The correlation between Self-regulated Learning Behaviors and Academic Classification for HBCU Students Participating in Online and Remote Learning Experiences

Assistant Professor, Robert Cobb, Jr, PhD
Assistant Professor, Yu-Tung Kuo, PhD
Professor, Paula Faulkner, PhD
North Carolina Agricultural and Technical State University, NC, USA

Abstract

        The COVID-19 pandemic placed tremendous pressures on economic, medical, and educational infrastructures and systems around the world. Educational leaders were advised to "shutdown" schools which meant teachers and students were forbidden to gather in the same physical space to deliver and receive instruction. Pressures were transferred to technology leaders to create, maintain, and sustain technology infrastructure that depended on instructional technologies to mediate interactions among students, content, and instructors to provide learners with quality environments, experiences, and services while adhering to social distancing mandates. From a social cognitive perspective, this study is concerned with the relationship between abrupt environmental alteration created by the pandemic and the behavioral implications of deploying motivational and learning strategies empirically proven to contribute to academic success in traditional and online environments. The study showed undergraduate students at an HBCU participating in remote and online learning demonstrated slightly above average self-regulatory strategy use in environmental structuring (3.85), task strategy use (3.26), and time management (3.51). There is a statistically significant correlation between environmental structuring strategy use and academic classification; and a

statistically significant correlation between time management strategy use and academic classification. This study does bring attention to environmental conditions of students served by HBCUs; and the implications of these factors on learning behaviors they rely on in technology-mediated learning environments and experiences.

Keywords: Environmental structuring; Online learning; Self-regulated learning; Task strategy use; Time management, technology-mediated learning

1.   Introduction

The novel coronavirus, known as COVID-19, was discovered in December 2019 in Wuhan, China (WHO, 2020). In January 2020, the global cases increased to more than 9800 cases, and killing more than 200 people. The World Health Organization (WHO) declared Covid-19, a public health emergency of international concern on January 30, 2020. By March 2020, the WHO had confirmed more than 100,000 global cases of COVID-19 (Foresman, 2020). Due to the COVID-19's characteristics of high-rapid transmission among people and high deadly rates, WHO announced Covid-19 as a pandemic on March 11, 2020, and stated emergency measures (such as social distancing) to control the severe spread of the pandemic (WHO, 2020). National authorities responded to this pandemic by implementing travel bans, lockdowns, and facility closures. COVID-19 had catastrophic implications on major infrastructures globally, including, but not limited to, healthcare, economic, societal, and educational. Academic institutions, including public and private preschools, elementary schools, high schools, and universities worldwide, have been closed (fully, partially), affecting approximately 98.5 percent of the world's student population (UNESCO, 2020).

The first confirmed case in the United States (U.S.) was discovered in the state of Washington. By March 2020, U. S. health officials confirmed more than 1,200 cases of COVID-19 across 44 states and Washington, D.C. The University of Washington, Michigan State University, and Arizona State University confirmed individuals on these respective campuses had been diagnosed with the virus. As of March 13, 2020, over 300 colleges and universities announced remote instruction would replace in-person classes to control the spread of the virus. To continue to provide academic services to students, universities have since been using online learning management systems, video conferencing tools, and messaging platforms to assure students can access course materials and communicate with course materials and instructors (Foresman, 2020).

Due to the threat of COVID-19, colleges and universities faced decisions about how to continue teaching and learning while keeping faculty, staff, and students safe. As a result, most institutions opted to cancel all face-to-face classes, including labs and other learning experiences, mandating that faculty move courses online to help prevent the spread of COVID-19 (Hodges et al., 2020) Remote teaching was ideal in most cases due to allowing instructors to deliver lessons online, while students completed assignments, projects, and assessments just like they would in face-to-face classes (Faulkner, Cobb, Ibrahim & Zimmerman). The "pivot" educational institutions made in the spring 2020 semester were done so without a blueprint to define best practices as administrators, faculty, staff, and students tried to organize, teach, learning and maintain in a novel environment created by the novel coronavirus. Although it has emerged as a growing topic of discussion (Fisher, 2020), very little is known about the effects of COVID-19 on higher education (Chan, 2020), especially for those students served by historically black colleges and universities (HBCU). This abrupt change in the [learning] environment caused learners to rely on behaviors and strategies that many had not yet developed and had not been tested to build efficacy in their attribution to academic success in the now "novel" learning environments and experiences created by the novel coronavirus.

1.1.   Self-regulated learning

According to Zimmerman (1989), "self–regulated learning (SRL) is one's ability to be metacognitively, motivationally, and behaviorally active in one's learning process" (p. 329). Metacognitively, the self-regulated student plans, organizes, self-instructs, self-monitors, and self-evaluates at various stages during the learning process. Motivationally, these students view themselves as competent, self-efficacious, autonomous, and perceive their efforts and outcomes as valuable and worthwhile. Behaviorally, they select strategies, structure learning, and create learning environments to optimize learning.

From a social cognitive perspective, self-regulating learning (SRL) processes fall into three cyclical phases: forethought, performance, and self-reflection. The social-cognitive perspective holds that successful self-regulated learners possess higher motivation levels, apply more effective learning strategies, and respond more appropriately to situational demands (Pintrich & Schunk, 2002). The important elements of self-regulated learning are learning strategies, self-efficacy, and commitment to achieve academic goals. Self-regulated learning is defined by a set of learning strategies that students undertake to learn (Pintrich, 2004; Zimmerman, 2000, 2008). Self-efficacy refers to one's confidence in one's skills to perform a task; and the

self-appraisal that the learning and motivational strategies used can be attributed to one's ability to master a given task (Pintrich et al., 1991).

Within the agentic framework of social cognitive theory, self-regulation operates through three generic subfunctions: self-monitoring, adaptation of proximal goals, and exercise of self-influences (Bandura, 1986). The performance phase of self-regulated learning involves two major processes: self-control and self-observation. Self-control refers to students focusing on and managing distractions. According to Zimmerman and Moylan (2009), environmental structuring, task management, and task strategies are among the self-control strategies. Some significant studies have found significant correlations between academic outcomes and overall SRL (Cicchinelli et al., 2018; Pardo et al., 2016) or time management constructs (Bruso & Stefaniak, 2016; Dunnigan, 2018). Jon-Choa et al (2021) revealed that participants demonstrating high levels of SROL components, including time management, environmental structuring, and task strategy use, were more positive about the effectiveness of their learning. What can set high performing students apart from low performers is their awareness of SRL and the use of these strategies in their learning process (Zimmerman, 2013). Vilkova (2019) reported that SRL forethought phase, one of the three cyclical phases of SRL, was a significant predictor of success in Massive Open Online Courses (MOOCs).

