Journal of Online Learning Research (2024) **10**(3), 315-339

Examining the Self-Regulation Abilities of Students Enrolled in an Online Secondary Charter School

KAREN T. ARNESEN
CHARLES R. GRAHAM
HEATHER LEARY
Brigham Young University, USA

This exploratory research addresses the state of student self-regulation (SR) in an online secondary school. Students are more likely to be successful, especially in online schools, when they are self-regulated. Understanding these students' current SR abilities can facilitate targeted interventions. Data for this study was gathered from a student survey and interviews of students, parents, and teachers from an online secondary school. Quantitative and qualitative analysis revealed that many students perceived their SR as being adequate to strong and that students were more aware of the help-seeking and time management dimensions of SR than of the other dimensions. This awareness aligned with the structure of the school that emphasized these two SR activities. Findings also indicated that poor mental health had a strong dampening effect on a student's SR abilities and that students' understanding of motivation was tied to their ability to overcome difficulties and to complete work. Finally, students' character traits seemed to both precede and support the development and use of SR dimensions. These findings suggest that targeted support for SR dimensions; an understanding of how mental health affects SR; the role of motivation; and an emphasis on character growth can support and promote SR growth.

Keywords: self-regulation, secondary education, distance education, student motivation, school support.

INTRODUCTION

In the 14 years from 2000 to 2014, K–12 enrollment in public, full time elementary and secondary virtual schools in the United States grew from below 25,000 to over 250,000 students (Gulosino & Miron, 2017). In the 2017–18 school year, 61.3% of all K–12 schools in the United States offered at least one online course (National Center for Education Statistics, 2019). Given this growth of online learning contexts, knowing how students can succeed in such contexts has become increasingly important.

Research over the years has indicated that self-regulated students are more likely to succeed in school in any modality (Boekaerts, 1997; Gafoor & Kurukkan, 2016). In online modalities, self-regulation (SR) is even more important. It helps students deal with the increased autonomy inherent in online courses (Barnard et al., 2009), decreases the pull of distractions (Ge et al., 2021), and increases motivation (Pintrich, 2004; Wang et al., 2013).

The purpose of this exploratory research is to examine the self-regulation abilities of junior high and high school students enrolled in an online secondary school. Such information can inform stakeholders about the students' SR needs, leading to better interventions and training to increase SR and support student success in online courses.

LITERATURE REVIEW

The switch to emergency rote teaching during the COVID-19 pandemic revealed several issues that influence the effectiveness of online learning. One of these issues was the need for students to be self-regulated learners (SRL). Self-regulated learners were more highly engaged in their courses (Topping et al., 2022) and exhibited better coping strategies for dealing with the sudden switch to online learning (Sinring et al., 2022). On the other hand, students with low SR suffered. Assaf and Nehmeh (2022) concluded that social presence and learning presence, so important in online learning, depended in part on a student's SR abilities. They found that 35% of 9th and 12th grade students who experienced online learning during the pandemic (N=928) never shared problems they had with learning, 44% never communicated with a peer, and 30% felt that communicating with a peer would not help them. Additionally, switching to an online space was difficult for students: they were inattentive, disinterested, lackadaisical, and unengaged (Wood et al., 2022). Even under improved online design and instruction, such attitudes could hamper a student's learning. Thus, helping students improve their SR and supporting them in the process could increase student's ability to succeed in secondary online modalities.

History of Self-regulation

Self-regulation has a long history. Researchers first became interested in the concept of SR in the 1970s and early 1980s. In 1986 at a meeting of the American Educational Research Association, researchers met together to organize the ideas of metacognition, goal setting, learning strategies, self-efficacy, and other qualities related to the types of student characteristics that led to student success. Their discussion led to a simple and inclusive definition of self-regulated learning: "The degree to which students are metacognitively, motivationally, and behaviorally active participants in their own learning process" (Zimmerman, 2008, p. 167).

Metacognition is the ability to adjust learning by analyzing the processes that lead to learning, such as planning, monitoring actual learning that occurs as a result of effort, reflecting, and making adjustments as needed (Anthonysamy et al., 2020; Cho & Shen, 2013). Rivers, et al. (2022) especially emphasize the value of metacognition in leading students to apply the effort and persistence that such thinking suggests. Motivation pertains to the level of value associated with a learning subject or task. It influences students' goals and their readiness to participate in, persist in, give effort to, learn from, and complete a learning task (Khiat & Vogel, 2022). It also has an impact on the types of learning strategies students use (Hariri et al., 2020). Behavioral components of SR build on the metacognitive and motivational components. They are the physical acts and energy required to begin and accomplish learning activities (Hanny et al., 2023).

From these beginnings the field of self-regulated learning has grown to embrace a number of different theoretical frameworks and constructs (Zimmerman, 2015). Zimmerman's model (Cleary & Zimmerman, 2004; Wandler & Imbriale, 2017) is typical of many which focus on student-controlled and student-regulated processes. This model depicts self-regulated learning as occurring in cyclical phases: a forethought phase, a performance phase, and a self-evaluation phase. The cycle is complete when the students' self-evaluation informs and modifies the next forethought phase, in which students set new goals based on the results of their self-evaluation at the end of the cycle.

Development of SR

Although most students seem to acquire some level of SR, its growth is neither certain nor predictable. Many actors seem to influence it. Students develop rudimentary tools of SR even as young children. These skills appear to continue to develop during the primary and secondary school years (Muijs & Bokhove, 2020); however, some evidence suggests that secondary school students are less confident in their SR abilities than are primary

school students, perhaps suggesting that they need more SR support (Hariri et al., 2020; vanAlten et al., 2021). Besides the natural maturation of SR, students also develop such skills from interaction with others, watching and imitating peers, and SR instruction (Huh & Reigeluth, 2018; Muijs & Bokhove, 2020). Given the many avenues of SR development, it is not surprising that students have different levels of SR and that their ability to use SR skills varies widely. In addition, asynchronous online students frequently have reduced exposure to peers they might emulate (for good or bad), limiting one of the avenues of SR growth. These possible differences in growth opportunity, especially with online students, emphasize the need for understanding individual students and the variety of their SR abilities, so teachers, parents, and administrators can begin to address them.

Outcomes of SR

Self-regulation is often tied to positive academic outcomes. In a review of the K–12 literature, Elhusseini et al. (2022) analyzed 46 studies with a total of 5,255 participants. They found an overall effect size for SR of 0.883, with kindergartners having a somewhat lower effect size and high school students having a somewhat higher effect size. Self-regulation also influences academic outcomes indirectly. Wang et al. (2013) found that the use of effective strategies (an element of SR) increased motivation, which in turn led to both greater satisfaction with the course and better performance.

