International Journal of Teaching and Learning in Higher Education 2020, Volume 32, Number 1, 49-63
http://www.isetl.org/ijtlhe/ ISSN 1812-9129

Adapting Pink Time to Promote Self-Regulated Learning across Course and Student Types

Timothy D. Baird, David J. Kniola, Kimberly A. Carlson, and Donald G. Russell
Virginia Tech

Joel Hartter and Sarah Rogers
University of Colorado, Boulder

Joseph Tise
Penn State University

To explore new opportunities to promote self-regulated learning (SRL) across a variety of contexts, this study applies a novel assignment called Pink Time in seven different courses at two universities. The assignment asks students to "skip class, do anything you want, and give yourself a grade." In each case, instructors adapted Pink Time to fit the needs of their course. Altogether, 165 students completed 270 self-directed projects and self-assessments targeting five component behaviors of SRL. Findings show that: (1) students were more likely to perceive success in certain behaviors of SRL than in others; (2) students' perceptions across courses were similar for some behaviors but not others; and (3) subsequent iterations of the assignment supported higher perceived measures of some SRL behaviors but not others. Together these findings illustrate the value and flexibility of this progressive assignment as well as persistent challenges in supporting students' SRL.

In the past few decades, self-regulated learning (SRL) has become a key concern for scholars of teaching and learning and education researchers (Dignath & Büttner, 2008; Nilson, 2013; Winne, 2005). SRL, which involves students' abilities to define work for themselves, make plans, and self-monitor and evaluate (Azevedo, Moos, Johnson, & Chauncey, 2010), is positively associated with academic achievement and motivation (McCombs, 1989; Zimmerman, 1990). Furthermore, the skills and processes that characterize SRL are precisely what the modern economy rewards. However, even as the benefits of SRL become clearer, many college students have become conditioned to seek out and follow instructions from an external authority figure (Deresiewicz, 2014).

To respond to this entrenched and narrow vision of credentialism, especially in the U.S., new disruptive strategies are needed to encourage students to serve as leaders of their own education. Recently, a novel strategy to promote SRL and academic motivation was proposed and tested in a single university classroom (Baird, Kniola, Lewis, & Fowler, 2015). Pink Time (PT) is an assignment, initially inspired by Daniel Pink's book *Drive* (2009), in which university students are instructed to "skip class, do anything you want, and grade yourself." Students are then required to return to class, share their activities publicly, and complete an instructor-provided self-assessment. The logic here is to broaden students' perceptions of what learning is and where it happens, promote student autonomy, undermine extrinsic motivations (like instructor-assigned grades), and encourage metacognitive reflection.

This seemingly radical assignment raises two key questions: Can the PT assignment be applied effectively in diverse academic contexts? What aspects of SRL does it address? To respond to these, we have applied the PT assignment in seven different courses at two universities, with two degree-types, across a range of disciplines. In each case, the assignment was adapted to best suit the instructor's philosophy and course schedule. In this paper, we seek to contribute to the scholarship on SRL in university settings by comparing and contrasting applications of the assignment and their attending outcomes. In doing so, we move beyond a theoretical understanding of SRL as a metacognitive process and move towards a practical application designed to facilitate a cognitive and affective learning experience.

Given the current level of interest surrounding SRL generally and PT specifically, our study focused on two central research questions: (RQ1) How do students' self-assessments for different SRL behaviors compare across courses and degree-types?, and (RQ2) How do students' self-assessments of SRL behaviors change in subsequent iterations of the assignment within a course?

Literature Review

Learning in Higher Education

To strengthen teaching and learning in higher education, educators and scholars have examined topics that range from the social dynamics involved in learning to the learning functions of the brain. Despite the inherent complexity of the learning process, science-based understanding of how learning works has progressed rapidly in recent decades. Spurred by advances in medical and computer technologies, our understanding of the brain and the cognitive processes associated with learning have grown (Lee et al., 2016; Zatorre, Fields, & Johansen-Berg, 2012). Advances in the learning sciences have led to new theories of how learning occurs and new practical applications for teaching. Three broad learning theories – behaviorism, cognitivism and constructivism – hold that learning occurs *within* the individual. In addition, new theories, like connectivism (Siemens, 2005), which highlight the

influences of computer-based technologies and personal networks, have advanced the idea that learning happens *outside* the individual.

Studies of the brain have led to important new insights for higher education. This work has expanded our understanding of how students experience and organize knowledge (Ertmer & Newby, 1993); the role of student intellectual, social, and emotional development (Chickering & Reisser, 1993); and the impacts of learning environments and institutional climate (Browman & Destin, 2016; Hall & Sandler, 1982; Strange & Banning, 2015), which can be unique in university settings (Pascarella & Terenzini, 2005). Insights in these areas build upon a longstanding appreciation of learning as a social and interactive process (Dewey, 2007 [1938]; Vygotsky, 1978) where a "total system" of links among students, teachers, activities, and outcomes supports learning (Biggs, 1993). Taken together, these foci on the student and the context have driven recent research on students' diverse motivations, interests and competencies (Biggs, 1987; Jones, 2009; Schunk, Meece, & Pintrich, 2014) as well as related student-centered approaches.

Principal among these are approaches that encourage metacognition – or students' capacities to examine the broader contexts of their own learning. Metacognition itself has been a theme in the scholarship of teaching and learning for decades. Early researchers, especially Flavell (1979), identified metacognition as an acute awareness of knowledge as a cognitive phenomenon, or cognitive monitoring. Later, Metcalfe and Shimamura (1994) described it more simply as "what we know about what we know" (p. xi). While cognition is the process of thinking, metacognition is an intentional "process of reflecting on and directing one's own learning" (Pellegrino, Chudowsky, & Glaser, 2001). Research shows that two components are central to metacognition: (1) awareness of thoughts and (2) control over the direction of the thought process (Brown, Bransford, Ferrara, & Campione, 1983; Hacker, Dunlosky, & Graesser, 2009; Paris & Winograd, 1990; Pintrich, 2002).

Self-Regulated Learning

Researchers have extended the theory of metacognition to formal learning environments and academic learning. An approach, championed by Pintrich (1991) and others, which focuses on information processing, is now more commonly known as SRL. Conceptually, SRL involves student regulation of cognition, motivation, behavior, and context – each requiring effort to control tasks and to act as an agent of their own thinking (Kluwe, 1982; Zimmerman, 1989). This approach maintains that students must cultivate intentionality and self-awareness with their learning (Paris & Winograd, 1990; Pintrich, 2002) by constructing thoughts, shifting behaviors, and monitoring consequences (Hacker et al., 2009).

Students who cultivate an SRL approach to learning more effectively learn on their own. They define tasks, set goals, make plans, select strategies, self-evaluate, and self-monitor (Azevedo et al., 2010). They have developed personalized processes to acquire and retain information and construct knowledge and to reflect on what they know and do not know (Zimmerman & Kitsantas, 2005). The ways these students perceive learning, use cognitive processes to regulate learning behaviors, and manage motivation all play a substantive role in their ability to achieve academic success. As actively engaged participants in their learning, students exhibit a sort of self-oriented feedback loop (Carver & Scheier, 1981), persist in learning activities (McCombs, 1989), and perceive global and domain specific self-efficacy (Pajares, 1996). Simply stated, self-regulated learners create for themselves a personal environment within which they can efficiently and effectively learn.

