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REVIEW ARTICLE

Toward an Integrated Model of Student Learning in the College Classroom

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Abstract In the last special issue devoted to this topic, Pintrich (Educ Psychol Rev 16:385–407, 2004) provided an in-depth critique of his conceptual framework on self-regulated learning (SRL), comparing and contrasting it to Biggs' student approaches to learning (SAL) perspective. Since then, there have been a number of advances in the study of learning in higher education. To that end, the purpose of this article is to provide a critical analysis of three distinct yet overlapping streams of research in higher education, namely SRL, patterns of learning (including SAL), and student engagement. The theoretical bases of each of these approaches are outlined followed by a review of recent trends. Finally, an integrative model of student learning is proposed, which draws on the strengths of each of these traditions.

Keywords Self-regulated learning · Motivation · Higher education · Engagement · Patterns of learning

The collective work on student learning in higher education has been informed by several distinct, yet overlapping, strands of research. These include the research on self-regulated learning (SRL; Pintrich and Zusho 2007), patterns of learning (Biggs 1987; Vermunt and Vermetten 2004), as well as the emerging work on student engagement (Coates 2007). Broadly speaking, the psychological research on SRL has uniquely North American roots and despite the common practice of sampling college students, it has not always focused exclusively on issues of higher education. By contrast, the research on learning patterns has a more explicit focus on higher education and grew out of work by European and Australian psychologists (e.g., Biggs 1987; Marton and Säljö 1976; Vermunt and Vermetten 2004). The higher education literature on student engagement, in turn, has been mostly informed by policy-related issues such as declining rates of student engagement and increasing external pressures to substantiate the value of a college education (Coates 2007).

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It is difficult to deny that each of these traditions have contributed knowledge to the higher education literature. For example, in a relatively recent meta-analysis of research in higher education, Richardson et al. (2012) found that "non-cognitive" factors related to personality, motivation, self-regulation, and approaches to learni ng all contributed to explaining the overall variance in tertiary GPA. However, to the extent that these strands of research have been conducted independently by separate communities of researchers, it prevents the integration of knowledge, which is problematic for the advancement of science and may ultimately lessen the practical value of this research. As the editors of this special issue note, the higher education literature is plagued by mixed and/or contradictory findings, which they largely attribute to this lack of integration among research traditions.

Thus, the overarching purpose of this article is to provide a critical analysis of these three major streams of research in higher education, with an eye toward integration. It is important to note that in the last special issue in this journal devoted to this topic, Pintrich (2004) provided an in-depth critique of his conceptual framework on self-regulated learning (SRL), contrasting it mostly to the student approaches to learning (SAL) perspective. He also discussed issues related to the measurement of SRL, focusing primarily on the Motivated Strategies for Learning Questionnaire (MSLQ) and issues of grain-size, more broadly. Since then, however, there have been a number of advances in the study of SRL, as well as the broader research on learning in higher education. Thus, a secondary purpose of this article will be to provide an updated review of the theoretical and empirical research on student learning and to discuss the implications of this body of work for improving the study of learning in higher education.

I begin by first providing a conceptual overview of the research on SRL, which includes a review of the major theoretical assumptions and empirical generalizations that cut across major perspectives of SRL as well as an overview of recent trends. I then provide an overview of the research on patterns of learning, as well as student engagement. This is followed by a critical analysis of these three major perspectives, including an update on some of the claims made previously by Pintrich (2004). Finally, I end with a discussion of a proposed integrative model of student learning, in light of this collective work.

Theory and Research on Self-Regulated Learning in Higher Education

SRL is commonly defined as a constructive process whereby learners proactively monitor, control, and regulate their thoughts, feelings and behaviors to achieve self-set learning goals (Pintrich and Zusho 2007; Zimmerman 2008). Extensive research on SRL suggests that self-regulated learners – students who reflect on their thinking, set appropriate goals and plan for learning, monitor progress towards those goals, and adjust or regulate their thinking, motivation, and study habits – are more likely to achieve academic success than those who do not (Dent and Koenka 2016; Pintrich and Zusho 2007; Zimmerman 2008).

Skills related to SRL are critical for academic success at the postsecondary level, thus increasing the relevance of this theory for higher education (Dörrenbächer and Perels 2016; Zusho and Edwards 2011). College students are often placed in autonomous learning situations (e.g., online learning courses, flipped .classrooms) and are tasked with demanding academic assignments, which necessitate the frequent regulation of their cognition, motivation and study habits. There is too, evidence to suggest that many college students have trouble with these exact skills, as substantiated by the developmental education or "learning to learn" programs common to many college campuses. Zusho and Edwards (2011) go so far as to suggest that

today's college students may be even less self-regulated, pointing to evidence that many students continue to rely on their parents for academic assistance.