Self-regulation also contributes to several other positive outcomes. In online or technology rich contexts, Ge et al. (2021) found that self-regulated 7th and 8th grade students were able to monitor (self-observation) and modify (self-evaluation; goal setting) their use of technology to minimize distractions and the undesired influences of technology. Students with good SR also tended to have the ability to develop coping strategies, as well as have good psychological capital to strengthen them during difficult situations (Dembo et al., 2006; Sinring et al., 2022). Self-regulation also helped students maintain effort (Koçdar et al., 2018) and motivation (Pintrich, 2004). In addition, research suggested that SR may be the most necessary student attribute in student success, without which such qualities as resilience, optimism, and self-efficacy are insufficient for students to succeed in an online setting (Aryani & Umar, 2022; Sinring et al., 2022). Self-regulated students were aware of their strengths and weaknesses, so self-evaluation tended to be more accurate and students more capable of making needed adjustments (Sinring et al., 2022).

Self-regulation is also cited as an important factor in engagement and in the creation of a community of inquiry. Sun and Rueda (2012) found that SR was significantly correlated with three types of engagement (behavioral, emotional, and cognitive) in online courses. Topping et al. (2022), in a systematic literature review of the effectiveness of online and blended learning,

similarly found that understanding and SR were the two most frequently mentioned indicators of student engagement. In addition, Kilis and Yildirim (2018) added "regulatory presence" (p. 62) to the Community of Inquiry framework, noting that the presence of SR made a significant contribution to the framework.

Other research indicates that SR is even more important in online learning. While the flexibility of online learning allows greater freedom to pursue learning activities in various times, paths, and places, it also requires greater autonomy and self-direction on the part of the student (Assaf & Nehmeh, 2022; Jansen et al., 2022). Self-regulation helps students develop the mindsets, skills, and abilities that lead to the wise use of this autonomy (Barnard et al., 2009). In addition, the lack of SR seems to be more detrimental in an online modality than in an in-person modality (Tuckman, 2005). Elvers et al. (2003) researched the procrastination tendencies (showing low regulation of time) of 54 students enrolled in a 1st-year psychology course. Students were randomly assigned to an online section or a lecture section of the course. Although students in both classes procrastinated to a similar degree, procrastination had a significantly different, detrimental effect on students' course outcomes in the online section than it did on those of students in the lecture course. The researchers hypothesized that the regular class meetings of the lecture section softened the impact of students' procrastination because they were exposed to the content in the lecture, even if they put off the assignments. However, web data from the online course indicated that procrastinating students in the online course did not access the content until just before the unit tests were given, magnifying the effects of their procrastination.

Although the importance of SR is well established, much of SR learning research has explored how SR affects various learning contexts, populations, or outcomes (Blume et al., 2022; Forrest, 2022; Sinring et al., 2022; Türkben, 2019). Other research has examined interventions used to increase SR (see Dignath & Büttner (2008) for a meta-analysis of interventions used in primary and secondary contexts), and still other research has used surveys to explore students' perceptions of SR, which they analyze using descriptive and/or correlational statistics (Cho & Yoo, 2017; Joo et al., 2014; Samruayruen et al., 2013). However, little has been done to explore qualitatively how students, parents, and teachers perceive students' SR, especially in online secondary settings, thus limiting the understanding of the SR abilities of online secondary students and how these abilities affect learners' approaches to and success in their learning. Understanding students' current SR abilities and needs is a first step in meeting them. This research attempts to fill that gap by allowing students to speak in their own voice about their successful and struggling online experiences and inviting parents and teachers to add their perspective. This qualitative approach allows a more

nuanced and personal view of how students understand their experiences in online learning, thus increasing understanding of online students' current SR abilities and how to best help them improve. We address this need using the following research questions:

Research Questions

1. How do secondary students enrolled in an online charter school perceive and describe their efforts to self-regulate their learning?
2. How do parents of a secondary student enrolled in an online charter school perceive their student's self-regulation attitudes and skills?
3. How do teachers in an online secondary charter school perceive their students' self-regulation attitudes and abilities?

METHODS

The purpose of this study was to explore secondary students' perceptions of and experiences with SR, as well as those of their parents and teachers. Because we were interested in their perceptions and experiences in developing and using SR, we primarily used a qualitative lens. However, to complement and add insight into the qualitative data, we also used a student survey to quantitatively explore perceptions of SR and used descriptive statistics to describe the findings.

Theoretical Framework

This research was grounded in a cyclical phase model of SR (Zimmerman & Risemberg, 1997), which takes place in three phases: a forethought phase, a performance phase, and a self-reflection phase. Dimensions in each phase indicate the types of activities a self-regulated student might engage in during that phase. Table 1 shows the phases and dimensions of SR that are frequently used in each phase. These phases and dimensions provided the framework for how we looked at SR in this study. For this research we chose dimensions from each phase (italicized in Table 1) to focus on and to represent typical SR activities.

Table 1

Phases and Dimension of a Cyclical Phase Model of Self-regulated Learning

Forethought Phase	Performance Phase	Self-Evaluation Phase
Goal setting	Study strategies	*Self-evaluation*
Planning	*Time management*	Self -reflection
Motivation	*Environment structuring*	
	Help-Seeking	
	Self-control	
	Self-observation	

Context of the Study

This study took place in a secondary (7–12) online charter school in the Western United States. In the 2023–2024 school year 923 students were enrolled in the school. Most of the students were white (93.39%), but the student body also included students of Hispanic/Latino, American Indian, Asian, African American/Black, and Pacific Islander origins. Males represented 46.37% of the school population; and females, 53.63%. In addition, 14.63% of students were economically disadvantaged, and 19.18% qualified for special education services because they had an Individualized Education Plan (IEP). An additional 12% of students received accommodation under Section 504 rules.

Participants

The participants in this research included 156 7–12 grade students. We introduced the students and parents to the research at an in-person school orientation before school started. We talked to students about the research and had them sign an assent form to take an online SR survey and to participate in an interview. Their parents also signed a consent form. Four 18-year-old students signed a consent form. In addition, 62 parents and 26 teachers agreed to be interviewed and signed a consent form. Teachers were informed of the study in an email sent from the school administration. Of the students who gave consent 106 took the survey. Because we needed only 12 students (who had also taken the survey), 12 parents, and 12 teachers for interviews, we randomized the names in each group and invited the first twelve to participate in an interview. If any of the initial 12 declined to be interviewed, the next person on the list was contacted. We continued this process until we had 12 participants from each group.

Data Collection

Data was collected from a variety of sources to allow data triangulation. The sources included the following.

