 92% of faculty members making at least one course modification during the Fall semester of 2020 (p. 16). The delivery of online instruction has permitted institutions of higher education to continue to provide educational opportunities for students during the era of COVID, and more generally, provide other benefits, such as access to

educational opportunities for select populations, including working students, older adults, and those living in remote areas. However, ensuring effective learning and student engagement in this relatively new context has presented challenges for teachers and learners.

Some believe that the response to the pandemic and the need to support students' online learning has caused "what are likely to be permanent shifts in faculty attitudes, pedagogy, and tool adoption" (Fox et al., 2020, p. 13). Online courses can require a new approach to education for the student, faculty, and higher education institutions. Online students may be required to demonstrate a more active approach to learning than in the traditional classroom. Hung et al. (2010) describe some of the tasks online learners must undertake in the online classroom to ensure success, including time management, guiding and planning for their own learning, contributing actively to the course, and making decisions about pacing and depth of content.

Because the online environment demands that students take a more active approach to managing their learning, the construct of self-regulated learning (SRL) has been studied extensively in relation to online higher education (Bursali & Öz, 2018; Fan et al., 2021; Hong et al., 2020). Self-regulation can be defined as "self-generated thoughts, feelings, and behaviors that are oriented to attaining goals" (Zimmerman, 2002, p. 65). A solid body of research shows that the skills associated with SRL are related to educational achievement (Moshman, 2018), and research on the technology-based classroom has clearly signaled that SRL is important for learner satisfaction (Choi, 2016; Hodges, 2009) and positive learner outcomes (Azevedo & Cromley, 2004; Nückles et al., 2020; Nurajizah et al., 2018; Rosnaeni et al, 2020; Sachar, 2020; Sheikh, et al., 2019; Sitzman & Ely, 2010; Steiner, 2016; Yuruk et al., 2019).

Closely related to SRL is the construct of metacognition. The term metacognition, which refers to one's own knowledge of their cognition, was developed by John Flavell of Stanford University and has been studied extensively for the last 40 years. Metacognition includes "planning, monitoring, and evaluating one's own learning processes." which comprise the critical skills for academic success (Tanner, 2012, p.144). Multiple studies published since the beginning of the pandemic have supported the notion that the use of metacognitive strategies, such as online diaries and exam wrappers, can be effective in supporting student success in online higher education courses (Anthonysamy, 2021; Bort-Mir, 2020; Rosnaeni et al., 2020; Sethares & Asselin, 2022). The purpose of this paper is to analyze and discuss the self-reported perceptions of a sample of online students assigned a metacognitive journaling assignment constructed to promote SRL.

RELATED LITERATURE

This section will address relevant theory and research underpinning the metacognitive journal exercise examined in this paper. Self-regulated learning (SRL) will be defined and the relationship between SRL and metacognition will be demonstrated. Andragogy will be briefly addressed as it relates to the needs of the adult learner in the context of the online learning environment. A discussion focusing on current research supporting the importance of SRL within online education is provided. Specific attention will be paid to the work of Tanner (2012), which was foundational to the development of the metacognitive journal assignment described here.

Self-Regulated Learning

The work of Zimmerman (1989, 1998, 2002) is crucial to the conceptual understanding of SRL. Synthesizing early research by Bandura and others on self-reinforcement, standard-setting, delay of gratification, goal setting, and self-efficacy, along with self-instruction and evaluation, Zimmerman (1989) defined self-regulated learners as those who "personally initiate and direct their own efforts to acquire knowledge and skill rather than relying on teachers, parents, or other agents of instruction" (p. 329). Zimmerman (1989) specifies that, to become self-regulated, the learner must use specific strategies to accomplish an academic goal. He identifies a range of self-regulated learning strategies: self-evaluating, organizing and transforming, goal setting and planning, seeking information, keeping records and monitoring, environmental structuring, self-consequating, rehearsing and memorization, seeking social assistance, and reviewing records. His early research also established a connection between the use of these strategies and students' academic achievement (Zimmerman & Martinez-Pons, 1988). Zimmerman (1998) also emphasized

that self-regulation is not a fixed characteristic within the learner but rather that the learner selects from a range of strategies depending on the learning context. His later research showed that the use of self-regulation strategies is teachable, and that instruction and prompting can lead to increases in achievement (Schunk & Zimmerman, 1998; Sitzmann & Ely, 2010). Additionally, he found that few teachers promote the use of these strategies (Zimmerman et al., 1996).

Conceptualizing the Relationship Between Self-Regulation and Metacognition

The notion of metacognition emerged from the work of John Flavell. Flavell (1979) defined metacognition as "knowledge and cognition about cognitive phenomena," explaining that "cognitive strategies are invoked to *make* cognitive progress, metacognitive strategies to *monitor* it" (p. 909). Metacognition and self-regulation are clearly linked in the literature, but a definition of the relationship lacks precision and consensus (Ibabe & Jauragizar, 2010). In some cases, the terms are used synonymously; in other cases, self-regulation is considered part of metacognition, while others view self-regulation and metacognition as aspects of SRL (Ibabe & Jauragizar, 2010). Exploring these complexities is not within the scope of this paper. For the purposes of the project discussed, however, we adopted a working conceptual framework in which students engaged in metacognition through completing the online journal assignment, which ostensibly functioned to promote SRL.