Numerous studies have identified a broad range of factors that support SRL, including students' dispositional characteristics and instructors' pedagogical strategies. Students' beliefs about their ability to perform a task and the value they place on the task (Wigfield & Eccles, 2000), along with the belief that learning and mastery are worthy goals, promote SRL (Pintrich, 1999; Pintrich & de Groot, 1990). Emotion has been another focus of study (Pekrun, Goetz, Titz, & Perry, 2002). Recently, Mega, Ronconi, and De Beni (2014) found that undergraduates' positive emotions predicted several aspects of SRL, including organization of study time and materials, evaluation of learning, preparation for exams, and metacognition. And Madjar, Kaplan, and Weinstock (2011) found that positive affect in middle and high school students was directly related to SRL strategy use. Relatedly, negative affect and adverse changes in middle school students' academic emotions have been linked to maladaptive SRL strategy use and declines in SRL, respectively (Ahmed, van der Werf, Kuyper, & Minnaert, 2013; Madjar et al., 2011; Madjar, Weinstock, & Kaplan, 2017).

One area of scholarship has focused on instructor-based strategies to promote SRL. The relationship between problem-based learning (PBL) and SRL has been examined in many contexts with findings generally supporting the hypothesis that students engaged in PBL exhibit higher measures of SRL compared to students in traditional lecture-based curricula (Blumberg, 2000). In one carefully controlled study, Sungur and Tekkaya (2006) found that PBL students demonstrated higher values of several SRL components including goal setting, task value, strategy

Table 1
Study Course Characteristics and Pink Time Adaptations

Course Field	Degree Level	University (A or B)	Num. of Students	Num. of Pink Times	Assignment structure (adaptations)
Education	Grad	A	15	1	Do anything (related to course). Grade yourself anonymously.
Environmental Studies	Grad	B	10	2	Do anything (related to course). Grade yourself (publicly).
Environmental Studies 1	Undergrad	B	26	2	Do anything (related to course). Grade yourself (publicly).
Environmental Studies 2	Undergrad	B	28	1	Do anything (related to course). Grade yourself anonymously.
Management	Undergrad	A	22	2	Do anything (related to course). Grade yourself anonymously.
Military Leadership	Undergrad	A	38	1	Do anything (related to course). No grades.
Sustainability	Undergrad	A	26	3	Do anything. Grade yourself anonymously.

use, critical thinking, metacognition, and peer learning compared to control-group students. Others have described the relationship between PBL and SRL as reciprocal with SRL serving as a critical skill for success in PBL (English & Kitsantas, 2013). Now scholars are distinguishing between types of non-traditional pedagogical approaches, finding in one instance that a project-based learning strategy was associated with higher measures of SRL than a PBL strategy (Stefanou, Stolk, Prince, Chen, & Lord, 2013).

Other instructor-based strategies to promote SRL focus on instructor feedback, especially formative assessment. Formative assessment has been described as an approach that includes assessment *for* learning with assessment *as* learning (Clark, 2012). Assessment *for* learning involves instructor feedback that describes how the learner can improve rather than feedback that simply praises or punishes (Hattie & Timperley, 2007). Assessment *as* learning involves collaborative and individual reflection on evidence of learning (AAG, 2008). Others have pointed out that instructors should work to identify, and build on, students' own perceptions and assessments of their work (Nicol & Macfarlane-Dick, 2006). Relatedly, interactions between teacher autonomy support and structure can foster SRL (Jang, Reeve, & Deci, 2010; Sierens, Vansteenkiste, Goossens, Soenens, & Dochy, 2009).

While these and other strategies exist to promote SRL, including motivation and metacognitive strategies, Dignath and Büttner (2008) have pointed out through their review of studies on how to promote SRL: "[I]t becomes obvious that there is still a gap in the research on how teachers can bring SRL into the classroom. Most studies report attempts to improve students' academic self-regulation, but only little information is available about supporting teachers in how to do so" (p. 232). We use this as a point of departure for this study with the purpose of investigating the viability of Pink Time as a strategy for promoting SRL.

Study Setting

Following an introduction and examination of the PT assignment by Baird et al. (2015), several colleagues expressed interest in applying the assignment in their own classes. This study has grown from these inquiries. Together, six faculty members from two universities adapted the assignment in seven classes: five at the undergraduate level and two at the graduate level. These courses are in the fields of Education, Environmental Studies, Management, Military Leadership, and Sustainability. In each case, the faculty member adjusted the original assignment (described in the introduction) as she/he deemed appropriate for the course. These adjustments included changes to: (1) the content of the assignment (i.e., having PT activities relate directly to the course (note: the original assignment did not require this)); (2) the number of iterations of the assignment (e.g., 1, 2, 3); and/or (3) the use of self-grading (e.g., student's grades are private, shared publicly in class, or grades aren't included as part of the assignment). Table 1 lists the

Table 2
Characteristics of the Sample (N=165)

Characteristic	n	%N
Institution		
University A	101	61
University B	64	39
Academic Field of Course		
Environmental Studies	64	39
Education	15	9
Management	22	13
Military Leadership	38	23
Sustainability	26	16
Degree Level		
Undergraduate	114	69
Graduate	51	31
Iterations experienced by student		
One	81	49
Two	58	35
Three	26	16

study courses and key modifications of the assignment. For each of the courses, three attributes of the original assignment remained unchanged: (1) students were given a class period to work on their activities (i.e., skip class); (2) the following class period was used to share and discuss students experiences as a group; and (3) students completed a SRL instrument following each iteration of PT. IRB consent and data were collected by the instructors, each of whom is an author of this paper.

While describing students' specific PT activities is not the focus on this paper, it may be useful to note that students across the study courses engaged in a great diversity of projects and activities, which is consistent with earlier scholarship on PT (Baird et al., 2015). Students engaged in passive learning activities like reading, watching videos, or attending lectures on a wide range of topics. They also engaged in active and service-learning activities like designing and running small research projects, learning new skills, interviewing people, or volunteering. And other students engaged in creative activities like various writing projects (e.g., short stories, songs, poems), or graphic, visual and media arts activities (e.g., painting, illustration, video production). This paper focuses on students' perceptions of their own SRL as they relate to these diverse activities.

Methods

Sample

To address each research question, we collected and assessed student data from seven different courses at two universities where the PT assignment was applied during a single academic year. Universities were selected based on interest from participating faculty members. Courses were in the five previously identified fields and included graduate- and undergraduate- level courses. In each case, PT was modified by the instructor to suit the needs of their specific course (e.g., determining level or relatedness of the project topic to course content, etc.) (see Table 1) and was run between one and three times during the semester. Prior to the initial PT activity, students in each class were shown a Daniel Pink video that describes his observations in *Drive* that extrinsic motivations can crowd out intrinsic motivations. Students were not introduced to the SRL concept specifically, but they were informed that the point of the PT assignment was to pursue their interests and take charge of their own learning. Student participants were routinely enrolled in each course and were not randomly assigned. Altogether, 165 students completed 270 PT projects (since students in some courses were asked to complete multiple PT projects). Table 2 shows the characteristics of the study sample.

Instrument

For each project, students completed a self-assessment instrument designed to measure the relationship between their own perceptions of their work and a set of behaviors indicative of SRL (Nilson, 2013;Schunk & Zimmerman, 2012; Zimmerman, 1990). The rubric, which was originally co-designed by researchers and students (Baird et al., 2015), distinguished between multiple SRL behaviors, including: Choice, Complexity, Effort,

Persistence and Curiosity. Baird et al. (2015) defined these categories thusly:

> [W]e define Choice as a series of decisions about the source of knowledge, connections to the course material and individual interests. Complexity is defined as a surface-level versus deep approach to inquiry and learning. Effort is defined as the amount of time spent on an activity and the intentionality with which the activity is conducted. Persistence is defined as the student's ability to work through a course of action despite difficulty. More broadly, this is the ability to work through challenges and roadblocks. And Curiosity is defined as inquisitive thinking and discovery whereby the student grounds her work in inspiration rather than simply information collection (p. 149).