SR survey instrument

An SR survey was administered to all students enrolled in the study. It was based on a validated instrument (Arnesen, 2024), derived from the Online Self-Regulated Learning Questionnaire (OSLQ) survey, which has been found to be acceptable for use in online settings (Barnard et al., 2009) and was modified to fit the context and vocabulary of the school. It included 24 questions covering five of the dimensions or processes of Zimmerman's SR model: goal setting, time management, help seeking, environment structuring, and self-evaluation (Zimmerman & Risemberg, 1997). Using a 6-point likert scale, students' choices ranged from strongly disagree to strongly agree.

Interviews

We interviewed 12 students in semi-structured, 20–30-minute interviews. These interviews allowed us to investigate more deeply the students' perceptions and experiences in online learning and in self-regulation. We also explored how and why they organized their time and study space; the strategies they used while studying; their ability to seek help if needed; and their processes for self-evaluation, goal setting, and change.

In addition, we interviewed 12 parents in semi structured, 30–40-minute interviews, giving a parent's perspective on the students' SR practices and abilities. In these interviews we explored the parents' observations of their students, what they felt helped their students succeed in their studies and what hindered them.

Finally, we interviewed 12 teachers in a variety of different subjects. We asked about their perceptions of how students regulated themselves and the impact of these SR activities on the students' academic outcomes. We also asked how they supported their students.

All interviewees received a $25.00 gift card. The researchers de-identified the data and kept it in a password-protected file. The school received only our final analysis.

Data Analysis

The purpose of this research was to investigate how a group of students, parents, and teachers understood, responded to, and interpreted the SR demands and processes associated with online schooling. This type of inquiry calls for a qualitative approach. Therefore, our data analysis was primarily qualitative, with descriptive statistics adding context and supplementing the interpretation of the qualitative data. The data and types of analysis as they relate to the research questions are summarized in Table 2.

Table 2

Data and Analysis Related to the Research Questions

RQ	Data	Analysis
RQ1: How do secondary students enrolled in an online charter school perceive and describe their efforts to self-regulate their learning?	Student survey scores; interviews	Descriptive statistics for the 5 dimensions of the survey; thematic analysis of the qualitative data
RQ2: How do parents of a student enrolled in an online charter school perceive their student's self-regulation attitude and skills?	Parent interviews	Thematic analysis
RQ3: How do teachers in an online charter school perceive their students' self-regulation attitudes and abilities?	Teacher interviews	Thematic analysis

Quantitative Analysis

The SR survey data were analyzed descriptively, showing means and standard deviation for the total score, as well as for each subset score.

Qualitative Analysis

Researchers approached coding and analysis in a way that helped establish trustworthiness. Therefore, it was critical that the coding process was both transparent and thorough.

As recommended by Nowell et al. (2017), one researcher read the interviews several times separately and then as an entire group, looking for and recording patterns, themes the data suggested, as well as questions and insights. Next, one author coded the three groups of interviews (student, parent, teacher), using the process outlined by Attride-Stirling (2001). Each interview was first coded in basic thematic units. Although the researcher coded SR dimensions (the cyclical phases and SR abilities and strategies and the dimensions that correlated with each phase), she also noted and coded other themes that emerged from the data. These themes gave added insight into the participants' experiences with or perceptions of students' SR. These basic themes were coded into organizing and global themes. After coding each interview, two authors reviewed in-depth the codes of one student, one parent, and one teacher, looking for assumptions and other or alternative themes, adding insights, as well as questioning incomplete or confusing ideas. The researchers discussed these suggestions and modified the code book accordingly. Once the interviews had been coded, the themes were collected and organized according to the global themes. One of the authors reviewed the coding structures for accuracy and completeness. Table 3 shows a sample of the final coding structure.

Table 3
Sample of Coding Structure

Global Theme—SR Dimensions	
Organizing Theme 1: Environment	Examples from Interviews
Basic Theme: Description	I have a desk, but mostly study just on the couch and I bring dining room chairs over to use as tables. I have three over here right now out of four.
Basic Theme: Distractions	I feel like my phone distracts me a lot, and TikTok, I get distracted really bad when I look at TikTok, but I feel like when I put my phone down and I'm by myself, I can normally get what I need to do.
Organizing Theme 2: Time Managment	Examples from Interviews
Basic Theme: Breaks	We have a tree house, and so I walk out and just look at the mountains for a minute just to help my eyes, because staring at a screen all the time is damaging. So, I try to make sure I look at something far away.
Basic Theme: Scheduling	Student: I was mentioning earlier my Google Sheet, so I put all my assignments in it, and I found that if I put math on Monday, it never gets done. Math is not a Monday task. I usually put one of my more interesting classes that I enjoy, like astronomy, on Mondays, because that gets me engaged and interested.
	Parent: She definitely has more of a schedule now. She even asked me for a planner so that she can start taking notes of things like that. And she's finding that having a planner this year and writing things out is much more efficient for her, especially when it comes to her schoolwork.
Basic Theme: Procrastination	I am a very big procrastinator, and I am always like, I'll do it tomorrow. I'll do it tomorrow, I'll do it tomorrow. And so, I keep pushing it off until it builds up and gets too stressful for me to think about.

Trustworthiness

To aid our analysis, we used methods based on Creswell and Poth's (2018) processes of establishing trustworthiness, including data triangulation, peer debriefing (as described earlier), member checking, and negative case analysis.

Data Triangulation

In order to triangulate the data, we collected data from four sources—the SR survey and students', parents', and teachers' interviews, each giving a different view of students' SR.

Member Checking

We sent all interviewees a copy of the transcript of their interview and invited them to respond by a certain date if they had any changes they would like to make. Ten participants indicated that they were satisfied with the interview. The rest returned no response.

Negative Case Analysis

Finally, one author conducted a negative case analysis of all the qualitative data, looking for segments of the data that contradicted or were not represented in the final thematic structure.

Ethical Considerations

Because most of the research participants in this study were minors, they were considered a vulnerable population. To avoid any sense of coercion, we obtained both parental consent for their child to participate in the survey and an interview, as well as assent from each student. Parent and teacher participants also signed a consent document. The consent and assent documents explained their participation in the research process and assured participants that the school would not see any identifying data from the students, parents, or teachers, and none would experience any repercussions from the school or the research team. The research was approved by the institution's review board before any research was begun.

FINDINGS

The quantitative and qualitative data both add richness and variety to an understanding of the research questions. We will discuss each in turn.

The Survey

The quantitative survey data measured the students' SR perceptions overall and in five SR dimensions. Table 4 shows the mean, standard deviation, and percent for each.