Adult Learning Theory and Self-Direction

Malcolm Knowles (1972) is known as the pioneer of adult learning theory, also called andragogy, which Knowles described as "the art and science of helping adults learn" (p. 32). The resulting principles of a self-directed, experiential, problem-centered approach to learning have been hugely influential and are still the basis of effective learning practices in higher education. Understanding these principles is considered by some to be the cornerstone of enabling adult learners to achieve. In his explanation of adult learning needs, Knowles (1977) emphasized self-directedness as one of the critical components of andragogy, asserting that the effective teacher of adults makes it a primary goal to "help a learner become increasingly self-directive in his or her learning" (p. 207). He also cites the "deep obligation" the teacher of adults carries for providing "orientational" experiences that require students to manage their own learning (1977, p. 207).

Research by Justice and Dornan (2001) supported this need through a study of both traditional college students and older adult students in college. Using surveys from both groups to gather information about metacognitive variables, the authors found that adult students use different metacognitive strategies than traditional-age students to navigate their college courses. They concluded that the use of metacognitive strategies has a developmental component, and that more attention should be paid to understanding the unique needs of each group in the college classroom. Although this research does not address these issues within the online learning context, it supports the idea that the relative value of various strategies for the promotion of SRL must be viewed contextually. Artino and Stephens (2009) reinforced these conclusions for online learning in a study examining differences between undergraduate and graduate students' use of self-regulatory strategies, concluding that the two groups differ significantly from each other in their ability to employ these strategies for success in online courses. More recently, Yarbrough (2018) has proposed a model for adapting adult learning theory for the online learning environment that integrates behaviorism, social development theory, Mezirow's (2000) critical reflection ideas, and Dirkx's "Nurturing Soul in Adult Learning" (2002). Yarbrough posits that this approach, which emphasizes active learning and reflection, should serve as a foundation for an enriched online learning environment.

Self-Regulated Learning in the Online Classroom

Although the value of self-regulatory and metacognitive strategies in learning has been acknowledged for decades, recent research has provided specific evidence that the use of these strategies can benefit college students (Bursali & Öz, 2018; Fan et al., 2021; Kitsantas et al., 2008; O'Loughlin & Griffith, 2020; Steiner, 2016; Tuckman & Kennedy, 2011). However, due to the rapid rise of technology, the role of these constructs in the online teaching and learning environment has only recently begun to be explored. Initial research indicates that engaging in activities related to SRL is associated with a variety of positive outcomes

for the online learner. In an early review of literature on self-regulation in web-based environments, Hodges (2009) concluded that there appears to be a positive relationship between self-regulation and success in web-based learning, stressing that "research should be conducted to determine those features of Web-based courses that promote self-regulation" (p. 381). In a meta-analysis and review of online learning studies by the United States Department of Education in 2009, the researchers concluded that the practice of promoting reflection on learning by online students is clearly supported by the available evidence: "the available research suggests that promoting self-reflection, self-regulation, and self-monitoring leads to more positive online learning outcomes" (Means et al., 2009, p. 45). Since 2009, additional research has supported the positive relationships between self-regulation and academic performance (Guo, 2022; Lawanto et al., 2014; Lehmann et al., 2014) and self-regulation and learner satisfaction (Cho & Shen, 2013; Choi, 2016) for online learners.

Tanner and Student Metacognition

Kimberly Tanner (2012) applied some of these concepts in a structured way to the teaching of undergraduate biology students. Inspired by earlier research on metacognition and self-regulation, Tanner created a series of questions to promote metacognition that revolved around planning, monitoring, and evaluating learning in the college classroom. She describes her experience assigning her students these questions as a weekly assignment in undergraduate biology courses. Questions used for this metacognitive journaling assignment were selected and adapted from the list contained in Tanner's article. However, while Tanner's original questions were instrumental to the development of the metacognitive assignment we gave to students, our research project expanded on Tanner's initial use of the questions by using the prompts with both graduate and undergraduate students and with students in content areas unrelated to biology.

THEORETICAL FRAMEWORK

We were piqued by the aforementioned literature, and teaching in the online environment with adults caused us to examine ways to reconnect the students with the learning environment. Andragogical theory developed by Malcolm Knowles (1972, 1977) supports the need for adults to be self-directed. It emphasizes the value of self-directed learning, where adults actively participate in their personal learning journey. Knowles defines "self-directed learning" as taking the initiative to assess one's own needs, create goals, and seek out appropriate strategies on their own. (Kurt, 2020)

Within this context, we selected metacognition to engage the online learner in active participation in the scheduling of their work. Supported by the work of Tanner (2012), we selected weekly journaling as an engagement strategy. Using her work with biology students as a model, we incorporated selected components into a plan for weekly self-reflection to promote focusing students' attention on their time allocation for completing the online coursework. One assumption in the development and implementation of the metacognitive journaling project described here was that the metacognitive nature of the exercise, in which the mostly adult online students were asked to plan, monitor, and evaluate their individual process of learning, would serve to support and promote andragogical principles of self-direction.

RESEARCH DESIGN

Using the work of biology professor Tanner (2012) as a foundation for developing a metacognitive reflective exercise, a sample of undergraduate and graduate students enrolled in multiple sections of three different eight-week online courses was assigned a series of weekly metacognitive journal assignments. We developed and implemented the journal assignment to address the online students' unique needs. We created the assignment with the theory that online metacognitive journaling would be consistent with Knowles's andragogical principles for adult learning and would also promote SRL. The implementation of the project evolved over time, with additional prompts added following the initial implementation of the metacognitive prompts as a means of assessing the effectiveness of the assignment.

METHODOLOGY

The journaling assignment involved providing online students with a structured opportunity to respond to a series of metacognitive prompts to promote self-regulated learning (SRL). This assignment was called Big Ideas. Students were required to submit answers to the Big Ideas questions weekly throughout their eight-week online courses.