For each SRL behavior, the rubric distinguished between developing, competent and exemplary levels of behavior. Descriptions of these behaviors and levels, which are the same as those used in Baird et al. (2015), are presented in Table 3. For each behavior, students identified the most appropriate level of behavior. For example, a student might select "developing" if she passively acquired new knowledge (Choice) or performed an activity for a limited amount of time (Effort). In cases where the student selected multiple levels, we retained the higher level in order to highlights students' own perceptions of their success.

Procedures

The study was designed to introduce a treatment (PT) and measure student perceptions of SRL following the assignment. To address each research question, we conducted descriptive and inferential statistical analyses of student-generated data acquired through the instrument. Our assessment focused initially on the percentage of students who reported each behavior level for each SRL behavior. In each course, the instructor assigned at least one iteration of the assignment (n=7). We compared percentages of students reporting Developing, Competent, and Exemplary for each of the SRL behaviors (Choice, Complexity, Effort, Persistence, Curiosity) across each of the classes. This was done to highlight differences across courses and degree types (RQ1). For the courses where instructors assigned two or more iterations of the assignment (n=4, three undergraduate and one graduate), we compared changes, across courses, in the percentages of students reporting each SRL behavior level (RQ2). Only one course completed three iterations of PT.

As with any cognitive process, SRL is problematic to directly observe. Our goal was to identify a set of observable behaviors easily recognizable by student participants. Combined, these behaviors serve as a proxy for the phenomenon of interest in this study. We constructed a new dependent variable representing

Table 3
Self-regulated Learning Instrument (reproduced from Baird et al. 2015)

	Levels of Behavior		
Behaviors	Developing	Competent	Exemplary
Choice	I acquired new knowledge passively.	I acquired new knowledge actively.	I created new knowledge.
Complexity	I thoughtfully and accurately engaged 1 learning tool for my activity: reading/listening/watching; socially interactive; creative/design; computational; etc.	I thoughtfully and accurately engaged 2 learning tools for my activity: reading/listening/watching; socially interactive; creative/design; computational; etc.	I thoughtfully and accurately engaged 3 or more learning tools for my activity: reading/listening/watching; socially interactive; creative/design; computational; etc.
Effort	I spent less than 3 hours on my activity.	I spent between 3 and 5 hours on my activity.	I spent more than 5 hours on my activity.
Persistence	My values, beliefs, and skills were minimally challenged by my activity.	My values, beliefs, and skills were somewhat challenged by my activity.	My values, beliefs, and skills were significantly challenged by my activity.
Curiosity	I explored my activity at a basic level, resulting in little insight beyond the basic facts and a low level of interest in the subject.	I explored my activity with some evidence of depth, resulting in new insight and mild interest in the subject.	I explored my activity in depth resulting in interest in the subject.

propensity to engage in SRL behaviors by first weighting and then summing behavior levels from the instrument. Developing responses were weighted "1," competent responses were weighted "2," and exemplary responses were weighted "3". For each student, weighted responses of the five SRL behaviors, were summed to create a total SRL score. The possible range of scores is 5 (five items each weighted for developing) to 15 (five items weighted for exemplary). In the few cases where a student did not answer an item on the instrument, the total score may be less than 5. The total score represents a student's propensity to engage in SRL behaviors.

It is important to note that the response options we use to construct the SRL propensity score are categorical. Arguably, converting categorical data to continuous data is problematic in that it converts a category used by participants to define themselves into a numeric expression defined by the researchers. However, continuous variables may be more useful in quantitative comparisons of multiple groups of data. In theory, continuous dimensions may ultimately underline ordinal, categorical measures. Fundamentally, the factors we identify represent dimensions of a construct (now represented as a continuous variable) that provides more robust information regarding any differences among values of a categorical response (Shoemaker, Tankard Jr, & Lasorsa, 2003).

Results

Table 4 presents, by course and degree-level, students' self-reported levels for each SRL behavior during PT1 (RQ1). Generally, these results exhibit a number of patterns. First, for the Choice and Persistence behaviors, each of the course distributions of behavior levels are peaked. This means that the competent level, for each class, has the highest percentage with lower percentages for the developing and exemplary levels. Second, for six courses, the Curiosity behavior exhibits a positively sloped distribution, with the developing having the lowest percentage and exemplary having the highest. One undergraduate course had a peaked distribution. These three behaviors (Choice, Persistence, and Curiosity) therefore exhibit notable consistency across courses. The remaining two behaviors are more diverse. Third, for the Complexity behavior, four courses have positive-sloped distributions, two courses have peaked distributions, and one has a U-shaped distribution wherein the Competent level has the lowest percentage. Lastly, the Effort behavior has four courses that have peaked distributions, two with negative-sloped distributions, and one with a positive-sloped distribution. For neither of these more "diverse" behaviors is degree-level a relevant distinction.

Figures 1 through 5 present measures of change for each of the four courses where two iterations of the assignment were conducted (RQ2). For each SRL behavior, we plot the change in the percentage of students reporting each behavior level for each class. These changes are represented with stacked bar-graphs with increases plotted above zero on the y-axis and decreases plotted below zero. For example, if distribution of students reporting competent, developing and exemplary for an SRL behavior went from 40%, 40%, 20% respectively in PT1 to 30%, 30%, 40% in PT2, the stacked bar would show an increase of 20% (represented above 0) for exemplary, and a corresponding decrease of 10% for each of the other two levels (represented below 0). This approach shows the magnitude and direction of change for each course and SRL behavior level. First, the magnitude of change between PT1 and PT2 is generally greater for Choice, Complexity and Effort than for Persistence and Curiosity across courses. Second, the direction of change is generally positive across courses. The bars show that exemplary is generally above 0 while developing is generally below. More specifically, of the 20 bars presented (one bar for each of four classes for each of 5 SRL behaviors), 13 show the percentage of students reporting higher behavior levels increasing and lower behavior levels decreasing. Five bars show a "split" where an increase or decrease in competent corresponds to a decrease or increase, respectively, in developing and exemplary. Two bars show increases in lower-level behaviors at the expense of higher-level behaviors (see Figs. 3 and 5).

Given that these analyses indicate some differences across SRL behaviors, some similarities across courses, and some growth across iterations of the assignment, we also examined SRL propensity scores to investigate: (1) growth across iterations, and (2) differences between undergraduate and graduate students. We did not, however, examine institutional differences or course-level differences.

Overall mean scores for each iteration of the assignment are reported in Table 5. Mean scores for pooled undergraduate and graduate students show a change in propensity scores from PT1 to PT2. We ran separate paired sample *t* tests between PT1 and PT2 and then PT2 and PT3. There was a significant difference between PT1 (M=10.35, SD=2.26) and PT2 (M=11.03, SD=2.22), $t(77)=2.17$, $p=.03$. The difference between PT2 and PT3 was not significant.

Lastly, we applied an independent sample *t* test and found statistically significant differences by degree level. With PT1, graduate students report higher propensity scores (M=10.63, SD=2.34) than undergraduate students (M=9.73, SD=2.37), $t(159)=2.21$, $p=.03$. In PT2, while the mean scores for graduate students (M=11.47, SD=1.73) were higher than the scores for undergraduates (M=10.79, SD=2.45), the difference between these two groups was not statistically significant. No graduate students participated in PT3.