1.2.   Self-regulation and online learning

Social cognitive models emphasize the influence of social and environmental factors on students' personal beliefs, associated behaviors, and academic success in online education (Pintrich, 2000; Richardson & Swan, 2003; Zimmerman, 2000). Learners must access online courses independently and structure time, pace, and strategy of their own learning processes. Due to the lack of direct interaction between the learner and instructor and reduced active role of the teacher, it has been hypothesized and suggested that the necessity of self-regulation may be more important in distance learning environments moreso than in "traditional" learning environments (King, Harner, & Brown, 2000; Jonassen et al., 1995).

Online learning systems are perceived as a valuable teaching platform on which students who engage in their online learning work using SRL strategies are inclined to achieve higher grades than their counterparts who do not do online learning (Fan et al., 2017; Magalhaes et al., 2020). Self-regulatory concepts and strategies such as self-efficacy, effort regulation, and peer learning correlate with student retention in distance education programs (Peck, Stefaniak, & Shah, 2018). Greene, Bolick, and Robertson (2010) found compared with less experienced learners that skillful self-regulated learners more frequently enact strategies during online

learning. Yukselturk and Bulut (2007) described high performing students in online learning contexts as those who were capable of: 1) recognizing their responsibilities, 2) regularly revising study materials, 3) completing tasks on time, 4) reflecting on their own learning process, and 5) participating in online forums. On the contrary, they found that low performing students in online learning contexts: 1) did not maintain their initial motivation throughout the learning process, 2) did not dedicate enough time to completing all the tasks, and 3) did not make enough study effort.

Learning in Massive Open Online Courses (MOOCs) fosters learning dynamics in which motivational variables and students' capacity for self-regulation play a significant role (Durksen et al., 2016; Littlejohn et al., 2016). Reparaz, et al. (2020) found that completer students participating in MOOCs were more capable of self-regulating their learning and showed significantly higher levels of perceived effectiveness and engagement with MOOC content than non-completers. Handoko et al. (2019) stated that qualitative content analysis of the open-ended responses submitted by MOOC Completers also identified five key SRL subprocesses of task interest/value, causal attribution, time management, self-efficacy, and goal orientation. It was found that MOOC completers often applied multiple SRL subprocesses to improve their learning experience in the MOOC environment. Students demonstrated several significant adaptations of SRL strategies unique to web-based environments, including better use of time and environment management (Hsu et al., 2009; Igo et al., 2005; Puzziferro, 2008; Whip & Chiarelli, 2004).

2.   Methods

Learning environments comprise of three essential components: learners, instructional content and materials, and instructor(s). In traditional (face-to-face) learning environments, the interactions between these environmental components are bi-directional, immediate, and direct (Figure I).
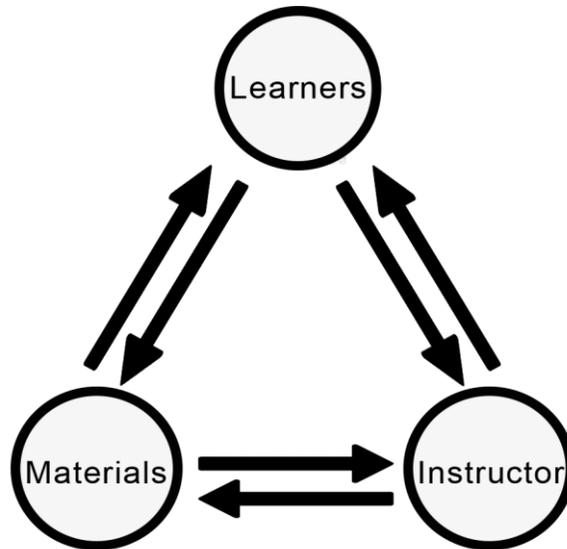
Figure 1. Interactions between environmental components in "face-to-face" learning environments

In response to the COVID-19 pandemic, higher education institutions required [most] students to migrate away from the physical campus community to reduce the virus's spread. Instructors integrated digital educational platforms (such as Blackboard and Canvas) along with other communication platforms (such as Zoom, Skype, Google Hangout, etc.) to facilitate interactions and deliver instruction via the Internet (Fry, 2001). The students being removed from the physical campus disrupted access to resources, including but not limited to technological resources such as computers and internet access, that may be more reliable on campus than those resources they may (or may not) have access to at home. Students attending Historically Black Colleges and Universities (HBCUs) were removed from the "academic, emotional, and social scaffolding that many first-generation students who attend a Historically Black College and University (HBCU) need to prepare for the rigors of college" (Waker, 2015). Since March 2020, the intimate, direct, immediate "connection" offered by the traditional, face-to-face learning environment between learners, instructional content and materials, and instructors has "severed." These "connections" have been rerouted and facilitated through networked desktop/mobile devices (Figure II).
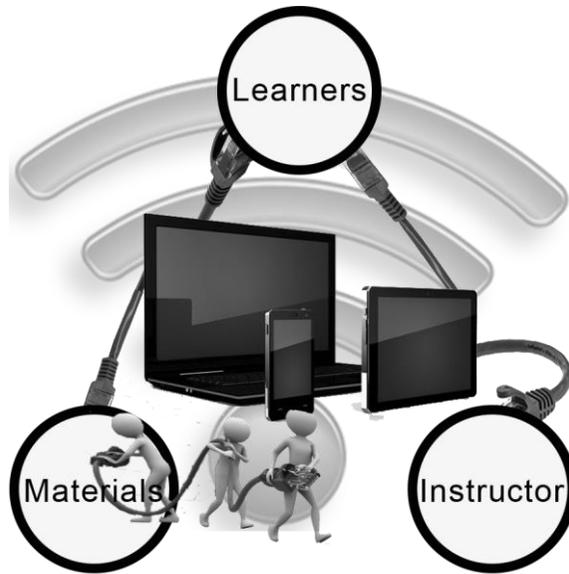
Figure 2. Interactions between environmental components in online learning environments