Questions included in the original Big Ideas assignment are listed in Table 1, grouped by the week within the course they were presented to students.

Big Ideas was a graded weekly student assignment in each course. The assignment was given the token amount of course credit of 10 points per week, resulting in a total value of 80 out of the 1,000 points allocated for each course. Students were asked to respond in one or two paragraphs to each prompt. Assignments were submitted electronically through the Blackboard Learning Management System (LMS) to the professor. All assignments were assessed within 72 hours of the due date, and each student received written feedback from their professor on weekly submissions.

Table 1.
Initial Big Ideas Assignment Questions

Week One: Planning Prompts
What do I already know about (course title) that can help me in this course?
Is the study of (course topic) important to me? Why/why not?
How much time will I allocate to this course every week, and how will I spend that time?
What do I most want to learn in this course?
What kind of feedback from the instructor do I want and/or expect?
Weeks Two Through Seven: Monitoring Prompts
What was most confusing to me in this week's lecture, video, or reading?
What insights have I gained as a result of this week's activities?
How have I utilized the instructor's feedback to improve my understanding and performance in the course?
Week Eight: Evaluating Prompts
What will I still remember five years from now that I learned in this course?
What advice would I give a friend about how to learn the most in this course?

Initially, a series of brief metacognitive questions were assigned to students weekly throughout an eight-week course session, which students submitted weekly for a small number of points. The purpose of the questions was to prompt students to take an active approach to their own learning by planning, monitoring, and evaluating their weekly online learning experiences. As the response to the assignment from students seemed to be favorable, after several months, we added a set of phenomenological questions in the final installment of the assignment to gather more specific information about the student's perceptions of the metacognitive journaling exercise.

After a pilot use of the initial prompts, we determined that additional questions would be helpful in gathering data regarding student perceptions of the assignment. As a result, three more questions were added to the initial prompts during the final week of the assignment to gather detailed self-reported information about students' perceptions of the journaling assignment (see Table 2). The additional experiential questions added the topics of time allocation, outcome attainment, and future recommendations for the inclusion of Big Ideas in other courses. These content additions were guided by our review of Tanner's work (2012) and our reflection on the nature of student responses from the pilot implementation of the assignment.

Table 2.
Additional Experiential Questions

Question One (Time Allocation): Did your time allocation plan from week one help you meet your goals in this course?
Question Two (Future Recommendation): Would you recommend the Big Ideas assignment be included in the other courses you will take?
Question Three (Outcome Attainment): How did the Big Ideas assignment affect your outcomes in this course?

Sample

This investigation took place in the online division of a private, faith-based university. Approximately 2,200 students were enrolled in the division, which utilized an accelerated, year-round format of sequential eight-week terms to deliver instruction in both undergraduate and graduate programs. Most students reside within Southern California, although enrollment does include students residing throughout the United States and a few international students. Students were mostly adult learners, with the average student age in the undergraduate programs of 31.2 years, with 59% female and 41% male enrollment, and the average student age in the graduate programs was 34.5 years, with 71% female and 29% male enrollment.

The sample was comprised of 254 students

enrolled in undergraduate and graduate courses in two educational programs: a Bachelor of Arts in Early Childhood Studies (BAECH) and a Master of Arts in Organizational Leadership (MAOL). Participants were drawn from one section of two different courses in the BAECH program and eleven sections of one course in the MAOL program. A small group of full-time and adjunct professors taught the courses from which the data was gathered. One of the BAECH courses was a leadership course, and the other course focused on the topic of diversity. The MAOL course was an introductory course for organizational leadership. The sample was a convenience sample, relying on students enrolled in courses that we were able to standardize. We embedded the Big Ideas assignment into selected courses within their respective academic degree programs by building the course templates of the Learning Management System and gathering data each time a new section was taught.

Data Collection and Analysis

For this report, data from the three experiential questions in the Big Ideas assignment were collected from the LMS after the end of the courses. To analyze Question One (Did your time allocation plan from week one help you meet your goals in this course?), each student's response was reviewed to determine whether the student comment indicated a positive (allocation plan helped) or negative (allocation plan did not help) response to the prompt. A similar process was followed for Question Two (Would you recommend the Big Ideas assignment be included in the other courses you will take?), with the positive responses indicating the student would recommend the assignment versus a negative response indicating the student would not recommend the assignment for future students. The nominal data (positive versus negative) for questions one and two were collected and totaled and are presented using descriptive statistics in Tables 4 and 5. For these questions, additional student comments were also collected to shed more light on student perspectives. For the narrative data provided by students in response to Question Three (How did the Big Ideas assignment affect your outcomes in the course?), we conducted a thematic analysis using a multistep process. This process began with entering all the comments provided by students into Microsoft Excel and creating a master list of statements in Microsoft Word. Thematic analysis was then performed by reading the students' comments and highlighting keywords to identify the meaning of the comment. Additionally, a Microsoft Word macro was used to count word frequencies and validate the repetition of keywords and phrases. Each of us completed the thematic analysis process independently and then we met to discuss the results and resolve any discrepancies together until a consensus was reached.

RESULTS/DATA PRESENTATION

Table 3 shows the total number of students participating in the study in the different courses. While there were 254 potential participants, because of attrition or failure to complete course assignments, only 206 students provided data from questions in the final week of the Big Ideas assignment (BAECH = 33, MAOL = 182). The resulting data are presented only for those students who completed the courses and all or part of the questions from the final week of the Big Ideas assignment in each section.

Table 3.