Table 4
Percentages of Students, by Course, Reporting for Each SRL Behavior Level for PT1

	Courses						
Behavior Levels	Education	Env. Studies (Grad)	Env. Studies (Ugrad 1)	Env. Studies (Ugrad 2)	Military Leadership	Management	Sustainability
Choice							
Developing	7%	20%	17%	18%	19%	33%	36%
Competent	73%	70%	57%	64%	69%	52%	56%
Exemplary	20%	10%	26%	18%	11%	14%	8%
Total	100%	100%	100%	100%	100%	100%	100%
*n**	15	10	23	28	36	21	25
Complexity							
Developing	8%	0%	22%	11%	24%	45%	12%
Competent	62%	50%	39%	59%	35%	14%	36%
Exemplary	31%	50%	39%	30%	41%	41%	52%
Total	100%	100%	100%	100%	100%	100%	100%
n	13	10	23	27	37	22	25
Effort							
Developing	15%	0%	5%	26%	63%	27%	42%
Competent	54%	30%	80%	52%	21%	73%	42%
Exemplary	31%	70%	15%	22%	16%	0%	15%
Total	100%	100%	100%	100%	100%	100%	100%
n	13	10	20	27	38	22	26
Persistence							
Developing	38%	22%	18%	26%	32%	5%	26%
Competent	46%	56%	59%	39%	50%	76%	48%
Exemplary	15%	22%	23%	35%	18%	19%	26%
Total	100%	100%	100%	100%	100%	100%	100%
n	13	9	22	23	34	21	23
Curiosity							
Developing	0%	0%	0%	4%	3%	5%	0%
Competent	36%	30%	41%	41%	59%	33%	44%
Exemplary	64%	70%	59%	56%	38%	62%	56%
Total	100%	100%	100%	100%	100%	100%	100%
n	14	10	22	27	38	21	25

* Student non-responses are excluded from the percentages, which correspondingly show percentages relative to response rather than class size.

Table 5
Overall SRL Propensity Scores

	n	Min.	Max.	Mean SRL	Std. Dev.
PT 1	161	3	15	9.99	2.39
PT 2	82	5	15	11.07	2.19
PT 3	26	4	15	11.08	2.48

Discussion

These results describe how a range of students in different types of courses responded to derivations of the PT assignment. Specifically, the results illustrate how students' self-assessments of multiple SRL behaviors varied (RQ1) and how subsequent iterations of the assignment were associated with changes in these behaviors (RQ2). Taken together these findings provide some support for the adaptability of the PT assignment across a range of course and student types and also highlight its strengths and weaknesses in promoting SRL.

Two main takeaways from students' initial experiences with PT are evident in Table 4. First, students' patterns of behavior levels are broadly consistent for some SRL behaviors but not others. As noted above, distributions of behavior levels were uniformly peaked for Choice and Persistence. Similarly, six of seven courses had positive-sloped distributions for Curiosity. This suggests that students across courses and degree levels are responding similarly to these SRL behaviors. Second, students reported consistently higher behavior levels for some SRL behaviors than others. A comparatively higher percentage of students indicated "exemplary" performance for the Complexity and Curiosity components, while a lower percentage did for Choice and Persistence. This is not necessarily surprising. Lower measures of Choice and Persistence may signal students' familiarity with passive learning experiences and general discomfort with activities that challenge their values, beliefs or skills (Graham, Tripp, Seawright, & Joeckel, 2007; Liu & Littlewood, 1997) and general discomfort with activities that challenge their values, beliefs or skills. Alternatively, higher measures of Curiosity and Complexity may highlight students' desire, and perceived agency, to select activities that interest them and explore them in diverse ways, respectively (Stefanou, Perencevich, DiCintio, & Turner, 2004).

Stratifying pooled graduate and undergraduate students and integrating SRL behaviors into a single SRL propensity score (see Table 5) offered additional insights. While graduate students reported significantly higher SRL scores than undergraduates for PT1, the difference was not dramatically higher. This gives rise to a few ideas. First, graduate students likely approach their educations in more nuanced ways and actively seek deep learning experiences. While many graduate students are at the beginning stages of becoming independent thinkers, others have already sorted out learning behaviors indicative of SRL even without explicit knowledge of SRL. In other words, graduate students are generally highly successful students who are curious about the world around them, are persistent, sustain maximum effort, embrace complexity, and make choices that challenge their world views (Artino & Stephens, 2009; Pintrich, 2003). One potential explanation for why the difference between graduate students and undergraduate student groups is not greater here is that student responses to the instrument items were likely influenced by prior education and life experiences. Graduate students, for example, may have been more self-aware, and more critical of their learning behaviors. In other words, undergraduate students may have overinflated their responses while graduate students may have represented theirs more accurately.

For those courses that offered two iterations of PT, Figures 1-5 highlight where measures of SRL components changed. Generally, students progressed from lower behavior levels to higher levels, with the largest increases in Choice, Complexity, Effort and more modest increases in Persistence and Curiosity (with exceptions). A closer look at each SRL behavior is illustrative.

Figure 1

Change in percentage of student reporting developing, competent, exemplary for CHOICE between PT1 and PT2

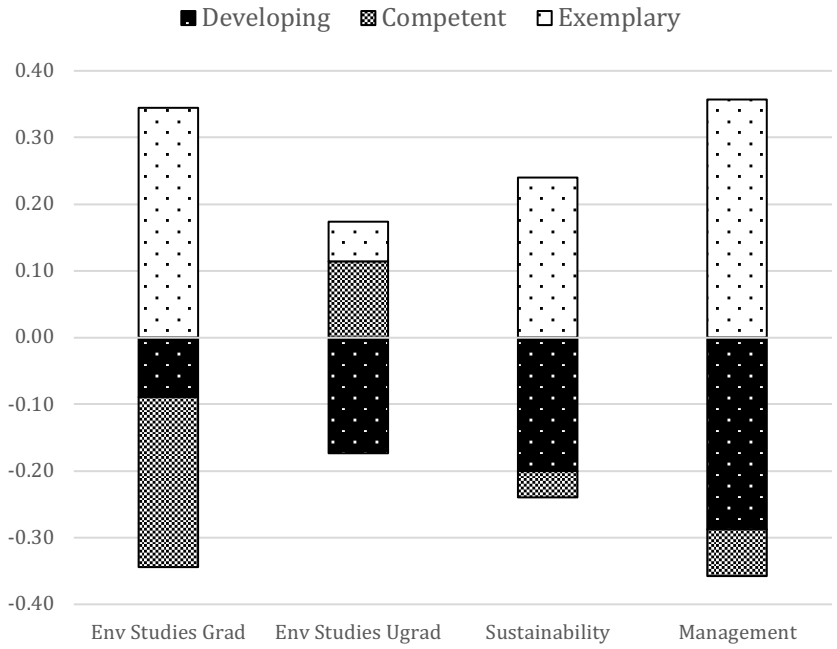


Figure 2
Change in percentages of students reporting developing, competent, and exemplary for COMPLEXITY between PT1 and PT2