Learners engage with their classmates, instructional materials, content, and instructors asynchronously at any place using a learning management system (LMS) such as Blackboard, Moodle, or Canvas. Real-time interactions occur between environmental components using synchronous technologies such as Zoom, Blackboard Collaborate Ultra, Microsoft Teams, or Google Meets. The social cognitive theory posits an interdependent, bidirectional, and reciprocal relationship between environmental factors, behavioral factors, and personal factors. Triadic reciprocal determinism (TRD) is often utilized as a conceptual and analytical model in studies using social cognitive theory (SCT) as a theoretical framework, representing bidirectional relationships among an individual's behavior, personal factors, and the environment (see Figure III).
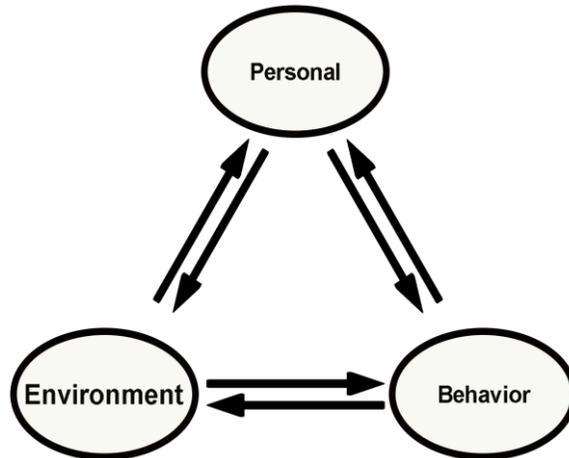
Figure 3. Social Cognitive Theory (Bandura, 1986)

TRD describes how a person regulates relative to changing environmental circumstances to gain desired outcomes (Bandura, 1986). Students face unexpected interruption while learning online due to distractors in their home and online (Rajab, Gazal, & Alkattan, 2020). The interdependent relationship among the personal, environmental, and behavioral factors would suggest that a change in any one of the factors would impact the other two factors. This unexpected change of instructional and learning modes has revealed many educational issues. For examples, the unavailability of face-to-face relationships among learners, learners, and instructors has resulted in not only the decrease in instructional achievement and student engagement (Garcia & Weiss, 2020; Joshi et al., 2020) but also the increase of young adults with symptoms of anxiety and/or depressive disorder (Czeisler et al., 2020; Wang et al., 2020).

This study investigates the implications the abrupt change from face-to-face instruction to remote or online instruction affected the motivational and learning behaviors (i. e., self-regulated learning strategies) students deployed to complete learning task and accomplish learning goals in online environments amid the COVID-19 pandemic. Older students used more advanced strategies to monitor their own learning behaviors and used them more frequently than younger students (Lan, 2005). Morris, Hotchkiss, and Swinnerton (2015) identified that learners' age, prior online learning experience, educational attainment, and job status predicted their learning outcomes. However, Yukselturk and Bulut (2007) reported no relationship between students' general demographic information, such as age and gender, and their success in online courses. Law, Chan, and Sachs (2008) did not find significant different SRL strategy usage between students of different ages. The inquires of this study focused on three behaviors and the

correlation of these behaviors with the academic classification of the learners. The objectives developed to guide this study included:

1. Is there a significant correlation between environmental structuring and academic classification?
2. Is there a significant correlation between task strategy use and academic classification?
3. Is there a significant correlation between time management and academic classification?

To determine the correlation between the self-regulated behaviors reported by the participants and their academic classification, the researchers used the Kendall's tau-b correlation coefficient (Kendall's tau-b). Kendall's tau-b (tb) is a nonparametric measure of the strength of association that exists between two variables measures on at least one ordinal scale. Kendall's tau-b was used to address the reduction in the sample sizes to analyze if a correlation exists between the behaviors and the four academic classifications (i. e., freshman, sophomore, junior, and senior). When using the Kendall's tau-b, the data must pass the following assumptions: 1) the two variables are measured on an ordinal or continuous scale and 2) the data is to follow a monotonic relationship. A monotonic relationship is where the size of one variable increases while the other variable increases, or the size of one variable increases while the other variable decreases.

2.1.   Participants

The participants in this study included 138 undergraduate students attending a Historically Black College and University (HBCU) in the southeastern region of the U.S. There were 88 females (63.8%), 49 males (35.5%), and one participant who preferred not to identify by gender. Most of the participants are Black or African American (87.7%). Most identified as freshman (40.6%) and sophomore students (28.3%). The percentages of junior and senior students were 18.8 percent and 12.3 percent, respectively (see Table I).

Table 1. Demographics

		Frequency	Percent
Gender	Female	88	63.8
	Male	49	35.5
	I prefer not to self-identify	1	.7
	Total	138	100.0
Race	American Indian or Alaska Native	4	2.9
	Asian	2	1.4
	Black or African American	121	87.7
	Hispanic or Latino	3	2.2

	White	5	3.6
	Other	3	2.2
	Total	138	100.0
Academic Classification	Freshman	56	40.6
	Sophomore	39	28.3
	Junior	26	18.8
	Senior	17	12.3
	Total	138	100.0
Majors	Agriculture	10	7.2
	Arts and Humanities	19	13.8
	Business	10	7.2
	Education	7	5.1
	Engineering	16	11.6
	Human Sciences	35	25.4
	Science and Technology	34	24.6
	Undeclared	7	5.1
	Total	138	100.0
GPA	4.00 - 3.31	51	37.0
	3.30 - 2.31	67	48.6
	2.30 - 1.31	16	11.6
	1.30 - 0.31	4	2.9
	Total	138	100.0

The participants reported pursuing undergraduate degrees from a variety of disciplines, including health and human sciences (25.4%), science and technology (24.6%), arts and humanities (13.8%), engineering (11.6%), agriculture (7.2%), business (7.2%), and education (5.1%). There were also participants (5.1%) who reported their major as undeclared. Most (48%) of the students' GPAs are in the range of 2.31 and 3.30. Thirty-seven percent of the students' GPAs range between 3.31 and 4.00.

2.2.   Data collection

Due to classes being moved to remote or online learning platforms, the researchers used Qualtrics to provide participants access to the survey instrument. The researchers provided directors and administrators of student success divisions at the institution Uniform Resource Locator (URL) to the instrument. The directors and administrators emailed the research study's description and the link to the instrument to the undergraduate students in their respective units. Students were informed about the purpose of the study and their participation was voluntary. Data was collected over a 10-week period with two reminder messages encouraging students to complete the survey. Institutional Review Board (IRB) guidelines were followed in the data collection process.

2.2.1. Demographic survey

The demographics section of the survey requested students to report a) race/ethnicity, b) gender, c) academic classification, d) GPA, e) credit hours enrolled during the semester, f) hours worked per week, g) college affiliation, and h) department affiliation.