Table 4

Means and Standard Deviations of Survey Scores (*n*=106)

Dimension	Help Seeking	Self-Evaluation	Time Management	Goal Setting	Environment Structuring	Total
Possible Score	24	36	24	24	36	144
Mean	20.3	28.3	17.8	17.6	25.4	109.3
Standard Deviation	2.8	3.9	3.8	3.8	4.6	16.1
Mean as Percent	84.7%	78.6%	74.2%	73.5%	70.6%	75.9%

Note: Survey items were measured on a 6-point scale, from strongly disagree to strongly agree.

These numbers indicate that students generally perceived their self-regulation abilities for each item to be between "somewhat agree" and "agree." However, the standard deviations suggest that the answers varied widely.

Of note, is the strength of the help seeking dimension. It was 6.1% higher than that of self-evaluation, the next highest percent. The range of the other dimensions combined was 8%. As shown later in the qualitative findings, the online school these students attended emphasized students' seeking help. The school also offered significant help in time management; however, the percentage for this dimension was not as strong as that of help-seeking, perhaps because time management requires more student effort than does help-seeking.

Two phenomena peculiar to this school may influence the outcomes of the survey. First, the school demographics are unusual. Teachers described their school grades as tracing an "inverted bell curve," with more students at both ends of the curve than in the middle. Second, they indicated that about 20% of their students rarely engaged in the coursework. Thus, it is unlikely that a representative number of such students took the survey, which may have skewed the data to the right. Second, the data may also have been influenced by the unusually high number of students (31.18%) who received services through an IEP or accommodations through a 504 plan. However, interviews with special education teachers indicated that their students have similar SR needs and successes as do other students in the school. Finally, the nature of the instrument relies on perceptions; it measures how the students perceive they are performing in relation to each survey statement. Students may have different ways of interpreting each statement, judging their ability in the task described in the statement, as well as applying the rating scale.

Student Patterns

Interviews suggested that the participants often saw SR as an outcome rather than a process. Teachers reported that between 75% and 85% of the students evidenced some level of SR and eventually passed their classes, with 15% to 25% who either did not engage at all or who did not complete enough work to pass. Students, parents, and teachers described the students as fitting into one of five different patterns:

1. Students who started and finished the term strongly. They worked consistently throughout each week, turning assignments in early, so they could receive feedback and improve their work.
2. Students who started and finished strongly but who often procrastinated during the week, then rushed on Thursdays or Fridays to meet the Friday 6:00 p.m. deadline.
3. Students who started the semester strongly, but their effort waned early in the term. Some of these students caught up the last few weeks of the term and were able to pass their classes.

4. Students who engaged intermittently throughout the term but did not pass the class.
5. Students who failed to engage in any way with either the teachers or the courses.

Generally, students who passed their classes (passing with a D or higher) belonged to the first three groups. In their interviews these students also tended to show higher SR habits and abilities, with the first group showing more use of and sophistication in SR. However, many students who passed their classes still struggled with procrastination, time management, goal setting, and distractions.

Being a Good Student

To understand the students' concept of self-regulation, an unfamiliar idea to many of them, we asked the 12 students we interviewed to describe a good student. Some of their answers included dimensions of SR: one spoke of goal setting; one, the structuring the environment; and none, of self-evaluation. Help-seeking and time management, however, both stood out, with four students discussing help-seeking, and ten, time management. The fact that 83.33% of the interviewed students mentioned time management could indicate that, although they did not necessarily perceive they did well with time management, they did recognize its importance.

Students also included other elements in their definition of a good student, such as "they don't have . . . to have a lot of motivation for school. . . . just have to do your best" (Julia); "working six hours a day" (Jacob); "nice to everyone" (Ben); and "not feeling bad about being critiqued" (Emily). In addition, nine of the students said they cared about being a good student and seven reported that they saw themselves as a good student. These definitions vary widely with only a few touching on self-regulatory abilities.

Self-regulation Dimensions

Of the five dimensions in the survey, students and parents had little to say about goal setting, environment structuring, and self-evaluation in the interviews. When students talked about goal setting, they mentioned goals for completing an assignment (with six students making completion goals), grades, and future goals (career, further education) that helped motivate them. None of the goals dealt with developing SR; all were academic. Ethan, however, was more deliberate with his goals. He recognized his weaknesses—spelling and reading comprehension—due to dyslexia. He planned to take classes targeted to those needs during the summer and set goals for improvement through activities he did on his own time.

When asked about their study environment, all the students and many of the parents described students studying at a desk, table, or other organized space, but often reading on their beds. Common environmental distractions included their phones and, interestingly, their pets. Two students were distracted by the desire to practice musical instruments. Although students and parents asserted that they had a place to study, Bethany, an 8th grade math teacher, while in a video meeting with a student, noticed the student was "sitting in a room with four other people and the TV's on." "I can't focus [in that kind of environment]," she added. "And I'm a math teacher." Students' having a space to study did not necessarily indicate they were using the space effectively.

Finally, students showed only rudimentary use of self-evaluation. For example, Julia, Jacob, and Ben were unable to describe their weaknesses as students, how their parents helped them, or why their motivation varied. Other students were a little more thoughtful. Brooklyn understood that she procrastinated when she was overwhelmed but was unable to describe what she might do differently. Michael noticed when his study strategies were not working, and he tried "a different way." Megan also discovered that "if I'm not in my room, I'm a lot less distracted because I have a lot of what I'm interested in doing in my room. All my painting stuff and my sketchbook and my book that I like to read." The lack of self-evaluation could hinder students' efforts to change. If they did not understand their limitations, they would have a difficult time developing strategies for overcoming them.

Help-seeking

Help-seeking was emphasized at the school. All instruction was online on demand. Teachers held one 1-hour online, optional face-to-face meeting each week, graded papers, and spent the rest of their time helping individual students. Christopher, a psychology teacher explained that "every week we are supposed to reach out to all of our students" and noted that "the students that are needing the extra support . . . respond back to me." Computer programming teacher, Diana, described how students learn to reach out: "I still have students that will be sorry to bother you. [But] this is what I want. . . . Students do better reaching out because of the setup here [and] because. they have a good experience when they do."

Students and parents seemed to agree. All 12 students and 12 parents described a process of help-seeking. As reported by the students and parents, seven students turned for help first to their parents then to their teachers. Twelve went directly to their teachers, and five went to their parents and only rarely to their teachers. The students saw their parents as an easy first step, especially in the evenings when teachers were not available. All students at some time turned to a teacher for help and usually had good

experiences. Even when they cited a negative experience, they were quick to add, as Julia did, that "most of my teachers are great. They're always willing to help."