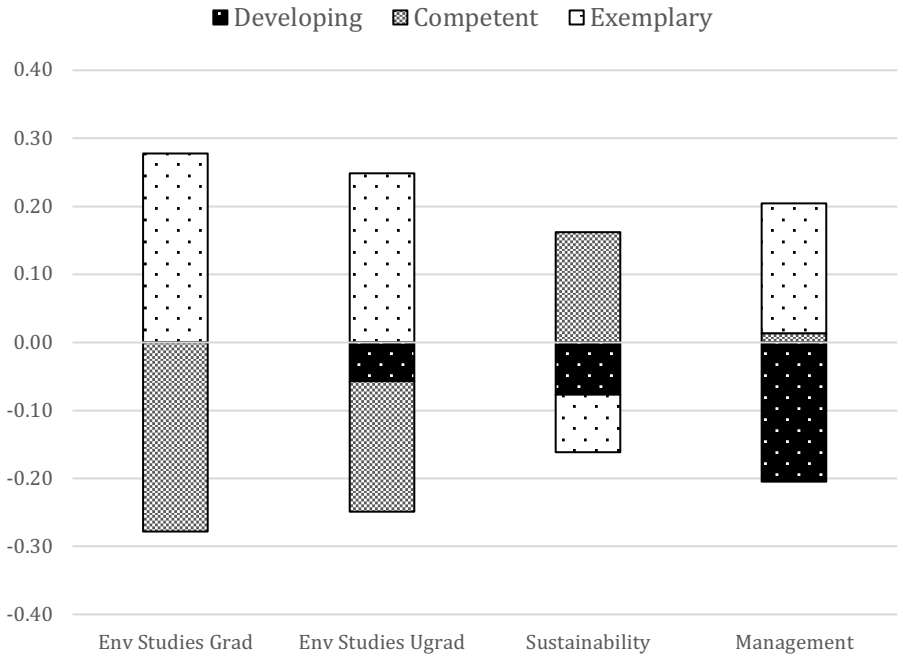


Figure 3
Changes in percentages of students reporting developing, competent, and exemplary for EFFORT between PT1 and PT2.

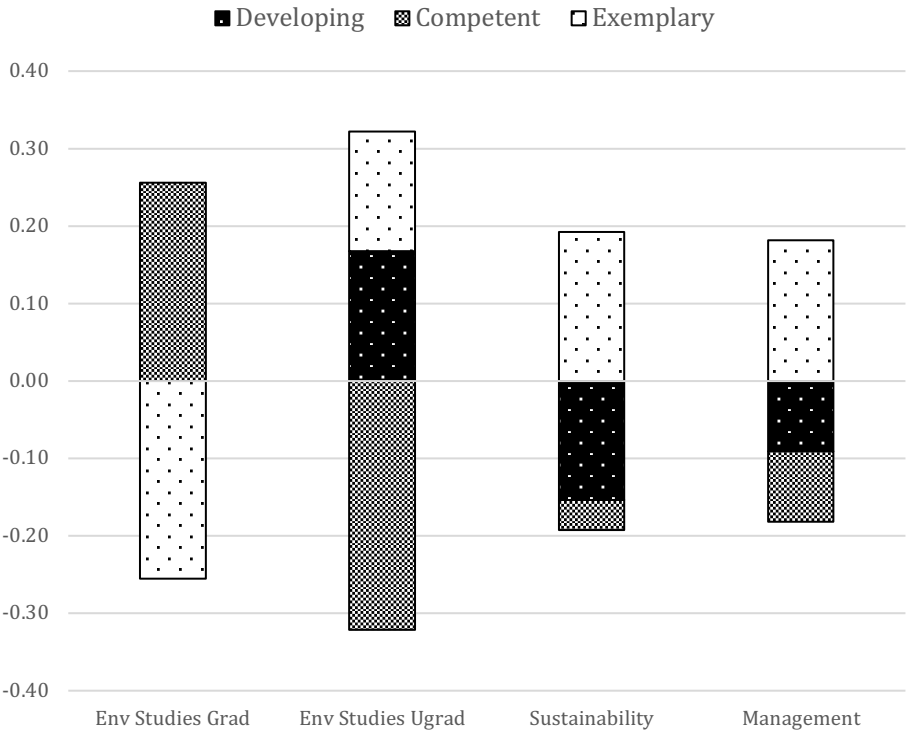


Figure 4.
Changes in percentages of student reporting developing, competent, and exemplary for PERSISTENCE between PT1 and PT2

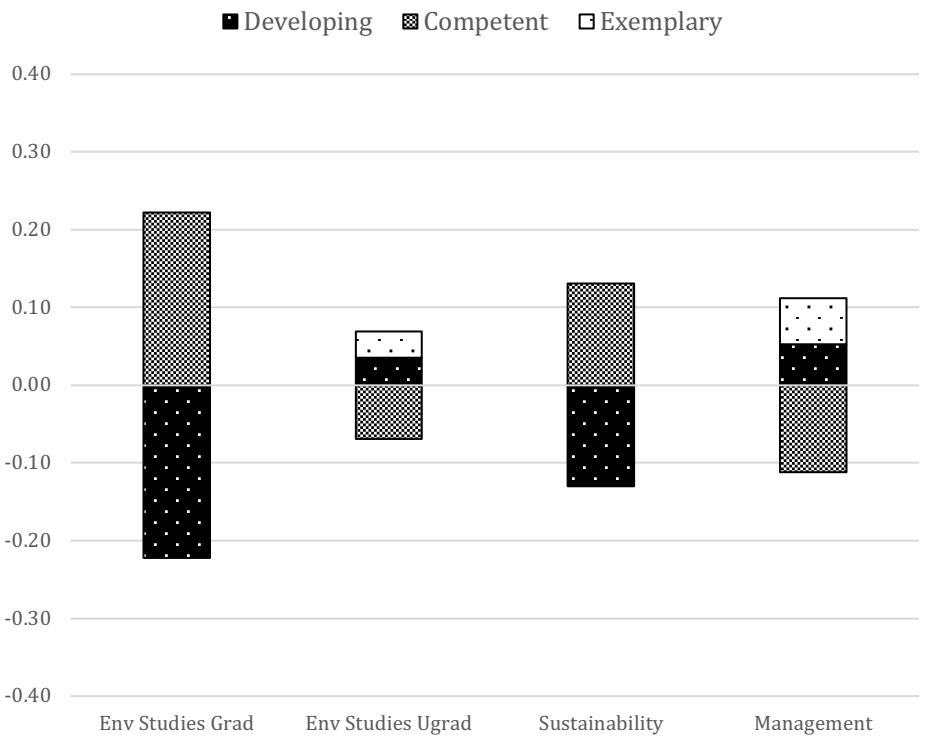
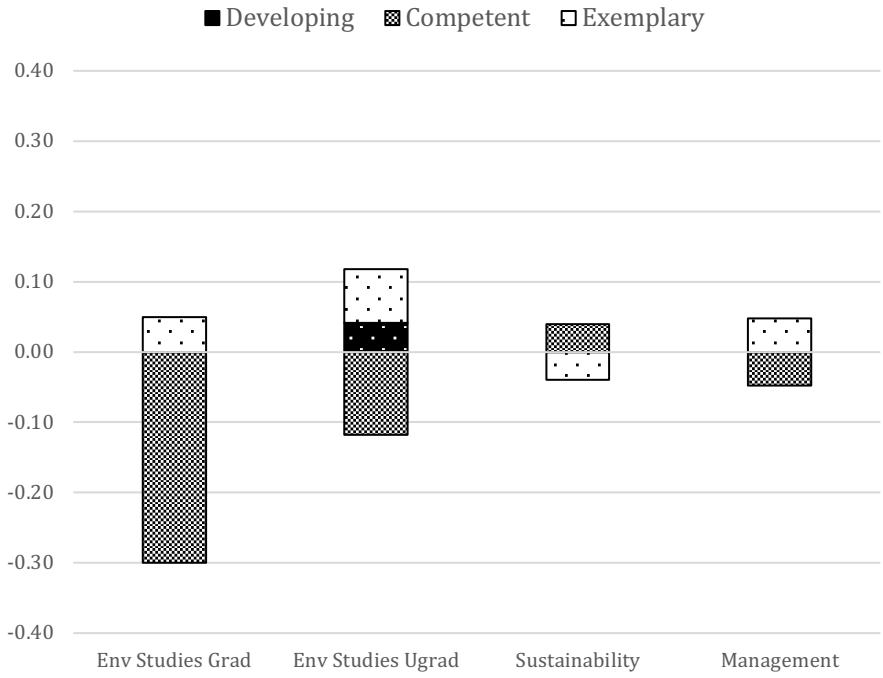


Figure 5
Changes in percentages of students reporting developing, competent, and exemplary for CURIOSITY between PT1 and PT2. (The asymmetric bar results from student non-responses.)