2.2.2. Online self-regulated learning questionnaire (OSLQ)

The Online Self-Regulated Learning Questionnaire (OSLQ) was developed on the premise that self-regulation is a context-specific process (Zimmerman, 1998). The original OSLQ comprises of 24 items. Each item of the OSLQ is categorized under one of six subscale constructs: 1) environmental structuring, 2) goal setting, 3) time management, 4) help-seeking, 5) task strategies, and 6) self-evaluation. The response items were based on a five-point Likert scale ranging from 1= strongly disagree to 5=strongly agree.
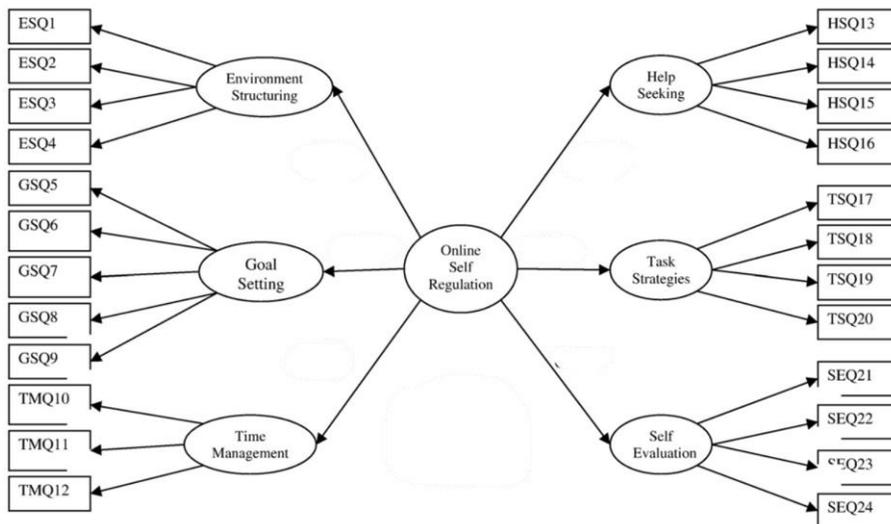
Figure 4. Subscales and items in the OSLQ (Barnard et al., 2009).
Permission was obtained to use

While creating the OSLQ, Barnard et al. (2009) studied the psychometric properties across students experiencing blended, or hybrid course delivery format and courses delivered totally online. The study indicated evidence toward the construct validity of the OSLQ with respect to students in a blended course format and concerning students enrolled in online course format (Barnard et al., 2009; Chang et al., 2015). The OSLQ subscales have high internal consistency. The Cronbach's alpha values for the subscales for the OSLQ were environmental structuring (a = .90), time management (a = .78), and task strategies (a = .67) for students in blended or

hybrid course format. For online course format, the Cronbach's alpha values for the subscales for the OSLQ were environmental structuring (a = .92), time management (a = .87), and task strategies (a = .93). Nunnally (1978) has suggested that a reliability score of .70 or better is acceptable when used in basic social science research.

Participants in the current study responded to 23 items. There were eight demographic items, eleven items from the Online Self-Regulated Learning Strategies Questionnaire (OSLQ), and four open-ended questions. The participants self-reported the self-regulated learning behaviors they demonstrated in the online environment using 11 items associated with three subscale constructs on the OSLQ: 1) environmental structuring, 2) time management, and 3) task strategies use. Responses to items associated with the OSLQ were based on a five-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree.

2.2.3. Qualitative data

The participants were asked to respond to four open-ended items to elaborate on a) positive online learning experiences, b) challenges of participating in online course, c) how being home contributed to positive online learning experience, and d) how home contributed to challenges during online learning experience.

3.   Results
3.1.   Preliminary analyses

The participants self-reported the self-regulated learning behaviors they demonstrated in the online environment. The participants' average scores of environmental structuring, task strategy use, and time management are respectively 3.85 (SD= 0.81), 3.26 (SD= 0.85), and 3.51 (SD= 0.92) (See Table II) The performance phase of self-regulated learning involves two major processes: self-control and self-observation. Self-control refers to students focusing on and managing distractions. According to Zimmerman and Moylan (2009), environmental structuring, task management, and task strategies are among the eight self-control strategies associated with self-regulated learning.

Table 2. Descriptive statistics for Environmental Structuring, Task Strategy Use, and Time Management

	Min	Max	Mean	Std. Dev.
Environmental Structuring	1.00	5.00	3.8496	.81363
Task Strategy Use	1.00	5.00	3.2554	.85300
Time Management	1.00	5.00	3.5097	.92210

3.2.   Kendall's tau-b correlations

To determine the correlation between the self-regulated behaviors reported by the participants and their academic classification, the researchers used the Kendall's tau-b correlation coefficient (Kendall's tau-b). Kendall's tau-b (tb) is a nonparametric measure of the strength of association that exists between two variables measures on at least one ordinal scale. Kendall's tau-b was used to address the reduction in the sample sizes among the correlations between the behaviors and the four academic classifications (i. e., freshman, sophomore, junior, and senior). When using the Kendall's tau-b, the data must pass the following assumptions: 1) the two variables are measured on an ordinal or continuous scale and 2) the data is to follow a monotonic relationship. A monotonic relationship is where the size of one variable increases while the other variable increases, or the size of one variable increases while the other variable decreases.

3.2.1.   Environmental structuring and academic classification

To determine if there was a significant correlation between students' structuring their learning environment and academic classification, Kendall's tau-b correlation was utilized. Table III confirms a weak positive association between environmental structuring and academic classification, which was statistically significant ($\tau b = 0.179$, p = 0.008).

Table 3
Kendall's tau-b correlation between environmental structuring and academic classification

			Academic Classification	Environmental Structuring
Kendall's tau-b	Academic Classification	Correlation Coefficient	1.000	.179**
		Sig. (2-tailed)	.	.008
		N	138	138
	Environmental Structuring	Correlation Coefficient	.179**	1.000
		Sig. (2-tailed)	.008	.
		N	138	138

**. Correlation is significant at the 0.01 level (2-tailed).

3.2.2.   Task strategy use and academic classification

A Kendall's tab-b correlation was used to determine if there was a significant correlation between students' task strategy use and academic classification. Table IV indicates a weak positive association between task strategy use and academic classification, which was statistically insignificant ($\tau b = 0.154$, p = 0.096).

Table 4

Kendall's tau-b correlation between task strategy use and academic classification

			Academic Classification	Task Strategy Use
Kendall's tau_b	Academic Classification	Correlation Coefficient	1.000	.096
		Sig. (2-tailed)	.	.154
		N	138	138
	Task Strategy Use	Correlation Coefficient	.096	1.000
		Sig. (2-tailed)	.154	.
		N	138	138

3.2.3. Time management and academic classification

To determine if there is a significant correlation between students' time management and the students' academic classification, Kendall's tau-b correlation was utilized. Table 5 indicates a weak positive association between time management and academic classification, which was statistically significant ($\tau b = 0.153$, $p = 0.024$.

Table 5

Kendall's tau-b correlation between time management and academic classification

			Academic Classification	Time Management
Kendall's tau_b	Academic Classification	Correlation Coefficient	1.000	.153[*]
		Sig. (2-tailed)	.	.024
		N	138	138
	Time Management	Correlation Coefficient	.153[*]	1.000
		Sig. (2-tailed)	.024	.
		N	138	138

*. Correlation is significant at the 0.05 level (2-tailed).