Students' help needs varied. They occasionally needed technology help, instructions on how to submit an assignment, or problems with a grade, but most sought help with specific assignments. Megan described that she soon learned to go "to my teachers a lot more instead of just sitting there for two hours trying to figure out what this homework wanted from me." Students felt that teachers responded quickly, gave quick answers, or spent more time if needed.

Two students who rarely reached out felt they did not need help. Ethan reached out to teachers as needed, usually for grade or submission problems. He was a diligent, self-starting student and usually turned to his mom when he did need help. Alternatively, Jacob felt that "most of the time I don't need help," but he was often behind, and his mother had to remind him several times a day to do his work. He admitted that he "wouldn't [work] otherwise." Other students were afraid. Lauren, for example, saw "being scared to ask for help" as the biggest challenge of online learning. Erica explained that her daughter was "pretty close" to being self-regulated, except that she did not "always feel comfortable asking for help." Teachers sometimes saw this same fear. World Civilization teacher Brandi, indicated that she "still" had some students who felt dumb if they "reached out to their teacher."

Sometimes students needed and received long-term help. Bethany described a first-year online student who was struggling with her math assignments. The student recognized that she was not "doing as well as I thought I would" and started meeting with Bethany every week. This individualized instruction was a core principle of the school.

Time Management

The school also emphasized time management. Teachers were required to have a suggested schedule for each week's work. The school provided staff to help individual students learn to create their own schedule. This emphasis seemed to influence the students' understanding of success. In their interviews 10 students, even those who were not good planners themselves, saw being able to plan and schedule as important. Those students who did not keep up with their assignments—Ben, Jacob, and Emily—confessed to doing very little planning. They said they had a hard time "getting into" work at the beginning of the year, often got behind, procrastinated work on difficult assignments, and started working only when a deadline loomed or their parents "nagged" them.

Students who planned well, on the other hand, often understood the best ways to organize their work throughout the week. Many of them planned a four-day week, so they had no work on Friday. They also tended to organize their weeks around their hardest subjects, scheduling them when they knew they would have the will to do them. Ethan, for example, knew he could not do all his English assignments in one sitting. He spread them throughout the week but planned other courses for just one day. Megan created a Google Sheets checklist, where she listed her assignments for the week. She planned her lighter days on Mondays and Wednesdays and her more difficult courses on Tuesdays and Thursdays, while Grace planned her most difficult courses for Monday. Hannah, who usually planned well, was moving at the beginning of the year. To keep herself current in her studies, she planned just one day at a time, then reached out for help as soon as she needed it. Using this method, she was able to keep up, even in a disorganized time for her family. These students understood their own learning needs and designed a schedule that met those needs.

Some parents saw their child grow in time management, reporting that they experimented with different time management methods or grew into independence over time. Some showed elementary time management behaviors such as setting aside certain times to study but not planning what to do during that time. Megan, a senior and in her 6th year at the school, explained that at first her parents helped her plan each week, creating a structure and helping her fill in the assignments. Later they created only the structure, and Megan filled in the assignments. At one point a school staff member helped her become more self-aware, so she could plan when to do different types of assignments. Finally, she came up with a plan that worked for her, which she continued to use independently and successfully. Her growth demonstrates the need for long-term support in helping students develop SR.

Motivation

Although not directly questioned about motivation, seven parents, eight teachers, and all the students referred to its impact on learning. Jennifer, Rachel, and Michelle described their children as finding "internal motivation" or motivation as a result of future plans. Amber, however, spoke of her son as being motivated only for subjects he found interesting.

Teachers saw a clear delineation between the motivation of students who were and were not self-regulated. Self-regulated students were self-motivated. They "tell me exactly what they have going on, exactly when they're going to do school, exactly what their schedule is. And their parents have no idea because they don't have to worry about it" (Diana). These students "find joy in doing their work" (Brandi). They "have a lot more fun," because "they finish things early and hav[e] less stress" (Christopher). Stu-

dents with low SR "don't care." They "want to graduate, but not by doing this work" (Diana). Both Brooke and Kari noticed that such unmotivated students struggled just to log in. In spite of seeing the differences in motivation, the teachers struggled to explain it. Stacy summarized their confusion: "Some are just self-motivated, and I don't know what it is that makes that person."

The students' thoughts about motivation may shed light on this confusion. For students who struggled with SR and completing their work, motivation was a feeling that was largely out of their control. It ruled their ability to work diligently. Brooklyn, for example, explained that the first five weeks of school, "I barely opened my laptop at all just because I wasn't really motivated to do it." She continued, "It's mostly when I *feel* motivated, I do it. And when I don't, I don't" [emphasis added]. She could think of nothing to help her increase motivation. Jacob's explanations were similar. He said, "When I don't feel like it, it's really difficult to get the work done." He had a hard time starting assignments because of "the lack of motivation and the monotony." These students' ability to work was hindered by their feelings.

On the other hand, students with higher SR did not see motivation as being tied to their feelings or their ability to work. Julia's thoughts are indicative of the seven students who were able to work diligently, even when they did not feel like it. She said, "There are "days where I don't want to do my schoolwork. . . . But I just do it. . . I know that if I don't get my school done, I'm not going to get where I want to be." Ethan concurred. When he did not feel like working, he told himself, "It's not going away. You still need to do it." Alyssa was able to "force myself to do it." These students were influenced by future goals, their determination to succeed, and an ability to do work that might not immediately appeal to them. They did not seem to need to be excited about the work or even engaged in it. They simply decided they would do what needed to be done.

Mental Health

Perhaps unsurprisingly poor mental health seemed to disrupt every dimension of SR, exerting a dampening effect on students' SR abilities. Students' mental health issues included ADHD, obsessive compulsive disorder, anxiety, depression, past trauma, various degrees of autism, and Tourettes. Parents and students described specific ways mental illness impacted their schoolwork. Alyssa, who was usually able to complete work despite low motivation, reacted differently when mental health issues flared up. She explained that during these times, "I don't cope very well. I feel like I just shut down . . . and even if I do my school, it doesn't mean anything." Rachel, whose daughter struggled with both obsessive compulsive disorder and anxiety, spent her first year in the school involved in 15 hours of therapy

a week, a significant hindrance just in terms of time. Jennifer's daughter worked with a therapist and took medication to deal with her mental health issues. Yet, even with these supports, Jennifer described her daughter's progress as a "yo-yo effect." Some weeks she was ahead, and the next week did nothing. Mental health issues are complicated and often need extended work before seeing progress. Self-regulation skills and scaffolding are particularly crucial for these students, and they may need individualized and innovative SR instruction and support to help them succeed in their studies.