Total Number of Students in Courses Surveyed

Course	Level	Total N
BAECH (Leadership)	UG	17
BAECH (Diversity)	UG	26
MAOL (Intro to ORG)	GRAD	211
TOTAL		254

The data gathered from responses to each Big Ideas question are presented below. Descriptive data from Questions One and Two are shown in Tables 4 and 5, with additional narrative comments provided for clarification and additional understanding. Emergent themes from Question Three are presented and supported with select student comments.

Question One (Time Allocation)

Data presented in Table 4 illustrate that, of the 206 students who answered this prompt, 162 students (81%) indicated that the completion of the time allocation planning prompt from the Big Ideas assignment helped them meet their goals. The remaining students (19%) indicated the Big Ideas time allocation planning prompt did not help them meet their goals in the course.

Table 4.
Students' Answers to Question One

Did your time allocation plan from week one help you meet your goals in this course?					
Students	Level	Respondents	Helped	Did Not Help	Percent Yes
TOTAL	UG & Grad	206	162	14	81%

The corresponding written evaluation comments for this question ranged from positively describing how the time allocation plan they developed was helpful to stating the plan they developed was helpful but that they were unable to follow their plan. Several students commented that they would have underestimated the amount of time necessary to devote to the courses without the planning prompts and feedback from the instructor. Many stated that being required to think about planning helped them review the syllabus, as they could identify weeks when large assignments were due. Based on the students' comments, it seemed the planning exercise enabled them to be more prepared for the time needed to complete the more significant assignments due throughout the course.

Additionally, many students mentioned their tendency to procrastinate and how facing a weekly self-reflection helped to prevent this behavior. Sample student comments included:

My time allocation plan was a great tool in my success in this course. Knowing early on that this course was going to be one that I wanted to do a lot of thinking and research on, being able to allocate the time to look up information was a big help. Being able to set aside time to read the text and tie information in with questions and responses was another great tool. Keeping up on assignments and not waiting until the last minute helped to keep my overall critical assignment together, and I was able to easily put it together. Overall staying on top of my time allocation plan was very helpful in this course.

Another shared:

As this is my first time being an online student, I believe I'm getting the hang of it. With my busy schedule during the week, I am learning how to manage my time better. It is tough, but you get out of life from what you put into it. As the insight of what I have gained this week from the activities, I am beginning to view and do work in a professional manner.

This student pointed out the benefit of getting ahead of the work due:

I allocated my time for this class well, and I was able to get ahead with my assignments and stay ahead the entire semester. It is hard once you fall behind in a class to catch up and to turn in excellent work.

Another appreciated the importance of establishing a goal:

Yes, I do believe that my time allocation plan helped me to meet my goals in this course. I had planned to make a lot of time to complete assignments and read the text because I knew how important time management was going to be to my success and having that goal in mind was a constant reminder.

Finally, one student commented about how the time planning helped deepen their understanding of the material:

Yes, it did! I was able to stick to my schedule (most of the time) and plan out how I would tackle this course, as well as the other one that I was enrolled in. I planned ahead on how I would tackle and complete everything, which allowed me the time to think about and understand the material.

Most students who indicated that making a time allocation plan did not help them stated the reason it did not help was due to their own failure to follow their own plan. For example, one stated:

Unfortunately, the time allocation plan from week one did not assist me throughout this course or to meet my goals because I failed to allocate and prioritize

my time. The idea was definitely there at week 1, but I failed to execute mainly because I wasn't expecting to have a minimum of four assignments due weekly.

Another student stated:

I believe my plan was helpful for the first six weeks and worked as planned. However, in the last two remaining weeks, my plan fell apart because I began to procrastinate due to work commitments and stresses.

Question Two (Future Recommendation)

Table 5 shows that of the 206 respondents, 167 students (81%) recommended that the Big Ideas assignment be included in future courses, while 39 students (19%) did not recommend it be added.

The majority of students stated that they would recommend this assignment be included in their future courses. Numerous reasons were offered, with many reinforcing their support for the time allocation exercise and the various other positive effects on their course outcomes. However, students identified additional benefits of the Big Ideas assignment, some of which included providing a way for the instructor to monitor the effectiveness of instructional activities, allowing an accessible forum for students to touch base and communicate with instructors, and providing a more relational environment than they expected in an online course. Some of these comments included:

Absolutely! Having the freedom to express what we thought about the assignments and being able to get feedback in order to improve in the coming weeks was huge. I have coworkers taking a master's program at a different school, and they struggle because they don't get feedback from one assignment until after they have to turn in another assignment, so they don't know

if they did anything wrong and can't fix it before more assignments are due. I valued this assignment because, without open communication, it makes learning harder.

Another student confirmed the value of weekly summarizing their learning:

Yes, I believe the "Big Ideas" assignments were extremely helpful in this course. They served a dual purpose for me—allowed me to reflect on my learning and allowed a personalized interaction with the instructor. Each week I was able to reflect on a takeaway as well as what was the most confusing concept.

One student commented on the value of the assignment for the missed concepts from the week, and how this opportunity gave them easy access for content clarification:

I would recommend the Big Ideas assignment. I liked it, especially because this is strictly an online class, with no face-to-face time unless you come in for office hours. It allowed us to voice if we had any concerns with the material for the week and what the biggest takeaways were; reflection on what we have learned for the week is always good, even just for ourselves.

For the small percentage of students who answered that they would not recommend the Big Ideas assignment in the future, most indicated they felt the assignment was unnecessary. For example, a few stated they did not feel the need for the level of support provided by Big Ideas, as they would have personally contacted the professor if they needed assistance. One student stated:

No, I would not recommend the "Big Ideas" assignment be included in other courses mainly because the assignment

Table 5.