This study reveals that the correlations between environmental structuring and the students' academic classification and the correlation between time management and the students' academic classification were significant. The correlation between environmental structuring and academic classification was significant at $p = .01$ (see Table 3). The correlation between time management and academic classification was significant at $p = .05$ (see Table 5). The students participating in this study were all

undergraduate students. It is hypothesized that students in the higher academic classifications demonstrated these self-regulated learning behaviors more than the students in the lower academic classifications. This finding corroborates work done by Greene, Bolick, & Robertson (2010), which reported in comparison with less experienced learners; skillful self-regulated learners more frequently enact strategies during online learning. The weak associations between the SRL behaviors (i. e., environmental structuring, task strategy use, time management) and academic classification presented in Tables 3, 4, and 5 may be a result of the small sample sizes of freshman (56), sophomore (39), juniors (26), and seniors (17) included in the correlations (see Table 1).

4.   Discussions

The mean scores for the participants, who were primarily Black or African American, are slightly above Level 3 (out of 5 levels) in their reporting of self-regulated learning behaviors pertaining to environmental structuring, task strategy use, and time management in online learning environments. Higher scores on the OSLQ (Level 4 or 5) indicate better self-regulation in students' online learning (Barnard et al., 2009). These findings are concerning as average or medium SRL level is correlated with self-handicapping techniques such as disengagement, procrastination, and 'gaming the system' which are considered negative SRL behaviors (Winne, 2015). Versteg et al. (2019) highlights medium self-regulated learners are clearly engaging in 'gaming the system' significantly more than low and high self-regulated learners. Bruso and Stefaniak (2016) found that among the six components of the OSLQ, environmental structuring (and goal setting) was utilized most frequently by study participants, and environmental structuring was impacted by gender, age, and campus location. The time management subscale was impacted by campus location. Prior research has indicated that students who take online courses struggle to employ self-regulated learning strategies to support their learning goals (Azevedo, 2005; Barnard, Paton, & Lan, 2008; Cho, 2004; Hu & Gramling, 2009; van Den Hurk, 2006).

4.1.   Environmental conditions of students served by HBCUs

HBCUs enroll and educate more Black students from underserved backgrounds when compared to other post-secondary institutions (White, 2016). Fifty-two percent of students attending HBCUs are first-generation college students, and 71 percent of HBCU students are Pell Grant Awardees (The National Postsecondary Student Aid Study data indicates that HBCU students typically come from much lower-income families than do students at non-HBCUs. The parental income of black students attending HBCUs is

approximately \$42,000. Parental income of Black students is almost 40 percent higher (approximately \$59,000) at other schools than it is at HBCUs. The gap for non-Black students at HBCUs and non-HBCUs is approximately \$68,000 and \$105,000, respectively (Startz, 2021).

Roy, McCoy, and Raver (2014) found that children who experienced a move into poverty during early to middle childhood had lower teacher-reported self-regulation worse executive functioning. Van der Veen and Peetsma (2009) stated, "explanations for the decline in self-regulated learning behavior that apply specifically to students in the lowest academic level of secondary school can be derived from the context they grow up in." Students of low SES backgrounds often lack the self-regulatory habits and metacognitive strategies to improve academic performance. They exhibit low task persistence, poor study skills, and now engage in reflection related to performance (Jensen, 2009). This finding suggests considering that when these students transition from high school to college, the demonstration of necessary SRL strategies that have been found to yield academic success in college may be lacking in some students from socioeconomically disadvantaged backgrounds.

4.2.   Self-regulated learning interventions

In this study, the SRL behaviors reported by students attending an HBCU where 87.7 percent of the participants were Black or African American undergraduate students participating in online courses were at an average level of SRL strategy use (Level 3) signals children from low-income families may benefit from explicit instruction in SRL strategies (Nisbett, 2007). Research shows that a lack of self-regulation is a significant factor that could influence online learning experience and academic outcomes (Oh & Reeves, 2013; YukselVan der Beek, Bellhäuser). Cleary (2018) contended that encouraging students to think in the language of strategy is a key aspect of SRL instruction, proposed time management, and environment structuring, along with six other SRL strategies. Karlen & Hertel (2020) conducted a randomized intervention study with two different treatments, and results showed that a web-based course could foster self-regulated learning as effectively as an attendance-based course; and that the students in the two courses made equal gains in SRL strategies.

Bruso & Stafanski (2016) encouraged exploring the types of self-regulated learning strategies that students in distance learning environments are employing. There are indications that students' self-awareness of self-regulation strategies is key to the refinement of techniques and the development of systematic means to ensure deployment of strategies as the need arises (Byman & Kansanen, 2008; McCann and Turner, 2004). Understanding the learner propensities related to self-regulated learning

allows educators to assess their presence and devise ways to teach self-regulation strategies (Zimmerman, 1998) more effectively. The findings of Verstege et al. (2019) suggests the existence of intermediate SRL level are characterized by an increase in perceived agency, ownership over the learning process and use of strategies and resources, but still lacking goal-directed activity and appropriate planning and execution to meet the goals. The medium SRL level seems to be a developing but not yet mature SRL level. The random and detrimental to learning behavior of this group, indicates that special attention should be paid in SRL interventions to this group, and to support students to move to a higher SRL level. If online teachers and course designers wish to ensure effective online learning delivery, they must understand the student's perceptions of effective or ineffective online courses (Jon-Choa, Yi-Fang, & Jian-Hong, 2021).

4.3. Implications of SRL intervention for HBCU online learners

Historically Black Colleges and Universities enroll and educate more Black students from underserved backgrounds versus other post-secondary institutions. Moreover, they consistently seek to give second chances to students at the margins of society" (Walker, 2015). Andrzejewski et al. (2016) made explicit connections to Bourdieu's theory of cultural capital and argued self-regulated learning strategies are a type of internalized habitus that can be developed in academic settings. "Future research needs to investigate how various SRL interventions within different socio-cultural contexts across diverse disciplines influence students' self-regulation and academic performance" (Yang & Kortecamp, 2020, p. 38). This research will be beneficial to and inclusive of the demographic of students that HBCUs serve.