For PT1 the majority of students in each class rated Choice as competent (Table 4). Again, this is unsurprising given students' traditional academic experiences where they passively receive information and have little freedom. Intermediate ratings reflect students' preconceived notions of what is okay for a class project: of what will be viewed as valid by the authority figure in the class. Students view valid knowledge acquisition as passive (Lake, 2001; Machemer & Crawford, 2007), and to begin the PT assignment, they played it safe. But with the second iteration, students took more chances and broadened their learning activities (see Figure 1), especially when grades where de-emphasized (i.e., anonymous).

Ratings of Complexity varied in PT1 (see Table 4) with comparatively high percentages of exemplary and mixed percentages of developing and competent. In PT2 (see Fig. 2), three of four courses increased from lower behavior levels to higher ones. The fourth course, which offered students the most latitude to define their activities (i.e., "do anything"), saw an increase in competent with attending decreases in the lower level developing and the higher level exemplary.

Ratings for Effort also varied in PT1 with graduate students generally spending more time on their activities (see Table 4), which is unsurprising. With PT2, undergraduates tended to increase the amount of time while graduate students decreased the amount (see Figure 3), though still spent more time than undergraduates. This convergence of Effort across degree-levels may point to a type of perceived balance between the PT assignment and the other demands of student life and academics. Another potential explanation is that the timing of the assignment in the semester may affect time available to perform the activity, with "high workload" times crowding out time for the PT assignment (Kausar, 2010).

One of the more interesting findings here is that ratings of Persistence were comparatively low in PT1 (see Table 4) and changed comparatively little in PT2 (see Fig. 4), though there was some growth from lower behavior levels to higher levels. Graduate students reported the most positive growth. Here, students demonstrated a relative aversion to stepping outside their boxes. According to our rubric, few students indicated that their "values, beliefs, and skills were significantly challenged" by their activities. This also is unsurprising given the fear of failure that can be found in academic settings (Bartels & Magun-Jackson, 2009; De Castella, Byrne, & Covington, 2013). Student may have viewed this as an opportunity to lean into their interests rather than seek real challenges (Shim & Ryan, 2005). This finding especially will change the way some of us run this assignment in the future. If this is viewed as an important outcome, other strategies will be needed.

Lastly, ratings of *Curiosity* started comparatively high in PT1 (see Table 4) and didn't change much in PT2 (see Fig. 5). This seems to suggest that the students used the assignment, not unreasonably, to pursue existing interests rather than explore *potential* new ones. This finding has helped us to reflect on how we present the assignment in class. Indeed, we tell students that PT is an opportunity to pursue their interests. In the future, however, it may be worth suggesting that this is also an opportunity to pursue potential interests and even perspectives that contradict their own.

An important note here is that changes in students' self-assessments of SRL characteristics may reflect actual changes, changes in their perceptions of the SRL rubric (Table 2), or both. For example, with subsequent iterations of the assignment, students may come to interpret terms within the rubric, like "thoughtfully," "accurately," or "in depth," with greater fidelity. This may drive them to rate themselves lower on the rubric and/or work harder on their activities. In either case, however, learning can occur. One very important outcome of this assignment is to engage students in an exploration of what learning is, how it occurs, and what their responsibilities are. This has been a meaningful outcome for many students we've spoken with. Through PT, students have acquired new vocabulary and awakened to the types of behaviors that comprise SRL. Future research on this assignment should examine how student perceptions of the rubric change over time, as well as how students evolving understandings of learning promote more critical reflection on their own learning behaviors.

Faculty Experiences

One of the benefits of PT is the space it creates to reflect on learning and the course environment for both the students and the instructors. Our own experiences with PT have been diverse. First, we each came to the assignment for different reasons. Some felt that the spirit of the assignment related directly to the content of the course. Specifically, for courses that address issues of organizational behavior, citizenship, leadership, engagement, and motivation, the PT assignment directly supported the existing content and learning objectives. For other courses, the connection was indirect. In these cases, PT served more as an experiment than as an application. Some of us wanted to break out of our routines of lecture and encourage more student engagement. Others were just curious to see what students would come up with, as well as what new ideas may be generated for future classes. In some cases, instructors chose to seize on the opportunity to highlight "learning" itself as an object of critical thinking.

One thing we authors have shared is the anxiety that comes from surrendering control in the classroom. For most of us, using PT has meant cutting one to two weeks of content from our courses and disrupting the narrative arc of the class. Furthermore, there was no guarantee how students would respond to the type of freedom that PT provides. Students may not take the assignment seriously. They may simply give themselves high grades for poor work. Furthermore, the assignment may undermine our creditability with our colleagues. For each of us, the decision to go ahead with PT felt like a leap of faith.

Following our experiences, other commonalities emerged. One clear positive side of the assignment is that it provided real opportunities for instructors to get to know their students personally, as well as for the students to learn about (and from) each other. This can create more "buy-in" within the class and strengthen the learning community. In many cases, students surprised faculty members with their activities, which were creative, personal, ambitious, and impressive. But not all students respond this way. Some use PT as an opportunity to get caught up on other work or to de-stress in various ways, which one author has framed as self-care. It can be tempting for instructors to call out poor effort, but this action risks undermining the trust they are trying to build with students.

The value of this assignment for students, especially in terms of metacognition and self-reflection, can be challenging for instructors to observe directly. The time in class reserved for sharing and reflecting on students' activities, discussing challenges and opportunities with the assignment, and making plans for iteration (in some cases) is critical to shaping students' perceptions of PT as a valid pedagogical strategy, as well as instructors' perceptions of the outcomes associated with the assignment. Along these lines, instructors can bolster the assignment throughout the semester by: (1) prompting students to reflect on their own education and their agency to shape it; and (2) helping students connect their interests (gleaned from their PT activities) to the regular course content.

Conclusion

Many university students find it difficult to trust themselves to direct their own learning and simply want to be told what to do (Deresiewicz, 2014). To challenge these entrenched behaviors and patterns, new ideas are needed to "bring SRL into the classroom" (Dignath & Büttner, 2008). Here, we have presented a simple, instructor-based strategy that can be easily adapted to suit diverse instructors, students, disciplinary contexts, and pedagogical philosophies, and with notably similar outcomes. With PT, students have the autonomy to set goals, define tasks, make plans and self-evaluate (Azevedo et al., 2010). Furthermore, they can nurture their own intrinsic motivations to acquire, retain and integrate information and to construct knowledge for themselves (Zimmerman & Kitsantas, 2005).

Additionally, PT can help to identify patterns and trends in various aspects of SRL. Following students' PT activities, instructor-led summative reflections on their SRL revealed that the assignment bolstered students' senses of agency surrounding learning and their use of various approaches to learning and creating (captured in *Complexity*), even while supporting their interests. Still, challenges remain. New strategies may be necessary to encourage students to challenge their own values, beliefs, and skills.