Students' Answers to Question Two

Would you recommend the Big Ideas assignment be included in the other courses you will take?					
Course	Level	Respondents	Recommend	Did Not Recommend	Percentage Yes
TOTAL	UG & Grad	206	167	39	81%

is time-consuming. Most online students work full time, have children, and maintain their households. I think it would have been a great idea in my undergraduate program to allow an opportunity for students who may lack confidence or struggle with communicating with their instructor. Speaking for myself as a Graduate Student, the "Big Ideas" is unnecessary busy work, and the Discussion Boards are enough.

Question Three (Outcome Attainment)

Three consistent themes emerged using thematic analysis of the narrative comments provided by students in response to the prompt about how the metacognitive journaling assignments influenced their outcomes in the course. Most students commented on the value of the reflection on the work completed during the week as adding to their overall learning and achievement of course outcomes. Another theme that emerged was the connection to the faculty, and the support for academic efforts students felt from the professors. A third theme identified was the way learning from the course was extended, encouraging the application of course content.

First, many students commented on how the value of the weekly reflection on their coursework added to their overall learning and achievement of course outcomes. The majority of students stated that the Big Ideas assignment positively influenced their course outcomes. Some indicated that their perception of the value of the assignment evolved as they went further into the course. One student stated:

My opinion on the Big Ideas assignment changed around week three of the course. At first, I thought this was just an extra assignment that took time out of my week. Honestly, I was not being fair to myself or this course. The Big Ideas is a great format to communicate any problems with the assignments and to reflect on the week as a whole.

Another shared:

The "Big Ideas" project helped me to reflect every week on the assignments and materials. I think that they helped me to

remember what I learned in the discussion boards, activities and readings. Most of all, it helped me to think about the future and how I could use the content when I began teaching. It only took a few minutes to complete and was worth the time for reflection.

Second, students expressed appreciation for the connection to the faculty and support for academic efforts students felt from the professors. Initially, many students expressed anxiety about the online course environment and the absence of face-to-face communication with the professor. Students appreciated the structured opportunity to regularly connect with the professors, which helped to lower their anxiety about the online learning experience. Summarizing these experiences, one student stated:

The Big Ideas assignments were of great value to me. Especially with this being my first online college course, I was a bit apprehensive about completing my master's degree online. I knew the ins and outs of obtaining my bachelor's degree in the traditional in-person way, but I was unfamiliar with how completing a degree program online would be. I really appreciated all of your honest feedback and weekly videos. I don't think that I would have such a positive view of the online program had it not been for your course being the first course that I had to take. All of the feedback that you gave to me I will move forward and use in my courses and have set me on a path to be successful in this program.

Commenting on the value of regular connection with faculty, another student shared:

The Big Ideas assignments allowed the opportunity to reflect on everything that was learned that week. It didn't particularly matter if there wasn't anything confusing; it was a way to write down some ideas and have the instructor give feedback. I enjoyed how the feedback turned into a conversation that motivated me to put more of myself into the Big Ideas post and to really reflect on what was taught that week because I knew that the

instructor read and would give insights.

Yet another student shared:

Big Ideas assignments helped me stay connected with our professor. It was a space where I could express areas of concern and some of my personal challenges. Through this assignment, I received the support I needed to keep moving forward. Thank you for not giving up on me!

Finally, several students discussed how the learning from the course was extended and made into applications as a result of the Big Ideas assignment. In discussing how this experience affected them personally, one student stated:

The "Big Ideas" assignments reinforced a required weekly dialogue between the professor and student. They allowed me to share any areas of confusion requiring additional professor input so that I could fully grasp all concepts. They prompted me to dig a bit deeper to identify what insights I had gained in the reading or assignments of the week. In doing so, it took the tasks of the reading and assignments to a place of personal impact. Lastly, I found it meaningful to be able to report back to the professor how his feedback was helpful or what I had gained as a result.

Yet another student said:

I was able to express some real thoughts about how I was retaining the material and applying the methods in my own career. I was also able to express frustrations with some concepts I did not clearly understand or relate to.

A third student stated:

As you are well aware, you forced me to think and see things differently and exposed me to things I would have never been exposed to otherwise. It was a place to learn, be candid and critically think about things.

To summarize, in general, these students had positive responses to the Big Ideas assignment, and the vast majority of students felt that the prompts contained in the assignment benefited their learning outcomes in multiple areas. Overall, they expressed a value from being assigned the metacognitive exercises to their own performance in the online learning environment, sometimes in profound and meaningful ways.

FINDINGS AND LIMITATIONS

The student's responses to Big Ideas were mainly positive and supported the design and use of the metacognitive exercise in these online courses. The narrative comments emphasized the value of reflection, connection to faculty, and applying course content. The major findings are summarized below.

Findings

In general, students had positive responses to the Big Ideas assignment, and the majority of students felt that the prompts contained in the assignment were beneficial to their learning outcomes. They felt they received value from the assignment despite the extra work and believed it contributed positively to their performance in their online class. Based on the data we gathered in response to Question One, providing a time allocation planning prompt for students in online courses may be beneficial as a means of helping them structure their time for academic success. Several students commented that the time allocation exercise would have been helpful had they stuck to the plan they had created. A midcourse recheck of the plan might support students' adherence and yield better results.

The majority of students recommended Big Ideas for future courses in response to Question Two and made a variety of comments suggesting why they answered this way. Based on these comments, they especially appreciated the opportunity to provide feedback and the chance to communicate with their professors in this way. The idea that the majority of students recommended the assignment for further courses, even with the awareness that the assignment translates into extra work on a regular basis, seems to indicate that they perceived it to have a high degree of value.