This current study's methods may be used to collect and analyze SRL baseline data provided by Black or African American undergraduate students attending HBCUs that are participating in online courses. The findings may inform the design of instructional materials and professional development of faculty to embed SRL interventions within the content and pedagogy of the online learning experience and environment (Cobb, 2020). Further research is warranted to investigate the implications of self-regulated learning interventions in online learning environments in which Black or African American undergraduate students participate; and the level at which they deploy SRL behaviors to accomplish learning goals and complete learning tasks. In online learning, SRL plays an essential role in assessing student learning effectiveness so that institutions and instructors can provide efficient support. Facing the coronavirus lockdown, students attending HBCUs need to adapt to the learning settings and engage in SRL phases and processes to yield positive learning gains in online learning contexts. To

develop the self-efficacy in the development and implementation of these strategies, they must be made aware, develop, and implement these motivational and learning strategies in an online context. Then, they can attribute academic gains and success because of their implementation.

Conclusion

During the pandemic, some undergraduate students attending HBCUs returned home from campuses across the United States and worldwide to environmental conditions that may have had a myriad of distractions and not optimal for learning. Students may have had to care for younger siblings in a family where the parents were essential workers. Due to the pandemic's economic impact, students who returned home may have had to seek employment to contribute to the financial obligations of the home while still participating in courses remotely or online to continue matriculation toward degree completion. Parents cannot provide their children or family enough financial support, which leads to tuition debt and poor nutrition (DePietro, 2021; Jamerson, Josh, & Joshua, 2020; Van Lancker, & Parolin, 2020). The COVID-19 pandemic has had a devastating effect on students who live in rural and poor communities (Berry 2020), making educational and socioeconomic disparities abundantly clear. The negative implications were intensified and potentially traumatic for some students served by HBCUs.

Proponents of distance education, online learning, and computer-based tools for learning have dominated much of the dialogue around these modes of education and learning in adult education journals, for example, suggesting means to foster cultural inclusivity (Chang, 2004; Ziegahn, 2005), reducing barriers to technology integration amongst adult basic educators (Kotrlik & Redmann, 2005). There are opponents to cyber-education that view online learning as a mechanism of symbolic violence because it provides the false perception (or creates misrecognition) of increasing access and equality while maintaining inequalities. Symbolic violence refers to a kind of violence, oppression, or coercion that is not physical; instead, symbolic violence is "a gentle, invisible violence, unrecognized as such" (Bourdieu, 1990, p. 127). This may be especially true for students attending an HBCU being "forced" to participate in online instruction.

The environmental conditions some HBCU students returned to because of COVID-19 may not have adequately nurtured the development of SRL behaviors necessary to achieve academic success throughout their academic experiences prior to entering college. The negative implications are compounded when the only options to learn were limited to remotely or online. Even if students had technological resources (e. g., computers, mobile devices, and internet connectivity), they often lacked the environmental resources necessary to develop, demonstrate, test, and

evaluate the SRL behaviors needed to complete learning tasks and accomplish learning goals in these "novel" environments making the educational experiences pedagogically unattainable. These compounding environmental factors preying on the possible deficiencies of SRL strategy development of ethnic minorities and those of low SES perpetuates the notion of computer mediated instruction (e. g., online learning) as a symbolically violent phenomenon.

Martin (2004) pointed out that psychologists who conduct self-studies, such as self-regulation, construct models and offer recommendations that are seemingly intended to apply across social classifications and realities without representation by all social classes. Bullock and Limbert (2009) noted that SES tends to remain invisible in psychological research. Murdock (2000) also noted that little had been done to further our understanding of how learning occurs within macro-level contexts such as social class. This study responds to the call for the next generation of SRL research to focus on socio-political context (Boekearts & Corno, 2005) as the paucity of SRL and online learning research excludes, or does not intentionally include or acknowledge, learner's with the characteristics of those served by historically black colleges and universities.

This study considers the compounding environmental factors such as the abrupt change from face-to-face to online learning along with the socioeconomic considerations and. It considers the implications of these environmental factors on the students' motivational and learning strategies while participating in the remote and online learning environments while experiencing a global pandemic. The result of this study encourages the need for administrators, student support services, and faculty at HBCUs to invest in initiatives such as self-regulated learning interventions and self-regulated learning strategy instruction. The initiative will inform the professional development of faculty and staff; design and development of develop the skills and knowledge of HOW their students learn.

References:

1. Andrzejewski, C. E., Davis, H. A., Bruening, P. S., & Poirier, R. R. (2016). Can a self-regulated strategy intervention close the achievement gap? Exploring a classroom-based intervention in 9th grade earth science. Learning and Individual Differences, 49, 85 – 99.
2. Azevedo, R. (2005). Using hypermedia as a metacognitive tool for enhancing student learning? The role of self-regulated learning. Educational Psychologist, 40, 199–209.
3. Bandura, A. (1986). Social foundations of thought and action: A social cognitive theory. Englewood Cliffs, NJ: Prentice-Hall, Inc.

4. Barnard, L., Lan, W. Y., To, Y. M., Paton, V. O., & Shu-Ling, L. (2009). Measuring self-regulation in online and blended learning environments. Internet and Higher Education, 12, 1-16.

5. Barnard, L., Paton, V., & Lan, W. (2008). Online self-regulatory learning behaviors as mediator in the relationship between online course perceptions with achievement. International Review of Research in Open and Distance Learning, 9(2), 1–11.

6. Berry, B. (2020). Teaching, learning, and caring in the post-COVID era. Phi Delta Kappan, 102(1), 14–17. https://doi.org/10.1177/0031721720956840

7. Bourdieu, P. (1990). The logic of practice (R. Nice, Trans.). Stanford: Stanford University Press.

8. Binyu, Y. & Kortecamp, K. (2020). Interventions to enhance postsecondary students' self-regulation in online contexts: A review of the literature 2000–2020. The Quarterly Review of Distance Education, 21(1), 23–43.

9. Blumenthal, D., Fowler, E. J., Abrams, M., & Collins, S. R. (2020). Covid-19—implications for the health care system. https://www.nejm.org/doi/full/10.1056/nejmsb2021088.

10. Bruso, J. L. & Stefaniak, J. E. (2016). The use of self-regulated learning measuring questionnaires as a predictor of academic success. TechTrends, 60, 577 – 584.

11. Buckner, M. M., & Strawser, M. G. (2016). "Me"millennials and the paralysis of choice: Reigniting the purpose of higher education. Communication Education, 65(3), 361–63.

12. Bullock, H. E. & Limbert, W. M. (2009). Class. In D. Fox, I. Prilletensky, & S. Austin (Eds.) Critical Psychology: An Introduction, (2nd ed.,pp. 237-259). Los Angeles: SAGE.

13. Byman, R., & Kansanen, P. (2008). Pedagogical thinking in a student's mind: a conceptual clarification on the basis of self-determination and volition theories. Scandinavian Journal of Educational Research, 52 (6), 603–621.

14. Chan, Roy Y. (2020). Studying Coronavirus (COVID-19) and Global Higher Education: Evidence for Future Research and Practice. Unpublished Paper.