Theoretical Bases

As is often the case, there is no single theoretical perspective of SRL. Rather, a number of theoretical perspectives of SRL have been proposed over the years, often reflecting varying conceptions of learning (e.g., information-processing, social-cognitive, sociocultural, situated), and areas of SRL (e.g., cognition, motivation/volition, behavior, affect) (see Zimmerman and Schunk 2001). When it comes to the research on higher education, it can be argued that Pintrich's model of SRL (Pintrich 2000; Pintrich and Zusho 2007) is one of the prevailing theoretical models, especially considering its connection to the Motivated Strategies for Learning Questionnaire (MSLQ) – a popular assessment of college students' cognitive and metacognitive strategy use (Duncan and McKeachie 2005).

Briefly, in line with most other theoretical models of SRL, Pintrich's model specifies four general phases of self-regulation (e.g., forethought/planning/activation, monitoring, control, and reaction/reflection), which can be applied to specific areas of SRL such as cognition, motivation/affect, behavior, and context. Critical to the first phase are task perception and activation of various motivational beliefs associated with the task, as well as goal setting and planning. In the second and third phases, the self-regulated learner is assumed to monitor her attention, understanding, motivation/affect, effort, and behavior and when found wanting, engage strategies to remain on task. The final phase of reaction/reflection occurs after the task has been completed and involves various cognitive judgments and/or affective reactions to the outcome.

Going beyond just the phases and areas of regulation, Pintrich and Zusho (2007) also outlined a general framework of motivation and SRL for the college classroom (see Fig. 1). This model makes a number of important assumptions. First, it assumes that learning outcomes such as choice, effort, persistence, and academic achievement are directly influenced by both motivational and self-regulatory processes. More specifically, in line with the research on motivation and SRL, it largely assumes that students with more adaptive motivational profiles (e.g., higher efficacy beliefs, mastery-oriented goals, interest) will employ deeper-processing cognitive and metacognitive strategies, and as such are more likely to attain higher levels of achievement. This general framework also assumes personal characteristics (e.g., age, gender, ethnicity) and contextual factors (e.g., instructional methods, tasks) to moderate this process.

Empirical Bases

It is important to note that Pintrich and Zusho's general framework of college student learning is based on extensive empirical research, specifically the correlational studies that have dominated the research on SRL and motivation over the past several decades. Collectively, these studies generally find use of deeper-processing cognitive and metacognitive strategies to be related to adaptive motivational profiles. For example, in a sample of college students studying chemistry, Zusho et al. (2003) found moderate correlations between metacognitive strategy-use and motivational constructs such as task value, interest, and mastery goals. This same study also found significant and positive relations between course performance and motivation (e.g., self-efficacy, task-value) as well as use of both surface (e.g., rehearsal) and deeper-processing (e.g., elaboration)

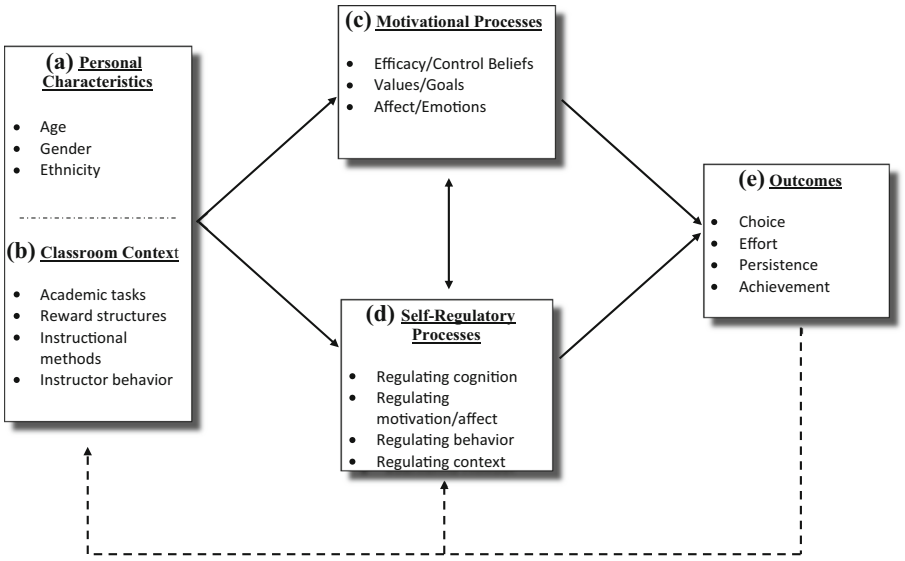

Fig. 1 Pintrich and Zusho's (2007) Model of Student Motivation and Self-Regulated Learning in the College Classroom