It is also noteworthy that the data collected from Question Three suggest that students' outcomes were affected in a myriad of positive ways, even beyond the expected benefits of the metacognitive activities of planning, monitoring, and evaluating their progress in the courses. For example, student comments indicated that they were connecting the

information they learned to their prior knowledge in more significant and meaningful ways. Also, some commented that they were challenged by the Big Ideas assignment to apply the information they learned to their current work environments. In addition, students said that being asked to reflect on their learning on a weekly basis deepened their understanding of the material they learned and helped them see how they had grown from their experiences in the course. Finally, many students felt the Big Ideas assignment functioned as a vehicle for greater connection to their professors, which enhanced their online learning experience.

Limitations

While 81% of students participating in this study recommended this assignment for future courses, suggesting both further use and study of the benefits of metacognitive exercises like Big Ideas for online students, when considering for future application or research, it may also be important to explore why the few who did not recommend it responded as they did. Perhaps in future studies, fewer metacognitive prompts could be provided while still including the elements the students found helpful.

Indeed, multiple limitations narrow the applicability of this study. The older adult students who participated in the Big Ideas project were all enrolled in one university and were selected as a convenience sample. Participants were limited to two academic programs in one department from one division and were enrolled in a limited number of courses. Other important limitations include the nature of self-assessment and reliance on self-reported data, which may or may not reflect the true nature of students' experiences or positive learning outcomes. In addition, although students perceived the assignment to be helpful, no causal relationships between engagement with the assignment and student achievement were established due to this qualitative study. The study was not designed to investigate the academic performance of the students beyond their self-perception of its impact; ideally, future research could establish whether any actual positive impact on achievement is present for students who complete Big Ideas.

Moreover, Big Ideas was a graded assignment, which might have encouraged students to respond to the prompts more positively than they might have otherwise if they were concerned that their grade would be affected by negative feedback. Further, the nature of thematic coding limits the interpretation of the results, as "there is no clear agreement about what thematic analysis is and how you go about doing it (Braun & Clarke, 2006, p. 79). Finally, the teaching behaviors and perspectives of the small number of faculty who taught these courses was not considered, which could certainly have influenced students' response to Big Ideas within the context of these courses. Despite all of these identified limitations, based on the high level of positive feedback and recommendations from students for further use of this assignment, and the unanticipated benefits of engagement with the questions reported by students, the results lay the groundwork for further investigation into metacognitive tasks in the online classroom.

RECOMMENDATIONS AND CONCLUSIONS

Research supports the importance of self-regulated learning (SRL) and using metacognitive strategies for student achievement. This study, which examined students' perceptions of using a metacognitive assignment designed to promote planning, monitoring, and evaluating learning for students in online courses, yielded results that provide additional support for the body of research on the value of SRL and the promotion of metacognition.

Implications for Future Research

This investigation, which builds upon the prior work of Tanner (2012) and others, leaves many questions unanswered; hopefully, future endeavors will provide additional clarity on how engagement in metacognitive exercises like the Big Ideas assignment can promote success for online college students. Prior work, like that of Justice and Dornan (2001) and Artino and Stephens (2009), suggest that the utility of metacognitive prompting may vary for different populations, such as undergraduates and graduate students or adult students and traditional-age college students. In this investigation, the differences between the responses of the undergraduate students and the graduate students were not assessed, nor were the differences between traditional age and adult students separated, and the numerical results from students were grouped into averages.

Further research could, for example, explore how metacognitive assignments function differently

within and between various groups of online students, including adults, undergraduate students, and graduate populations, along with students studying multiple content areas. Future studies should include more diverse populations and be conducted in various online courses to understand more about the benefits of metacognitive exercises. Finally, future research could also consider the other pedagogical approaches and/or perceptions of the faculty using Big Ideas as a method of triangulation and analysis, which could provide some additional contextual and anecdotal insights into the use of metacognitive activities. Hopefully, future research can identify more details about how metacognitive assignments can benefit the growing and diverse population of online students.

Implications for Practice

In the rapidly changing landscape of higher education, managing the evolving challenges of COVID-19 and its impact on instructional program delivery modality, combined with the continuing shift towards using online or hybrid models for educating students, faculty must incorporate ways to provide more effective instructional delivery strategies to support student achievement of course learning outcomes (Fox et al., 2020; Keengwe & Kidd, 2010; Sethares & Asselin, 2022). Based on the results of this study, faculty teaching online may consider using a metacognitive reflection journal as one way to support their students' success. Based on the results of this study, we recommend that online instructors consider including a metacognitive reflection activity similar to Big Ideas as one way to increase adult learners' engagement with the online content. This study of online students validated several other studies that demonstrated positive correlations when metacognitive activities are included in online courses. The exact nature of metacognitive exercises could take many forms.

Research by Justice and Dornan (2001) indicated that metacognition has a developmental component, which was reinforced by the work of Artino and Stephens (2009) who documented differences between undergraduate and graduate students in how they approached metacognition. The Big Ideas assignment is one means to promote metacognition and self-regulated learning, but, of course, other approaches could be used, and context could be a key element. These processes could look different depending on program level (undergraduate or graduate), student profiles, or academic disciple.

Students who participated in this study emphasized that the opportunity for planning was a key element, as was allowing students to provide feedback on assignments. Establishing a relational environment between professor and student was a benefit, as was the opportunity for reflection and application of course concepts. Whatever form these exercises take, we hope that faculty and instructional designers will consider the implementation of these and similar strategies to improve instructional outcomes for all online students.

Ethical approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of California Baptist University and with the 1964 Helsinki declaration and its later amendments. This research was determined to be exempt by the Institutional Review Board. For this type of study, formal consent is not required.