Student Characteristics and Self-regulation

A final finding of note was the prevalence of interviewees who saw certain character traits as being essential to student success in an online school. These characteristics (organized below into three groups) seem to both precede and support the development of SR.

The first group included a strong work ethic, diligence, and effort. These traits assured that students had the strength and endurance to persevere, especially when concepts, learning outcomes, or activities were difficult. Julia explained that to work well you have to "put effort into it." Ethan noted that he always tried to "fix things I get wrong." He described that on one math assignment, he got 97%. "I think a lot of other students" wouldn't care. "But I actually went in and tried to figure out what I did wrong." In addition, Ethan spent time learning ideas that were not required in the course and reading science books. Similarly, Emily noted that "I like to work rigorously on my own, and I'm not afraid to go outside the curriculum to learn more." Brandi noticed that diligent students turned in assignments early in the week, giving them time to read feedback and redo assignments. Working diligently and putting effort into work were character traits that facilitated students' ability to manage time and to set goals.

A second character trait (described by parents and teachers) of self-regulated students was being proactive. Proactive students checked their assignments, grades, and feedback. If they did not do as well as expected, they asked their teachers for help or found resources on their own. They went beyond what was required either to increase understanding or explore new ideas or topics. One teacher spoke of students who "start asking questions before I've even presented them information." They wanted to be "on top of it before the class even start[ed]." Being proactive strengthened SR dimensions such as help-seeking, self-evaluation, and goal setting.

A third group of character traits included being responsible, independent, accountable, and autonomous. Stacy said of these students, "You don't have to ask them to do anything. They do everything on their own. They instigate everything." Independent students did not need reminders, recognized when they needed help, and were "pretty much in charge" of themselves. Hannah, for example, accepted responsibility for her actions involving schoolwork.

She generally scheduled and worked on her own. However, if she found herself struggling, she proactively and independently enlisted others' help: "Tell them your goals and aspirations," she said, "then ask them to help you be accountable." These students' personal traits facilitated help-seeking, time management, goal setting, and self-evaluation.

DISCUSSION

This research not only delineated students' perceptions and practices with SR but also suggested factors that could influence the development and use of SR.

The Role of Institutional Support and Values

This research demonstrated the importance of school culture and values. The emphasis which students, teachers, and parents gave to the help-seeking and time management dimensions of SR echoed the priorities of the school, which offered significant support in these two areas. As a result, students were more aware of their strengths and weaknesses in these two SR dimensions and did especially well in help-seeking.

As described in the Academic Communities of Engagement (ACE) framework (Borup et al., 2020), students need a certain level of academic, behavioral, and affective engagement to achieve academic success. Most are not at that level and need support. This support can come from a personal or a course community, which in this research included the institution. The institution provided support in two major ways. First, they managed instructors' responsibilities to emphasize and support individual student's help-seeking. Teachers did not engage in large group instruction; rather, they spent their school hours reaching out and responding to, helping, and advising individual students. Students appreciated this help, and many used it to avoid the disruptions caused from unanswered questions.

The emphasis on help-seeking facilitated learner-instructor interactions (Moore, 1989). Some students found interacting with instructors intimidating or unnecessary. However most came to value these interactions, which included questions over content, counsel about SR and other school success needs, problems with scheduling, and giving and receiving feedback. These interactions also allowed instructors to encourage and advise students.

Secondly, the school offered meaningful support to students in the SR dimension of time management. Teachers had a suggested weekly schedule on their homepage. They also worked individually with students in creating a workable schedule of assignments. The school provided mentors, who met individually with students who requested it, giving them scaffolded support to help them understand their own scheduling needs (for example, deciding when and how to schedule difficult or long-term assignments).

In offering these supports, the school also helped expand students' personal community support, as parents grew in understanding of their student's needs and how to help them.

Understanding Student Motivation

Students' understanding of motivation differed in students with strong SR skills and those with weaker skills. Their experiences and perceptions added insight to the motivation model proposed by Pintrich and DeGroot (1990), which consisted of three components: the students' beliefs about their ability to complete a task, their perception of the value or relevance of the task, and their emotional response to the task. Students with higher SR fit the model, especially in the first two components. They were motivated by goals for their future that necessitated their doing well and learning in school. They were not daunted by assignments that were difficult, complex, or less engaging. They felt they could complete school tasks, especially with the support available to them, and they valued the tasks because they saw them as leading to future abilities and plans.

However, students with low SR were not motivated by future opportunities, nor did they perceive school tasks as having value. Most importantly, these students responded to the concept of motivation only affectively. They saw it primarily as a feeling over which they had no control. Rather, their feeling, which they interpreted as being unmotivated, controlled their ability to even begin working. They could define nothing that would help them increase motivation or create a path for overcoming the malaise they often felt about schoolwork. Their focus on how they felt about what they had to do negatively influenced what they were actually able to do. These differing perceptions suggest that students' characteristics may have more to do with their ability to push through difficulties than their motivation.

The Importance of Student Character Traits

This research supports that of Borup et al. (2020) and Bidjerano and Da (2007). Borup et al. included in the ACE framework the idea that character is a basic element of influence on student engagement. Thus, the strength of a student's character may affect the level of SR support a student needs. Further, Bidjerano and Da found that personality and character traits can affect students' abilities in SR dimensions. Using the big-five model of personality, they ran correlational studies between the components of the model and self-regulation dimensions, concluding that personal characteristics may be the foundation from which self-regulation dimensions could grow. Although their study focused on personality traits such as extroversion or agreeableness, their findings support the qualitative findings in this study

that students may develop SR more readily and thoroughly when founded on strong character traits such as effort, diligence, independence, accountability, and proactivity. This outcome could suggest that helping students cultivate strong character traits would promote development in the dimensions of SR.

CONCLUSION

This exploratory research found that secondary students enrolled in an online school varied widely in their ability to self-regulate their learning. The results, using both descriptive quantitative data and qualitative thematic data, emphasized four themes. First, students were more conversant in the SR dimensions of time management and help-seeking, the two dimensions emphasized in the school, than in the other dimensions studied. Second, students had differing concepts of motivation. Students with higher SR abilities rarely mentioned motivation; they knew how to learn and to complete their work and did not recognize this ability as motivation. Students with lower SR abilities, however, saw motivation as a feeling, without which they could not engage in learning activities. Third, poor mental health seemed to have a dampening effect on students' abilities to manage their learning. Finally, students' character traits seemed to both precede and accompany the development of SR abilities.