cognitive strategies. Such findings are further supplemented by a wealth of other data, albeit on younger students (Dent and Koenka 2016; Pintrich and De Groot 1990). For example, Pintrich and De Groot (1990), in one of the earliest studies examining the link between motivation and SRL, noted moderate to strong correlations between 7th graders' use of metacognitive strategies and their reports of their self-efficacy and mastery goals.

More recently, Dent and Koenka (2016) conducted a meta-analysis of studies of SRL on samples of elementary and secondary students and noted the following trends regarding the relationship between SRL-related constructs and achievement. First, they confirmed that both cognitive and metacognitive processes are significantly correlated with academic performance, although the link between metacognitive processes and achievement is stronger. They state: "while cognitive strategies help students learn, metacognitive processes ensure that they have done so" (p. 459). They further go on to suggest that metacognitive processes such as planning, monitoring and control may be especially critical for success on complex, open-ended tasks. Dent and Koenka's analysis also support the assumption that deeper-processing cognitive strategies are generally more strongly associated with academic performance. That said, rehearsal strategies – often considered the prototypical shallow cognitive strategy – were found to be related positively to academic achievement, paralleling the findings of Zusho et al. (2003).

Dent and Koenka (2016) also identified important moderators of the relations between SRL and achievement. Related to Pintrich and Zusho's framework, the association between SRL and achievement was found to be moderated by factors such as academic subject and age/grade level. In terms of the former, this link was observed to be stronger in social studies than in mathematics, suggesting that factors related to academic task structure and classroom climate may, in part, impact this relationship. As for age, the strength of the relation between metacognitive processes and achievement was found to fluctuate across elementary and secondary grades. Specifically, it was found to be strongest between kindergarten and second grades, strong after the transition to middle school, relatively weak after the transition to high school, only to become stronger again for 11th and 12th graders. Dent and Koenka suggest this

increase for 11th and 12th graders may be a result of increasingly rigorous academic tasks that require skillful and repeated self-regulated learning. Extrapolating these findings for the college context, one could argue that metacognitive processes are likely a critical skill for college students who encounter even more unstructured and demanding tasks.

Recent Trends

Measurement A common assumption linking contemporary models of SRL relates to the dynamic, contingent nature of the learning process (Karabenick and Zusho 2015). For example, Ben-Eliyahu and Bernacki (2015) note that most, if not all, models of SRL generally emphasize the iterative, cyclical nature of the learning process and as such, are "dynamic models in that any activity that occurs within one cycle can affect activities that follow within that cycle, and any activities within subsequent cycles" (p. 3). As highlighted above, there is, too, a trend in the research on SRL to explore the contextual bases of learning; specifically, how regulation varies depending on the situation and tasks that students are asked to complete. Such assumptions are often highlighted in the work on open-ended computer-based learning environments, as well as in studies that explore how students' regulatory processes vary for specific assignments (e.g., classroom assignments vs. multiple choice exams) (Karabenick and Zusho 2015).

Despite widespread agreement among theoretical models of SRL related to these above core assumptions, providing supporting empirical evidence has proven to be challenging. Many blame issues of measurement, which continue to plague the research on SRL (see Dent and Hoyle 2015; Karabenick and Zusho 2015). Specifically, questions have been raised about the accuracy of students' reports when answering *offline* measures of SRL (Winne and Perry 2000), which include common survey measures (e.g., MSLQ) and structured interview protocols (Zimmerman and Martinez-Pons 1986). Veenman (2011), for example, emphasizes how offline measures require learners to pull information from long-term memory retrospectively, making them subject to memory failure, distortion, and interpretive reconstruction. Concerns have also been raised as to the extent to which offline measures can adequately capture the contextual bases of SRL (Winne and Perry 2000). Thus, recent efforts have largely focused on balancing offline measures with more *online* measures that assess SRL in the moment or in "real time". These include measures such as think-alouds, microanalyses, diaries, classroom observations, and computer trace data. (Zimmerman and Schunk 2011).