References

Anthonysamy, L. (2021). The use of metacognitive strategies for undisrupted learning: Preparing university students in the age of pandemic. *Education and Information Technologies, 26*, 6881–6899. https://doi.org/10.1007/s10639-021-10518-y

Artino, A. R., Jr., & Stephens, J. M. (2009). Academic motivation and self-regulation: A comparative analysis of undergraduate and graduate students learning online. *Internet and Higher Education, 12*(3-4), 146–151. https://doi.org/10.1016/j.iheduc.2009.02.001

Azevedo, R., & Cromley, J. G. (2004). Does training on self-regulated learning facilitate students' learning with hypermedia? *Journal of Educational Psychology, 96(3)*, 523–535. https://doi.org/10.1037/0022-0663.96.3.523

Bort-Mir, L. (2020). Using PenzuTM for academic online diaries to enhance metacognitive skills in higher education. *The EuroCALL Review, 28*(2), 50–63. https://doi.org/10.4995/eurocall.2020.12756

Braun, V., & Clarke, V. (2006) Using thematic analysis in psychology. Qualitative Research in Psychology, 3(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Bursali, N., & Öz, H. (2018). The role of goal setting in metacognitive awareness as a self-regulatory behavior in foreign language learning. *International Online Journal of Education and Teaching,* 5(3), 662–671. https://doi.org/2148-225X

Cho, M., & Shen, D. (2013). Self-regulation in online learning. Distance Education, 34(3), 290–301. https://doi.org/10.1080/01587919.2013.835770

Choi, B. (2016). How people learn in an asynchronous online learning environment: The relationships between graduate students' learning strategies and learning satisfaction. *Canadian Journal of Learning and Technology, 42*(1). https://doi.org/10.21432/T24K7R

Dirkx, J. M. (2002). Nurturing soul in adult learning. *New Directions for Adult and Continuing Education, 74*(Summer), 79–88. https://doi.org/10.1002/ace.7409

Fan, Y., Matcha, W., Uzir, N. A., Wang, Q., & Gašević, D. (2021). Learning analytics to reveal links between learning design and self-regulated learning. *International Journal of Artificial Intelligence in Education, 31*(4), 980–1021. https://doi.org/10.1007/s40593-021-00249-z

Flavell, J. (1979). Metacognition and cognitive monitoring. A new area of cognitive-developmental inquiry. *American Psychologist, 34*(10), 906–911. https://doi.org/10.1037/0003-066X.34.10.906

Fox, K., Bryant, G., Srinivasan, N., Lin, N., & Nguyen, A. (2020, October 5). Time for class—Covid-19 edition part 2: Planning for a fall like no other. Tyton Partners. https://tytonpartners.com/time-for-class-covid-19-edition-part-2/

Guo, L. (2022, 09 February). Using metacognitive prompts to enhance self-regulated learning and learning outcomes: A meta-analysis of experimental studies in computer-based learning environments. Journal of Computer Assisted Learning 38(3), 811-932. https://doi.org/10.1111/jcal.12650

Hodges, C. B. (2009). Self-regulation of learners in an asynchronous university math course. *The Quarterly Review of Distance Education, 10*(2), 233–237.

Hong, W., Bernacki, M. L., & Perera, H. N. (2020). A latent profile analysis of undergraduates' achievement motivations and metacognitive behaviors, and their relations to achievement in science. *Journal of Educational Psychology, 112*(7), 1409–1430. https://doi.org/10.1037/edu0000445

Hung, M. L., Chou, C., Chen, C. H., & Own, Z. Y. (2010). Learner readiness for online learning: Scale development and student perceptions. *Computers & Education, 55*(3), 1080–1090. https://doi.org/10.1016/j.compedu.2010.05.004

Ibabe, I., & Jauregizar, J. (2010). Online self-assessment with feedback and metacognitive knowledge. *Higher Education, 59*(2), 243–258. http://dx.doi.org/10.1007/s10734-009-9245-6

Justice, E. M., & Dornan, T. M. (2001). Metacognitive differences between traditional-age and non-traditional age college students. *Adult Education Quarterly, 51*, 236–249. https://doi.org/10.1177/074171360105100305

Keengwe, J., & Kidd, T. T. (2010). Towards best practices in online teaching and learning in higher education. *MERLOT Journal of Online Teaching and Learning, 6*(2), 533–541. https://jolt.merlot.org/vol6no2/keengwe_0610.pdf

Kitsantas, A., Winsler, A., & Huie, F. (2008). Self-regulation and ability predictors of academic performance during college: A predictive validity study. *Journal of Advanced Academics, 20*(1), 42–68. https://doi.org/10.4219/jaa-2008-867

Knowles, M. S. (1972). Innovations in teaching styles and approaches based on adult learning. *Journal of Education for Social Work, 8*(2), 32–39. https://doi.org/10.1080/00220612.1972.10671913

Knowles, M. S. (1977). Adult learning processes: Pedagogy and andragogy. *Religious Education, 72*(2), 202–211. https://doi.org/10.1080/0034408770720210

Kurt, S. (2020, July 11). Andragogy Theory—Malcolm Knowles. Educational Technology. https://educationaltechnology.net/andragogy-theory-malcolm-knowles/

Lawanto, O., Santoso, H. B., Goodridge, W., & Lawanto, K. N. (2014). Task value, self-regulated learning, and performance in a web-intensive undergraduate engineering course: How are they related? *MERLOT Journal of Online Teaching and*

Learning, 10(1), 97–111. https://jolt.merlot.org/vol10no1/lawanto_0314.pdf

Lehmann, T., Hähnlein, I., & Ifenthaler, D. (2014). Cognitive, metacognitive and motivational perspectives on preflection in self-regulated online learning. *Computers in Human Behavior, 32*, 313–323. https://doi.org/10.1016/j.chb.2013.07.051

Means, B., Toyama, Y., Murphy, R., Bakia, M., & Jones, K. (2009). Evaluation of evidence-based practices in online learning: A meta-analysis and review of online studies. U.S. Department of Education: Office of Planning, Evaluation, and Policy Development Policy and Program Studies Service. https://files.eric.ed.gov/fulltext/ED505824.pdf

Mezirow, J. (2000). *Learning as transformation: Critical perspectives on a theory in progress* (1st ed.). Jossey-Bass.