15. Chang, H., Wang, C., Lee, M., Wu, H., Liang, J., Lee, S. W., Chiou, G., Lo, H., Lin, J., Hsu, C., Wu, Y., Chen, S., Hwang, F., & Tsai, C. (2015). A review of features of technology-supported learning environments based on participants' perceptions. Computers in Human Behavior, 53(1), 223–237. https://doi.org/10.1016/j.chb.2015.06.042

16. Chang, W. W. (2004). A cross-cultural case study of a multinational training program in the United States and Taiwan. Adult Education Quarterly, 54(3), 174-192.

17. Cho, M. H. (2004). The effects of design strategies for promoting students' self- regulated learning skills on students' self-regulation and achievements in online learning environments. Association for Educational Communications and Technology, 27(1), 19–23.

18. Cleary, T. J. (2018). The self-regulated learning guide: Teaching students to think in the language of strategies. Routledge.

19. Cobb Jr., R. (2020). Developing self-regulated learning behaviors in online learning environments: A conceptual framework for inclusion. Journal of Research Initiatives, 5(2), 1 – 17. https://digitalcommons.uncfsu.edu/jri/vol5/iss2/5

20. Czeisler, M. É., Lane, R. I., Petrosky, E., Wiley, J. F., Christensen, A., Njai, R., ... & Rajaratnam, S. M. (2020). Mental health, substance use, and suicidal ideation during the COVID-19 pandemic—United States, June 24–30, 2020. Morbidity and Mortality Weekly Report, 69(32), 1049.

21. DePietro, A. (2021, February 17). Impact of Coronavirus (COVID-19) on college tuition and finances. https://www.forbes.com/sites/andrewdepietro/2020/06/02/impact-covid-19-tuition-finance/?sh=4dd9bfc24b88.

22. Dunnigan, J. E. (2018). The relationship of self-regulated learning and academic risk factors to academic performance in community college online mathematics courses. Doctoral dissertation Seattle Pacific University.

23. Durksen, T. L., Chu, M. W., Ahmad, Z. F., Radil, A. I., & Daniels, L. M. (2016). Motivation in a MOOC: A probabilistic analysis of online learners' basic psychological needs. Social Psychology of Education, 19(2), 241–260. https://doi.org/10.1007/s11218- 015-9331-9.

24. Fan, H., Xu, J., Cai, Z., He, J., & Fan, X. (2017). Homework and students' achievement in math and science: A 30-year meta-analysis, 1986–2015. Educational Research Review, 20, 35–54. https://doi.org/10.1016/j.edurev.2016.11.003.

25. Faulkner, P.E., Cobb, R., Ibrahim, S., & Zimmerman, T. (2020). Survival teaching tips for remote teaching laboratories during COVID-19! NACTA Journal.

26. Fischer, K. (2020). Confronting the Seismic Impact of COVID-19: The Need For Research. Journal of International Students, 10(2), i-ii. https://doi.org/10.32674/jis.v10i2.2134.

27. Foresman, B. (2020, March 24). Here are the U.S. universities that have closed due to coronavirus. https://edscoop.com/universities-closed-due-coronavirus-2020/.

28. Fry, K. (2001). E-learning markets and providers: Some issues and prospects. Education+ Training, 43(4/5), 233–239.

29. Greene, J. A., Bolick, C. M., & Robertson, J. (2010). Fostering historical knowledge and thinking skills using hypermedia learning environments: The role of self-regulated learning. Computers & Education, 54(1), 230–243.

30. Handoko, E., Gronseth, S. L., McNeil, S. G., Bonk, C. J., & Robin, B. R. (2019). Goal setting and MOOC completion: a study on the role of self-regulated learning in student performance in massive open online courses. International Review of Research in Open and Distributed Learning, 20 (3), 39-58.

31. Hodges, C., Moore, S., Lockee, B., Trust, T., & Bond, A. (2020). The difference between emergency remote teaching and online learning. https://er.educause.edu/articles/2020/3/the-difference-between-emergency-remote-teaching-and-online-learning

32. Hsu, Y. C., Ching, Y. H., Mathews, J. P., & Carr-Chellman, A. (2009). Undergraduate students' self-regulated learning experience in web-based learning environment. Quarterly Review of Distance Education, 10(2), 109–121.

33. Igo, L., Bruning, R., & McCrudden, M. (2005). Encoding disruption associated with copy and paste note-taking. In L. PytlikZillig, M. Bodvarsson, & R. Bruning (Eds.), Technology-based education: Bringing researchers and practitioners together (pp.107–120).

34. Jamerson, K., Josh, M., & & Joshua, B. (2020). Student-loan debt relief offers support to an economy battered by coronavirus. Wall Street Journal. https://www.wsj.com/articles/student-loan-debt-relief-offers-support-to-an-economy-battered-by-coronavirus-11584735842

35. Jonassen, D., Davidson, M. Collins, M. Campbell, J. & Haag, B. B. (1995). Constructivism and computer-mediated communication in distance education. The American Journal of Distance Education, 9 (2), 7–26.

36. Jon-Chao, H., Yi-Fang, L., & Jian-Hong, Y. (2021). Procrastination predicts online self-regulated learning and online learning ineffectiveness during the coronavirus lockdown. Personality and Individual Differences, 17, 110673.

37. Joshi, O., Chapagain, B., Kharel, G., Poudyal, N. C., Murray, B. D., & Mehmood, S. R. (2020). Benefits and challenges of online instruction in agriculture and natural resource education. Interactive

Learning   Environments,   1–12.
https://doi.org/10.1080/10494820.2020.1725896

38. King, F. B., Harner, M., & Brown, S. W. (2000). Self-regulatory behavior influences in distance learning. International Journal of Instructional Media, 27(2), 147–156.

39. Kotrlik, J. W., & Redmann, D. H. (2005). Extent of technology integration in instruction by adult basic education teachers. Adult Education Quarterly, 55(3), 200-219.

40. Lan, W. (2005). Self-monitoring and its relationship with educational level and task importance. Educational Psychology, 25, 109-127. https://doi.org/10.1080/0144341042000294921

41. Law, Y-K, Chan, C. K., & Sachs, J. (2008). Beliefs about learning, self-regulated strategies, and text comprehension among Chinese children. British Journal of Educational Psychology, 78, 51-73. https://doi.org/10.1348/000709907X179812.

42. Littlejohn, A., Hood, N., Milligan, C., & Mustain, P. (2016). Learning in MOOCs: Motivations and self-regulated learning in MOOCs. Internet and Higher Education, 29, 40–48. https://doi.org/10.1016/j.iheduc.2015.12.003.