Although online measures are more consistent with the current conceptualization of SRL as dynamic and context-sensitive, it has complicated the SRL empirical landscape. For one, it has resulted in a proliferation of measures of SRL that exhibit variable relations with each other and with learning outcomes. For example, the correlation between online and offline measures has been found to be, on average, fairly low ($r = .15$, Veenman 2011). Dent and Koenka's analysis (Dent and Koenka 2016) further confirms that online measures of SRL are more strongly related to achievement measures than offline measures. They also found offline measures to be differentially associated with learning outcomes depending upon their operationalization; overall, composite measures of SRL (i.e., measures that collapsed phases of regulation into one scale) displayed higher correlations with achievement than finer-grained measures that assess specific phases of regulation.

Despite their recognized limitations, offline measures have distinct practical advantages over online measures. Whereas online measures often require one-on-one administration, offline measures such as self-reports can be administered to larger groups of students, thus increasing its utility. Many SRL researchers also acknowledge that student perceptions are

critical to understanding regulatory decisions and actions. Even flawed or inaccurate judgments of learning have an impact on behavior, after all. To that end, another trend relates to efforts to improve the context-sensitivity of existing offline measures.

McCardle and Hadwin (2015), for example, developed the Regulation of Learning Questionnaire (RLQ) to better capture the event-based aspects of cognitive regulation, namely how metacognitive processes unfold over time, and vary by specific task contexts. Specifically, they used the RLQ to classify Canadian undergraduates into four distinct profiles (emergent regulators, moderate regulators, high regulators with emergent adapting, and high regulators) based on their responses to the RLQ related to exam preparation. They subsequently compared these profiles with more qualitative diary data, which focused on weekly assignments, from a subsample of students from each profile group. They uncovered varying degrees of overlap across these two sources of data. For example, they noted that a group of students considered to be effective regulators based on the quantitative data often failed to engage appropriate control processes when working on weekly assignments. Taken together their work underscores the importance of assessing SRL over time with multiple sources of data to capture the changing, context-based nature of SRL.

Warming of SRL Research Although research on SRL has always recognized the motivational bases of regulation, relatively more emphasis was placed on the role of self-efficacy – beliefs related to one's perceived ability to attain a course of action – than other motivational constructs. Until recently, only a few models of SRL explicitly considered the full array of motivational and affective constructs in the regulation process, or explored issues related to volitional/motivational regulation (Corno 1993; Pintrich 2000). Increasingly, however, the interplay between students' motivation and their regulation of learning has begun to take center stage in the research on SRL (Schunk and Zimmerman 2008), which has resulted in the further "warming" of SRL research. Indeed, Winne and Baker (2013) went so far as to define SRL as a "behavioral expression of metacognitively guided motivation" (p. 3).

Several studies have documented the link between achievement goals and use of cognitive and metacognitive strategy-use among college students. For example, across two samples of undergraduates enrolled in chemistry and psychology courses, Zusho et al. (2007) found mastery-approach and mastery-avoidance goals to be a significant positive predictor of students' self-reported use of cognitive (i.e., rehearsal, organization, elaboration) and metacognitive strategies. In addition, they found performance-avoidance goals to be related to use of superficial learning strategies.

Wolters and his colleagues have also advanced the research on aspects related to motivational regulation (Wolters and Benzon 2013; Wolters and Hussain 2015; Wolters 1998). First, Wolters and Benzon (2013) expanded the measurement of motivational regulation strategies to include strategies to regulate specific motivational constructs such as value, achievement goals, and situational interest. Using this instrument, they were also able to establish important empirical links between motivation and cognitive regulation among a sample of ethnically diverse college students. For example, they found theoretically consistent relations between motivational beliefs and motivational regulation; specifically, they observed that students who reported higher levels of value, mastery goals, and self-efficacy were also more likely to report using strategies related to motivational regulation. In addition, in line with theory, they also found positive relations between strategies related to motivation and cognitive regulation. Expanding on this research, Wolters and Hussain (2015) also found that one facet of grit – perseverance of effort – was moderately and positively correlated with the use of cognitive, motivational, metacognitive, and time and study management strategies.