Because the purpose of this research was to explore online secondary students' experiences with self-regulation through the perceptions of students, parents, and teachers, its findings are limited. This research does not address issues of how to improve SR in this population or of how SR dimensions, environment, and character interact. It is further limited by the lack of diversity in the population of students. A more diverse population may have led to different conclusions. Finally, those students who refused to engage in their coursework were unlikely to be represented in the findings, thus limiting understanding of a vulnerable population who could most use SR support.

These limitations suggest avenues for further research, including the following: intervention research that targets specific online populations; research into the types of personal and instructor support that most influence students' development of SR in online courses and the student characteristics that support this growth; and research that includes more diverse and vulnerable populations.

DECLARATIONS

The authors declare no conflicts of interest.
The authors declare no funding associated with this study.
The authors declare that permission to collect data for this study was granted by the ethics board of Brigham Young University, Provo, Utah, USA.

References

Anthonysamy, L., Koo, A. C., & Hew, S. H. (2020). Self-regulated learning strategies in higher education: Fostering digital literacy for sustainable lifelong learning. *Education and Information Technologies, 25*(4), 2393–2414. https://doi.org/10.1007/s10639-020-10201-8

Arnesen, K. T. (2024). Investigating self-regulation in secondary and higher education online contexts (ISSN: 2572-4479) [Doctoral Dissertation, Brigham Young University]. ScholarsArchive.

Aryani, A., & Umar, F. (2022). Examining the effect of self-regulation and psychological capital in the students' academic coping strategies during the Covid-19 pandemic. *International Journal of Instruction, 15*(2), 487–500. https://doi.org/10.29333/iji.2022.15227a

Assaf, J., & Nehmeh, L. (2022). The remote learning experience in Lebanon: Learners' attitudes and practices. *Pedagogical Research, 7*(1), 1–13. https://doi.org/https://doi.org/10.29333/pr/11551

Attride-Stirling, J. (2001). Thematic networks: An analytic tool for qualitative research. *Qualitative Research, 1*(3), 385–405. doi/10.1177/146879410100100307

Barnard, L., Lan, W. Y., To, Y. M., Paton, V. O., & Lai, S.-L. (2009). Measuring self-regulation in online and blended learning environments. *The Internet and Higher Education, 12*(1), 1–6. https://doi.org/10.1016/j.iheduc.2008.10.005

Bidjerano, T., & Da, D. Y. (2007). The relationship between the big-five model of personality and self-regulated learning strategies. *Learning and Individual Differences 17*(1), 69–81. https://doi.org/10.1016/j.lindif.2007.02.001

Blume, F., Irmer, A., Dirk, J., & Schmiedek, F. (2022). Day-to-day variation in students' academic success: The role of SR, working memory, and achievement goals. *Developmental Science, 25*(6), 1–24. https://doi.org/10.1111/DESC.13301

Boekaerts, M. (1997). Self-regulated learning: A new concept embraced by researchers, policy makers, educators, teachers, and students. *Learning and Instruction, 7*(2), 161–186. https://doi.org/10.1016/S0959-4752(96)00015-1

Borup, J., Graham, C. R., West, R. E., Archambault, L., & Spring, K. J. (2020). Academic communities of engagement: An expansive lens for examining support structures in blended and online learning. *Educational Technology Research and Development, 68*(2), 807–832. https://doi.org/10.1007/s11423-020-09744-x

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

Cho, M. H., & Yoo, J. S. (2017). Exploring online students' self-regulated learning with self-reported surveys and log files: A data mining approach. *Interactive Learning Environments, 25*(8), 970–982. https://doi.org/10.1080/10494820.2016.1232278

Cleary, T. J., & Zimmerman, B. J. (2004). Self-regulation empowerment program: A school-based program to enhance self-regulated and self-motivated cycles of student learning. *Psychology in the Schools, 4*(15), 537–550. https://doi.org/https://doi.org/10.1002/pits.10177

Creswell, J. W., & Poth, C. (2018). Chapter 8: Data analysis and representation. In *Qualitative inquiry and research design: Choosing among five approaches* (pp. 182–200). Sage Publishers.

Dembo, M. H., Junge, L. G., & Lynch, R. (2006). Becoming a self-regulated learner: Implications for web-based education. In H. F. O'Neil & R. S. Perez (Eds.), *Web-based learning: Theory, research, and practice* (pp. 185–202). Mahwah, NJ: Lawrence Erlbaum Associates. https://doi.org/10.4324/9780203759820

Dignath, C., & Büttner, G. (2008). Components of fostering self-regulated learning among students: A meta-analysis on intervention studies at primary and secondary school level. *Metacognition and Learning, 3*, 231–264. https://doi.org/10.1007/S11409-008-9029-X

Elhusseini, S. A., Tischner, C. M., Aspiranti, K. B., & Fedewa, A. L. (2022). A quantitative review of the effects of self-regulation interventions on primary and secondary student academic achievement. *Metacognition and Learning, 17*(3), 1117–1139. https://doi.org/10.1007/S11409-022-09311-0/FIGURES/2

Elvers, G. C., Polzella, D. J., & Graetz, K. (2003). Procrastination in online courses: Performance and attitudinal differences. *Teaching of Psychology, 30*(2), 159–162. https://doi.org/10.1207/S15328023TOP3002_13

Forrest, S. (2022). Self-regulated learning in the IB diploma programme: A qualitative comparison of strategy use by IB diploma students with learning difficulties and those with a history of high achievement. *Journal of Research in International Education, 21*(2), 139–166. https://doi.org/10.1177/14752409221122009/FORMAT/EPUB

Gafoor, A., & Kurukkan, A. (2016). Self-regulated learning: A motivational approach for learning mathematics. International *Journal of Education and Psychological Research 5*(3), 60–65. https://files.eric.ed.gov/fulltext/ED577702.pdf

Ge, J., Smyth, R. E., Searle, M., Kirkpatrick, L., Evans, R., Elder, A., & Brown, H. (2021). Perspectives from students: How to tame the chaos and harness the power of technology for learning. *Brock Education: A Journal of Educational Research and Practice, 30*(1), 74–94. https://doi.org/10.26522/brocked.v30i1.850

Gulosino, C. A., & Miron, G. (2017). Growth and performance of fully online and blended K-12 public schools. *Education Policy Analysis Archives, 25*(124), 1–42. http://dx.doi.org/10.14507/epaa.25.2859

Hanny, C. N., Graham, C. R., West, R. E., & Borup, J. (2023). "Someone in their corner": Parental support in online secondary education. *International Review of Research in Open and Distributed Learning, 24*(1), 85–105. https://doi.org/https://doi.org/10.19173/irrodl.v24i1.6664

Hariri, H., Karwan, D. H., Haenilah, E. Y., Rini, R., & Suparman, U. (2020). Motivation and learning strategies: Student motivation affects student learning strategies. *European Journal of Educational Research, 10*(1), 39–49. https://doi.org/10.12973/EU-JER.10.1.39