43. Magalhaes, P., Ferreira, D., Cunha, J., & Rosario, P. (2020). Online vs. traditional homework: A systematic review on the benefits to students' performance. Computers & Education, 152, 103869. https://doi.org/10.1016/j.compedu.2020.103869

44. Martin, J. The educational inadequacy of conceptions of self in educational psychology. Interchange, 35, 185–208 (2004). https://doi.org/10.1007/BF02698849.

45. Morris, N.P., Hotchkiss, S., & Swinnerton, B. (2015). Can demographic information predict MOOC learner outcomes? Proceedings of the EMOOC stakeholder summit, 199-207.

46. Murdock, T. B. (2000). Incorporating economic context into educational psychology: Methodological and conceptual challenges. Educational   Psychologist,   35(2),   113–124. https://doi.org/10.1207/S15326985EP3502_5

47. Nisbett, R. E. (2007). Intelligence and how to get it: Why schools and cultures count. W. W. Norton & Company.

48. Nunnally, J. C. (1978). Psychometric theory, 2nd ed. New York: McGraw-Hill.

49. Oh, E., & Reeves, T. (2013). Collaborative group work in an online authentic learning environment: An educational design research study. In T. Plomp & N. Nieveen (Eds.), Educational design research—Part B: Illustrative cases (pp. 993–1011). SLO.

50. Peck, L., Stefaniak, J. E., & Shah, S. J. (2018). The correlation of self-regulation and motivation with retention and attrition in distance education. The Quarterly Review of Distance Education, 19(3), 1–15.
51. Pintrich, P. R., Smith, D. A. F., Gracia, T., & McKeachie, W. J. (1991). A manual for the use of the Motivated Strategies for Learning Questionnaire (MSLQ). Ann Arbor, MI. National Center for Research to Improve Post-secondary Teaching and Learning.
52. Pintrich, P. R. (2000). The role of goal orientation in self-regulated learning. In M. Boekaerts, P. Pintrich, & M. Zeidner (Eds.), Handbook of self-regulation (pp. 451–502). Academic Press.
53. Pintrich, P. R (2004). A conceptual framework for assessing motivation and self-regulated learning in college students. Educational Psychology Review, 16(4), 385–407.
54. Pintrich, P. R., Smith, D. A. F., Garcia, T., & McKeachie, W. J. (1993). Reliability and predictive validity of the motivated strategies for learning questionnaire (MSLQ). Educational and Psychological Measurement, 53, 801−813.
55. Puzziferro, M. (2008). Online technologies self-efficacy and self-regulated learning as predictors of final grade and satisfaction in college-level online courses. The American Journal of Distance Education, 22(2), 72–89.
56. Rajab, M. H., Gazal, A. M., Alkattan, K. (2020, July) Challenges to Online Medical Education During the COVID-19 Pandemic. Cureus 12(7): e8966. doi:10.7759/cureus.8966
57. Richardson, J. C., & Swan, K. (2003). Examining social presence in online courses in relation to students' perceived learning and satisfaction. Journal of Asynchronous Learning Networks, 7(1), 68–88.
58. Roy, A. L., Mccoy, D. C., & Raver, C. C. (2014). Instability versus quality: residential mobility, neighborhood poverty, and children's self-regulation. Developmental Psychology, 50(7), 1891–6. https://doi.org/10.1037/a0036984.
59. Startz, D. (2021, January 19). When it comes to student success, HBCUs do more with less. Brookings. http://www.brookings.edu/blog/brown-center-chalkboard/2021/01/18/when-it-comes-to-student-success-hbcus-do-more-with-less/.
60. UNESCO. (2021, February 16). Education: From disruption to recovery. https://en.unesco.org/covid19/educationresponse.
61. Van der Beek, S., Bellhäuser, H., Karlen, Y., & Hertel, S. (2020). New ways in fostering self-regulated learning at university: How effective are web-based courses when compared to regular

attendance-based courses? Zeitschrift für Pädagogische Psychologie, 34(2), 117–129. https://doi.org/10.1024/1010-0652/a000254

62. Van Lancker, W., & Parolin, Z. (2020). COVID-19, school closures, and child poverty: a social crisis in the making. The Lancet Public Health, 5(5), e243-e244.

63. Verstege, S., Pijeeira-Diaz, H. J., Noroozi, O., Biemans, H., & Diederen, J. (2019). Relations between students' perceived levels of self-regulation and their corresponding learning behavior and outcomes in a virtual experiment environment. Computers in Human Behavior, 100, 325 – 334.

64. Walker, L. (2016, November 29). 10 reasons why attending an HBCU was a good idea. HBCU lifestyle – Black College Living. https://hbculifestyle.com/attending-an-hbcu-was-a-good-idea/.

65. Wang, X., Hegde, S., Son, C., Keller, B., Smith, A., & Sasangohar, F. (2020). Investigating mental health of US college students during the COVID-19 pandemic: cross-sectional survey study. Journal of medical Internet research, 22(9), e22817.

66. Whipp, J. L. & Chiarelli, S. (2004). Self-regulation in a web-based course: A case study. Educational Technology Research and Development, 52(4), 5–22.

67. Winne, P. H. (2015). Self-regulated learning. In J. D. Wright (Ed.). International encyclopedia of the social & behavioral sciences (pp. 535–540). (2nd ed.). Oxford: Elsevier.

68. World Health Organization (WHO). (2020, June 29). Timeline: WHO's COVID-19 response. https://www.who.int/emergencies/diseases/novel-coronavirus-2019/interactive-timeline#.

69. Yukselturk, E., & Bulut, S. (2007). Predictors for student success in an online course. Educational Technology & Society, 10(2), 71–83.

70. Ziegahn, L. (2005). Critical reflection on cultural difference in the computer conference. Adult Education Quarterly, 56(1), 39-64.

71. Zimmerman, B. J. (1998). Academic studying and the development of personal skill: a self-regulatory perspective. Educational Psychologist, 33 (2/3), 73-86.

72. Zimmerman, B. J. (2000). Attaining self-regulation: A social cognitive perspective. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), Handbook of self-regulation (pp. 13–39). Academic Press.

73. Zimmerman, B. J. (2008). Investigating self-regulation and motivation: Historical background, methodological developments, and future prospects. American Educational Research Journal, 45(1), 166–183.

74. Zimmerman, B. J. & Moylan, A. R. (2009). Self-regulation: Where metacognition and motivation intersect. In D. J. Hacker, J. Dunlosky, & A. C. Graesser (Eds.), Handbook of metacognition in education (pp. 311–328). Routledge.

75. Zimmerman, B. J. (2013). From cognitive modeling to self-regulation: A social cognitive career path. Educational Psychologist, 48(3), 135–147. http://dx.doi.org/10.1080/00461520.2013.794676