References

AAG. (2008). *AifL - Assessment is for learning* Retrieved from http://www.ltscotland.org.uk.assess

Ahmed, W., van der Werf, G., Kuyper, H., & Minnaert, A. (2013). Emotions, self-regulated learning, and achievement in mathematics: A growth curve analysis. *Journal of Educational Psychology, 105*(1), 150-161. doi:10.1037/a0030160

Artino, A. R., & Stephens, J. M. (2009). Academic motivation and self-regulation: A comparative analysis of undergraduate and graduate students learning online. *The Internet and Higher Education, 12*(3), 146-151. Retrieved from http://www.sciencedirect.com/science/article/pii/S1096751609000141 doi:10.1016/j.iheduc.2009.02.001

Azevedo, R., Moos, D. C., Johnson, A. M., & Chauncey, A. D. (2010). Measuring cognitive and metacognitive regulatory processes during hypermedia learning: Issues and challenges. *Educational psychologist, 45*(4), 210-223. doi:10.1080/00461520.2010.515934.

Baird, T. D., Kniola, D. J., Lewis, A. L., & Fowler, S. B. (2015). Pink time: Evidence of self-regulated learning and academic motivation among undergraduate students. *Journal of Geography, 114*(4), 146-157. doi:10.1080/00221341.2014.977334

Bartels, J. M., & Magun-Jackson, S. (2009). Approach–avoidance motivation and metacognitive self-regulation: The role of need for achievement and fear of failure. *Learning and Individual Differences, 19*(4), 459-463. Retrieved from http://www.sciencedirect.com/science/article/pii/S1041608009000284

Biggs, J. B. (1987). *Student approaches to learning and studying. Research monograph*. Washington, DC: ERIC.

Biggs, J. B. (1993). From theory to practice: A cognitive systems approach. *Higher education research and development, 12*(1), 73-85.

Blumberg, P. (2000). Evaluating the evidence that problem-based learners are self-directed learners: A review of the literature. In D. Evensen & C. E. Hmelo (Eds.), *Problem-based learning: A research perspective on learning interactions* (pp. 199-226). Mahway, NJ: Lawrence Erlbaum.

Browman, A. S., & Destin, M. (2016). The effects of a warm or chilly climate toward socioeconomic diversity on academic motivation and self-concept. *Personality and Social Psychology Bulletin, 42*(2), 172-187.

Brown, A., Bransford, J., Ferrara, R., & Campione, J. (1983). Learning, remembering and understanding. In J. H. Flavell & E. M. Markman (Eds.), *Handbook of child psychology: Vol. 3. Cognitive development* (4th ed., pp. 77-166). New York: Wiley.

Carver, C. S., & Scheier, M. F. (1981). Self-consciousness and reactance. *Journal of Research in Personality, 15*(1), 16-29.

Chickering, A. W., & Reisser, L. (1993). *Education and Identity. The Jossey-Bass Higher and Adult Education Series*: Washington, DC: ERIC.

Clark, I. (2012). Formative assessment: Assessment is for self-regulated learning. *Educational Psychology Review, 24*(2), 205-249. doi:10.1007/s10648-011-9191-6

De Castella, K., Byrne, D., & Covington, M. (2013). Unmotivated or motivated to fail? A cross-cultural study of achievement motivation, fear of failure, and student disengagement. *Journal of Educational Psychology, 105*(3), 861.

Deresiewicz, W. (2014). *Excellent sheep*. New York, NY: Free Press.

Dewey, J. (2007 [1938]). *Experience and education*. New York, NY: Simon and Schuster.

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*(3), 231-264. doi:10.1007/s11409-008-9029-x

English, M. C., & Kitsantas, A. (2013). Supporting student self-regulated learning in problem-and project-based learning. *Interdisciplinary journal of problem-based learning, 7*(2), 6.

Ertmer, P. A., & Newby, T. J. (1993). Behaviorism, cognitivism, constructivism: Comparing critical features from an instructional design perspective. *Performance improvement quarterly, 6*(4), 50-72.

Flavell, J. H. (1979). Metacognition and cognitive monitoring: A new area of cognitive–developmental inquiry. *American psychologist, 34*(10), 906.

Graham, C. R., Tripp, T. R., Seawright, L., & Joeckel, G. (2007). Empowering or compelling reluctant participators using audience response systems. *Active Learning in Higher Education, 8*(3), 233-258.

Hacker, D. J., Dunlosky, J., & Graesser, A. C. (2009). *Handbook of metacognition in education*: Abingdon, UK: Routledge.

Hall, R. M., & Sandler, B. R. (1982). The classroom climate: A chilly one for women? Washington, DC: Association of American Colleges. (ED215628)

Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research, 77*(1), 81-112. Retrieved from http://journals.sagepub.com/doi/abs/10.3102/003465430298487

Jang, H., Reeve, J., & Deci, E. L. (2010). Engaging students in learning activities: It is not autonomy support or structure but autonomy support and structure. *Journal of Educational Psychology, 102*(3), 588-600. doi:10.1037/a0019682

Jones, B. D. (2009). Motivating students to engage in learning: The MUSIC Model of Academic Motivation. *International Journal of Teaching and Learning in Higher Education, 21*(2), 272-285.

Kausar, R. (2010). Perceived stress, academic workloads and use of coping strategies by university students. *Journal of Behavioural Sciences, 20*(1), 31.

Kluwe, R. H. (1982). Cognitive knowledge and executive control: Metacognition. In D. Griffin (Ed.), *Animal mind—human mind* (pp. 201-224). New York, NY: Springer.

Lake, D. A. (2001). Student performance and perceptions of a lecture-based course compared with the same course utilizing group discussion. *Physical Therapy, 81*(3), 896-902.

Lee, W. C. A., Bonin, V., Reed, M., Graham, B. J., Hood, G., Glattfelder, K., & Reid, R. C. (2016). Anatomy and function of an excitatory network in the visual cortex. *Nature, 532*(7599), 370.

Liu, N. F., & Littlewood, W. (1997). Why do many students appear reluctant to participate in classroom learning discourse? *System, 25*(3), 371-384.

Machemer, P. L., & Crawford, P. (2007). Student perceptions of active learning in a large cross-disciplinary classroom. *Active Learning in Higher Education, 8*(1), 9-30.

Madjar, N., Kaplan, A., & Weinstock, M. (2011). Clarifying mastery-avoidance goals in high school: Distinguishing between intrapersonal and task-based standards of competence. *Contemporary Educational Psychology, 36*(4), 268-279. Retrieved from http://www.sciencedirect.com/science/article/pii/S0361476X11000099

Madjar, N., Weinstock, M., & Kaplan, A. (2017). Epistemic beliefs and achievement goal orientations: Relations between constructs versus personal profiles. *The*

Journal of Educational Research, 110(1), 32-49. doi:10.1080/00220671.2015.1034353

McCombs, B. L. (1989). Self-regulated learning and academic achievement: A phenomenological view. In B.J. Zimmerman & D. Schunk (Eds.), *Self-regulated learning and academic achievement: Theory, research, and practice* (pp. 51-82). New York, NY: Springer.

Mega, C., Ronconi, L., & De Beni, R. (2014). What makes a good student? How emotions, self-regulated learning, and motivation contribute to academic achievement. *Journal of Educational Psychology, 106*(1), 121-131. doi:10.1037/a0033546

Metcalfe, J., & Shimamura, A. P. (1994). *Metacognition: Knowing about knowing*. Cambridge, MA: MIT press.

Nicol, D. J., & Macfarlane-Dick, D. (2006). Formative assessment and self-regulated learning: a model and seven principles of good feedback practice. *Studies in Higher Education, 31*(2), 199-218. Retrieved from doi:10.1080/03075070600572090

Nilson, L. (2013). *Creating self-regulated learners: Strategies to strengthen students' self-awareness and learning skills*. Sterling, VA: Stylus Publishing, LLC.