Huh, Y., & Reigeluth, C. M. (2018). Online K–12 Teachers' perceptions and practices of supporting self-regulated learning. *Journal of Educational Computing Research, 55*(8), 1129–1153. https://doi.org/10.1177/0735633117699231

Jansen, R. S., van Leeuwen, A., Janssen, J., & Kester, L. (2022). Exploring the link between self-regulated learning and learner behaviour in a massive open online course. *Journal of Computer Assisted Learning, 38*(4), 993–1004. https://doi.org/10.1111/jcal.12675

Joo, Y. J., Joung, S., & Kim, J. (2014). Structural relationships among self-regulated learning, learning flow, satisfaction, and learning persistence in cyber universities. *Interactive Learning Environments, 22*(6), 752–770. https://doi.org/10.1080/10494820.2012.745421

Khiat, H., & Vogel, S. (2022). A self-regulated learning management system: Enhancing performance, motivation and reflection in learning. *Journal of University Teaching & Learning Practice, 19*(2), 43–59. https://doi.org/https://doi.org/10.53761/1.19.2.4

Kilis, S., & Yıldırım, Z. (2018). Investigation of community of inquiry framework in regard to self-regulation, metacognition and motivation. *Computers and Education, 126*, 53–64. https://doi.org/10.1016/j.compedu.2018.06.032

Koçdar, S., Karadeniz, A., Bozkurt, A., & Buyuk, K. (2018). Measuring self-regulation in self-paced open and distance learning environments. *International Review of Research in Open and Distributed Learning, 19*(1), 25–42. https://doi.org/10.19173/irrodl.v19i1.3255

Moore, M. (1989). Three types of interaction. *American Journal of Distance Education, 3*(2), 1–7. https://doi.org/10.1080/08923648909526659

Muijs, D. & Bokhove, C. (2020). Metacognition and self-regulation: Evidence review. London: Education Endowment Foundation. Available from: https://educationendowmentfoundation.org.uk/evidence-summaries/evidence-reviews/ metacognition-and-self-regulation-review/

National Center for Education Statistics: U.S. Department of Education, (2019). *Characteristics of Public and Private Elementary and Secondary Schools in the United States: Results From the 2017–18 National Teacher and Principal Survey First Look,* Table 3. https://files.eric.ed.gov/fulltext/ED597326.pdf

Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic analysis: Striving to meet the trustworthiness criteria. *International Journal of Qualitative Methods, 16*(1), 1–13. https://doi.org/10.1177/1609406917733847

Pintrich, P. R. (2004). A conceptual framework for assessing motivation and self-regulated learning in college students. *Educational Psychology Review, 16*(4), 385–407. https://doi.org/10.1007/s10648-004-0006-x

Pintrich, P. R., & DeGroot, E. V. (1990). Motivational and self-regulated learning components of classroom academic performance. *Journal of Educational Psychology, 82*(1), 33–40. https://doi.org/10.1037/0022-0663.82.1.33

Rivers, D. J., Nakamura, M., & Vallance, M. (2022). Online self-regulated learning and achievement in the era of change. *Journal of Educational Computing Research, 60*(1), 104–131. https://doi.org/10.1177/07356331211025108

Samruayruen, B., Enriquez, J., Natakuatoong, O., & Samruayruen, K. (2013). Self-regulated learning: A key of a successful learner in online learning environments in Thailand. *Journal of Educational Computing Research, 48*(1), 45–69. https://doi.org/10.2190/EC.48.1.c

Sinring, A., Aryani, F., & Umar, N. F. (2022). Examining the effect of self-regulation and psychological capital on the students' academic coping strategies during the COVID-19 pandemic. *International Journal of Instruction, 15*(2), 487–500. https://doi.org/10.29333/iji.2022.15227a

Sun, J. C. Y., & Rueda, R. (2012). Situational interest, computer self-efficacy and SR: Their impact on student engagement in distance education. *British Journal of Educational Technology, 43*(2), 191–204. https://doi.org/10.1111/J.1467-8535.2010.01157.X

Topping, K. J., Douglas, W., Robertson, D., & Ferguson, N. (2022). Effectiveness of online and blended learning from schools: A systematic review. R*eview of Education, 10*(2). https://doi.org/10.1002/REV3.3353

Tuckman, B. W. (2005). Relations of academic procrastination, rationalizations, and performance in a web course with deadlines. *Psychological Reports, 96*(3), 1015–1021. https://doi.org/10.2466/pr0.96.3.1015-1021

Türkben, T. (2019). The effect of self-regulation based strategic reading education on comprehension, motivation, and self-regulation skills. *International Journal of Progressive Education, 15*(4), 27–46. https://doi.org/10.29329/ijpe.2019.203.3

van Alten, D. C. D., Phielix, C., Janssen, J., & Kester, L. (2021). Secondary students' online self-regulated learning during flipped learning: A latent profile analysis. *Computers in Human Behavior, 118*, 1–13. https://doi.org/10.1016/j.chb.2020.106676

Wandler, J. B., & Imbriale, W. J. (2017). Promoting undergraduate student self-regulation in online learning environments. *Online Learning, 21*(2), 1–16. https://doi.org/10.24059/olj.v21i2.881

Wang, C.-H., Shannon, D. M., & Ross, M. E. (2013). Students' characteristics, self-regulated learning, technology self-efficacy, and course outcomes in online learning. *Distance Education, 34*(3), 302–323. https://doi.org/http://dx.doi.org/10.1080/01587919.2013.835779

Wood, E. A., Collins, S. L., Hechavarria, M., Foti, S., & Hack, G. (2022). The shortfalls of online learning catalyzed by COVID-19: Pre-health students' perspective. *Pedagogical Research, 2022*(3), 2468–4929. https://doi.org/10.29333/pr/12095

Zimmerman, B. J. (2008). Investigating self-regulation and motivation: Historical background, methodological developments, and future prospects. *American Educational Research Journal, 45*(1), 166–183. https://doi.org/10.3102/0002831207312909

Zimmerman, B. J. (2015). Self-regulated learning: Theories, measures, and outcomes. *International Encyclopedia of Social & Behavioral Sciences,* 541–546. https://doi.org/10.1016/B978-0-08-097086-8.26060-1

Zimmerman, B. J., & Risemberg, R. (1997). Self-regulatory dimensions of academic learning and motivation. In G. D. Phye (Ed.), *Handbook of academic learning: Construction of knowledge* (2nd ed.) (pp. 105–125). https://doi.org/10.1016/B978-012554255-5/50005-3