Moshman, D. (2018). Metacognitive theories revisited. *Educational Psychology Review, 30*(2), 599–606. https://doi.org/doi/10.1007/s10648-017-9413-7

Nückles, M., Roelle, J., Glogger-Frey, I., Waldeyer, J., & Renkl, A. (2020). The self-regulation-view in writing-to-learn: Using journal writing to optimize cognitive load in self-regulated learning. *Educational Psychology Review, 32*(4), 1089–1126. https://doi.org/10.1007/s10648-020-09541-1

Nurajizah, U., Windyariani, S., & Setiono, S. (2018). Improving students' metacognitive awareness through implementing learning journal. *JPBI (Jurnal Pendidikan Biologi Indonesia), 4*(2) , 105–112. https://doi.org/10.22219/jpbi.v4i2.5788

O'Loughlin, V. D., & Griffith, L. M. (2020). Developing student metacognition through reflective writing in an upper-level undergraduate anatomy course. *Anatomical Sciences Education, 13*(6), 680–693. https://doi.org/10.1002/ase.1945

Rosnaeni, R., Zuhri Dj, M., & Nur, H., (2020). Students' metacognitive awareness and reading comprehension of narrative texts. *IJEE Indonesian Journal of English Education, 7*(1), 73–86. https://doi.org/10.15408/ijee.v7i1.17027

Sachar, C. O. (2020). Revising with metacognition to promote writing achievement: A case study. *Journal of the Scholarship of Teaching and Learning, 20*(3). https://doi.org/10.14434/josotl.v20i3.28675

Schunk, D. H., & Zimmerman, B. J. (Eds.). (1998). *Self-regulated learning: From teaching to self-reflective practice.* New York: Guilford Press.

Seaman, J. E., Allen, I. E., & Seaman, J. (2018). Grade increase: Tracking distance education in the United States. Babson Survey Research Group. http://onlinelearningsurvey.com/reports/gradeincrease.pdf

Sethares, K. A., & Asselin, M. E. (2022). Use of exam wrapper metacognitive strategy to promote student self-assessment of learning: An integrative review. *Nurse Educator, 47*(1), 37–41.

https://doi.org/10.1097/NNE.0000000000001026

Sheikh, I., Soomro, K. A., & Hussain, N. (2019). Metacognitive awareness of reading strategies, reading practices, and academic attainments of university students. *Journal of Education and Educational Development, 6*(1), 126–137. https://doi.org/10.22555/joeed.v6i1.2749

Sitzmann, T., & Ely, K. (2010). Sometimes you need a reminder: The effects of prompting self-regulation on regulatory processes, learning, and attrition. *Journal of Applied Psychology, 95*(1), 132–144. https://doi.org/10.1037/a0018080

Steiner, H. (2016). The strategy project: Promoting self-regulated learning through an authentic assignment. *International Journal of Teaching and Learning in Higher Education, 28*(2), 271–282. https://eric.ed.gov/?id=EJ1111151

Tanner, K. (2012). Promoting student metacognition. *CBE—Life Sciences Education, 11*(2), 113–120. https://doi.org/10.1187/cbe.12-03-0033

Tuckman, B. W., & Kennedy, G. J. (2011). Teaching learning strategies to increase success of first-term college students. *The Journal of Experimental Education, 79*, 478–504. https://doi.org/10.1080/00220973.2010.512318

Yarbrough, J. R. (2018). Adapting adult learning theory to support innovative, advanced, online learning—WVMD model. *Research in Higher Education Journal, 35*. https://files.eric.ed.gov/fulltext/EJ1194405.pdf

Yuruk, S. E., Yilmaz, R. M., & Bilici, S. (2019). An examination of postgraduate students' use of infographic design, metacognitive strategies and academic achievement. Journal of *Computing in Higher Education, 31*(3), 495–513. https://doi.org/10.1007/s12528-018-9201-5

Zimmerman, B. J. (1989). A social cognitive view of self-regulated academic learning. *Journal of Educational Psychology, 81*(3), 329–339. https://doi.org/10.1037/0022-0663.81.3.329

Zimmerman, B. J. (1998). Academic study and the development of personal skill: A self-regulatory perspective. *Educational Psychologist, 33*(2/3), 73–86. https://doi.org/10.1080/00461520.1998.9653292

Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory Into Practice, 41*(2), 64–70. https://doi.org/10.1207/s15430421tip4102_2

Zimmerman, B. J., Bonner, S., & Kovach, R. (1996). *Developing self-regulated learners: Beyond achievement to self-efficacy.* Washington, DC: American Psychological Association. https://doi.org/10.1037/10213-000

Zimmerman, B. J., & Martinez-Pons, M. (1988). Construct validation of a strategy model of student self-regulated learning. *Journal of Educational Psychology, 80*, 284–290. https://doi.org/10.1037/0022-0663.80.3.284