Finally, paralleling the research on cognitive regulation, attempts have been made, albeit few in number, to document the dynamic and cyclical nature of the relationship between learners' motivations and their cognitive and metacognitive processes. For example, noting that most correlational studies examining the link between motivation and SRL still measure both as largely stable factors, Bernacki et al. (2015) explored how middle school students' self-efficacy fluctuated over the course of an algebra task. Specifically, they observed that students' reports of their self-efficacy were not stable over the course of the math task; that it was largely influenced by prior problem solving performance and by perceived fluency of problem-solving.

Social Bases & Group Regulation Considerable theory and research have been dedicated to understanding how *social context* influences self-regulatory processes in recent years. Indeed, a growing area of the interest among researchers of SRL relates to the social bases of learning (Hadwin and Järvelä 2011; Schoor et al. 2015), which recognizes that SRL can occur not just in individual learning but also during cooperative and collaborative group learning. This research makes a distinction between "I", "you", and "we" perspectives of regulation, noting that regulation can occur with regard to one's own goals ("I" perspective), to another person's goals ("you" perspective), or to shared group goals ("we" perspective) (Schoor et al. 2015). Schoor et al. further suggest that when working with others, the cognitive architecture of regulation – what Winne and Hadwin (1998) refer to as conditions, operations, products, evaluations and standards – can be shared or unshared, which can provide a framework for understanding how regulation is impacted by interaction with others.

Karabenick and Zusho (2015) further point to the research examining the link between help seeking and SRL as another example of the social bases of learning. As Zusho et al. (2007) note, help seeking is both a behavioral SRL strategy as well as a social-interactive process with self-relevant implications not shared by other forms of self-regulations, including risks to self-worth related to the negative (at least from a Western perspective) association of help seeking with dependency. The collective body of research on help seeking at the college level suggests an important distinction related to seeking help – namely whether the learner seeks help when needed. Overall, this work suggests not only that college students tend to underutilize academic support services, but also that students who seek help when needed are more likely to self-regulate their learning in other ways (Karabenick and Knapp 1991; Zusho et al. 2007).

CBLEs and SRL It is difficult to deny that information and computer technologies are transforming the college landscape in significant ways. From PowerPoint presentations to interactive software, from flipped classrooms to wholly online learning environments, the use of technology is becoming increasingly evident in the college classroom. Research on such computer-based learning environments (CBLEs) further suggest that the use of self-regulatory strategies is paramount in such ill-structured, open-ended environments (Azevedo and Cromley 2004). Thus, in line with the focus on contextual bases of learning, increasing attention is being paid to how such learning environments impact the ways in which students regulate their learning (Kitsantas et al. 2015).

Specifically, attention is being paid to how learning technologies can be used to increase college students' regulation of learning in online learning environments. Overall, this work suggests that students generally achieve more when technologies (e.g., electronic feedback) are used to support students' self-regulation, motivation, and engagement (Kitsantas et al. 2015). That said, questions remain as to what types of feedback and self-regulatory prompts are most effective. For example, simple email messages reminding college students to self-regulate have proven to be largely ineffective, whereas SRL training provided by specific digital learning

platforms has been shown to increase college students' achievement (Azevedo and Cromley 2004).

Summary

Taken together, the following conclusions can be drawn about the current state of the literature on SRL. Theoretically, this body of work assumes that students who actively regulate their cognition, motivation, behavior, and context are more likely to achieve academic success than those who are more passive. Second, models of SRL assume regulation to be a dynamic, iterative, metacognitively and motivated process that changes over time, academic contexts, and tasks. Third, SRL is assumed to be amenable to intervention and that students are more likely to regulate when they are prompted (either directly or indirectly by others or technology) to do so.

To better capture the dynamic and changing nature of regulation, recent empirical research has focused mainly on improving alignment of methods to theory. A variety of online measures now complement offline measures. Improvements have also been made to offline measures, including the adaptation of survey items to specific learning contexts as well as the expansion of constructs assessing motivational regulation. There is, too, growing interest in understanding the social bases of regulation, as well as how ill-structured learning environments such as CBLEs impact the regulation of learning. Overall, this work highlights the increasing focus of SRL on the contextual, event-related bases of regulation.

Patterns of Learning

In addition to SRL, the research on higher education has also been influenced by the collective work on patterns of learning, which include the student approaches to learning (SAL) perspective, as well as the broader research on learning styles and learning patterns (Donche and Gijbels 2013; see also Vermunt & Donche, this issue). Donche and Gijbels (2013) refer to this shared body of work as primarily focused on students' "*habitual* ways of learning" (emphasis added), specifically as it relates to how students process information cognitively, as well as the metacognitive and motivational strategies they employ.