Pajares, F. (1996). Self-efficacy beliefs in academic settings. *Review of educational research, 66*(4), 543-578.

Paris, S. G., & Winograd, P. (1990). How metacognition can promote academic learning and instruction. *Dimensions of thinking and cognitive instruction, 1*, 15-51.

Pascarella, E. T., & Terenzini, P. T. (2005). *How college affects students* (Vol. 2). San Francisco, CA: Jossey-Bass.

Pekrun, R., Goetz, T., Titz, W., & Perry, R. P. (2002). Academic emotions in students' self-regulated learning and achievement: A program of qualitative and quantitative research. *Educational psychologist, 37*(2), 91-105. doi:10.1207/S15326985EP3702_4

Pellegrino, J., Chudowsky, N., & Glaser, R. (Eds.) (2001). *Knowing what students know: The science and design of educational assessment*. Washington, DC: National Research Council Division of Behavioral and Social Sciences and Education Committee on the Foundations of Assessment.

Pink, D. H. (2009). *Drive: The surprising truth about what motivates us*. New York, NY: Penguin.

Pintrich, P. R. (1991). *A manual for the use of the Motivated Strategies for Learning Questionnaire (MSLQ)*. Ann Arbor, MI: National Center for Research to Improve Postsecondary Teaching and Learning. (ED338122)

Pintrich, P. R. (1999). The role of motivation in promoting and sustaining self-regulated learning. *International Journal of Educational Research, 31*(6), 459-470. Retrieved from http://www.sciencedirect.com/science/article/pii/S0883035599000154

Pintrich, P. R. (2002). The role of metacognitive knowledge in learning, teaching, and assessing. *Theory Into Practice, 41*(4), 219-225.

Pintrich, P. R. (2003). A motivational science perspective on the role of student motivation in learning and teaching contexts. *Journal of Educational Psychology, 95*(4), 667.

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

Schunk, D., Meece, J., & Pintrich, P. (2014). *Motivation in education: Theory, research, and applications.* Columbus, OH: Pearson.

Schunk, D. H., & Zimmerman, B. J. (2012). *Motivation and self-regulated learning: Theory, research, and applications.* Abingdon, UK: Routledge.

Shim, S., & Ryan, A. (2005). Changes in self-efficacy, challenge avoidance, and intrinsic value in response to grades: The role of achievement goals. *The Journal of Experimental Education, 73*(4), 333-349.

Shoemaker, P. J., Tankard Jr, J. W., & Lasorsa, D. L. (2003). *How to build social science theories*. Newbury Park, CA: Sage Publications.

Siemens, G. (2005). *Connectivism: Learning as network-creation.* Retrieved from http://www.elearnspace.org/Articles/networks.htm

Sierens, E., Vansteenkiste, M., Goossens, L., Soenens, B., & Dochy, F. (2009). The synergistic relationship of perceived autonomy support and structure in the prediction of self-regulated learning. *British Journal of Educational Psychology, 79*(1), 57-68. doi:10.1348/000709908X304398/full

Stefanou, C., Stolk, J. D., Prince, M., Chen, J. C., & Lord, S. M. (2013). Self-regulation and autonomy in problem- and project-based learning environments. *Active Learning in Higher Education, 14*(2), 109-122. doi:10.1177/1469787413481132

Stefanou, C. R., Perencevich, K. C., DiCintio, M., & Turner, J. C. (2004). Supporting autonomy in the classroom: Ways teachers encourage student decision making and ownership. *Educational psychologist, 39*(2), 97-110. doi:10.1207/s15326985ep3902_2

Strange, C. C., & Banning, J. H. (2015). *Designing for learning: Creating campus environments for student success*. Hoboken, NJ: John Wiley & Sons.

Sungur, S., & Tekkaya, C. (2006). Effects of problem-based learning and traditional instruction on self-

regulated learning. *The Journal of Educational Research, 99*(5), 307-320. doi:10.3200/JOER.99.5.307-320

Vygotsky, L. (1978). Interaction between learning and development. *Readings on the Development of Children, 23*(3), 34-41.

Wigfield, A., & Eccles, J. S. (2000). Expectancy–Value theory of achievement motivation. *Contemporary Educational Psychology, 25*(1), 68-81. Retrieved from http://www.sciencedirect.com/science/article/pii/S0361476X99910159

Winne, P. H. (2005). A perspective on state-of-the-art research on self-regulated learning. *Instructional Science, 33*(5), 559-565.

Zatorre, R. J., Fields, R. D., & Johansen-Berg, H. (2012). Plasticity in gray and white: Neuroimaging changes in brain structure during learning. *Nature Neuroscience, 15*(4), 528.

Zimmerman, B. J. (1989). A social cognitive view of self-regulated academic learning. *Journal of Educational Psychology, 81*(3), 329-339.

Zimmerman, B. J. (1990). Self-regulated learning and academic achievement: An overview. *Educational psychologist, 25*(1), 3-17.

Zimmerman, B. J., & Kitsantas, A. (2005). The hidden dimension of personal competence: Self-regulated learning and practice. In A. J. Elliot & C. S. Dweck (Eds.), *Handbook of competence and motivation*. (pp. 509-526) New York, NY: Guilford Press.

TIMOTHY D. BAIRD is an associate professor of human ecology in the Department of Geography and a senior fellow at the Institute for Creativity, Arts, and Technology at Virginia Tech. His research focuses on human-environment interactions, information and communication technologies, and student engagement. He teaches courses on sustainability and contemporary Africa. He has a PhD and an MA in geography from the University of North Carolina and a BA in economics from Bowdoin College.

DAVID J. KNIOLA is a faculty member in the School of Education at Virginia Tech. His teaching and research activities focus on quantitative methods, assessment, and higher education. He has a PhD from Virginia Tech in education leadership and policy studies, an MA in college student personnel from Bowling Green State, and a BS in human resource development from Oakland University.

JOEL HARTTER is an associate professor in the Environmental Studies Program and director of the Masters of the Environment graduate professional program at the University of Colorado Boulder. His research interests include human-environment interactions, land change science, and conservation. He has a PhD in geography from the University of Florida, an MS in forestry from Oregon State University, and a BSE in mechanical engineering and a BS in German from the University of Michigan.

KIMBERLY A. CARLSON is an assistant professor of practice in the Department of Management and the director of the Business Leadership Center in the Pamplin College of Business at Virginia Tech. Her teaching and research experiences include leadership, organizational and workforce development in national and local organizations, governments, and universities. She has a PhD in policy and public administration from Virginia Tech, an MSW in clinical social work from Florida State University, and a BS in psychology and a BA in theatre from Virginia Tech.

DONALD G. RUSSELL is a deputy commandant of cadets in the Virginia Tech Corps of Cadets (VTCC), an all-encompassing military-style leader development program. This role includes coaching, mentoring, and supporting cadets in their leadership and character development, as well as formal classroom lecture. He also oversees the annual VTCC study abroad program. He is a retired United States Air Force officer. He has a master's degree in military operational art and science from Air University, an MA in political science from the University of South Dakota, and a BA in political science from the University of Colorado Boulder.

SARAH ROGERS is a lecturer in the Environmental Studies Program at the University of Colorado Boulder. She teaches courses on natural resources, extractive industries, and renewable energy policy as well as freshman- and junior-level writing. She has also held several staff positions supporting initiatives related to environment, sustainability, and student services. She has an MS in Geology from Northern Arizona University and a BS in Geology from Williams College. And on the side, she helps manage a large-scale family farm.

JOSEPH TISE is a PhD student in educational psychology at Penn State University where he studies self-regulated learning, interest, and motivation. He has a BS in psychology from Virginia Tech.