Theoretical Bases

Biggs (1987) is often credited with building the theoretical foundations for the research on patterns of learning. Specifically, extending the qualitative research conducted by Marton and Säljö (1976), Biggs identified three main approaches (or patterns) of learning that he thought to be prevalent among college students: a surface approach guided by an instrumental motive to meet minimal academic requirements and use of rote memorization strategies; a deeper approach directed by a motive to actualize interest and/or competence and use of elaborative strategies; and an achieving approach based in a motive of competition and ego enhancement and use of organizational strategies. He also developed the presage process product (PPP) model of general learning, which emphasized the adaptive role of a deep approach to learning and explicated how these processes are guided by both personal and situational factors.

As Vermunt and Vermetten (2004) noted, much of the earlier work on patterns of learning considered only the intersection of cognitive strategy-use and motivation, and failed to acknowledge regulatory aspects of learning. Thus, they distinguished these studies from the next generation of research on learning patterns, which more explicitly recognized the research on metacognitive regulation alongside cognitive and motivational components of learning. More specifically, in line with the research on metacognition (e.g., Flavell 1979) as well as the original research on SAL and conceptions of learning (e.g., Entwistle and Ramsden 1983; Marton and Säljö 1976; Pask 1976) Vermunt and Vermetten (2004) developed a model of "*learning styles*" that distinguished between cognitive, affective, and regulation activities.

Briefly, they defined cognitive processing activities as those activities that students use to process content, akin to what SRL researchers would likely call cognitive strategy-use. They defined affective activities as those activities that "involve emotions that arise during learning and lead to affective states that may positively, neutrally, or negatively influence the progress of a learning process" (p. 361), including activities related to motivational regulation such as self-consequating and effort regulation, as well as more general motivation-related activities such as assigning value to tasks or making causal attributions. Finally, they defined regulatory activities as those related to planning, monitoring, and controlling aspects of learning.

Extending the work on SAL, they established three distinct profiles of cognitive processing: a) a deep processing strategy, which includes activities such as "relating", "structuring", and "memorizing"; b) a stepwise processing strategy, which consists of activities related to "analyzing" and "memorizing"; and c) a concrete processing strategy, which focuses on "concretizing" and "applying". Similarly, they identified three main regulatory strategies: a) a self-regulated strategy where students regulate their own learning successfully without any external aids; b) an externally-regulated strategy, whereby students are more other-regulated than self-regulated and; c) a lack of regulation, which occurs when students are unable to regulate their own learning and are not supported externally to regulate.

In addition to cognitive/affective processing and regulatory strategies, Vermunt and Vermetten (2004) consider conceptions of learning and learning orientations as important components of learning styles. They define conceptions of learning in terms of metacognitive and strategic knowledge, as well as knowledge about learning objectives and tasks. By contrast, they define learning orientations more in terms of the motives behind studying, for example for studying for interest or for professional gain. Thus, to summarize, Vermunt and Vermetten's model of learning styles extends the research on SAL to consider five components of learning styles: regulatory strategies, conceptions of learning, learning orientations, as well as the cognitive and motivational strategies that was originally outlined in Biggs' model.

Recent Trends

In line with the work on SRL, the contemporary research on learning patterns appear to be guided by two inter-related goals: a) to better understand the contextual and personal determinants of learning patterns and; b) to improve measurement (Donche and Gijbels 2013). Specifically, there is growing interest in understanding how patterns of learning vary according to time, context, and assessment practices, as well as by specific personal characteristics. There is, too, growing recognition of the variability that exists in the operationalization of learning

patterns across studies, as well as increasing calls for multiple data sources (Donche and Gijbels 2013).

First, in terms of context differences, several studies have documented how factors such as academic discipline and instructional practices impact patterns of learning. Baeten et al. (2010), for example, found that deeper learning patterns were more common in the behavioral sciences, and generally among those with instructors who encouraged deeper approaches to learning. However, contrary to the general assumption that student-centered learning environments would be more promotive of a deeper approach to learning, these same researchers found in a follow-up study that college students are generally not likely to employ deep approaches to learning and what is more, that their reports of deep learning decline over the course of a semester (Baeten et al. 2013). They also found that, contrary to expectations, students who were being assessed using a portfolio or peer-based system reported an increase in surface approaches to learning compared to students who were assessed using more traditional multiple choice exams. The researchers largely attributed these somewhat puzzling findings to the lack of structure that was often present in more student-centered learning environments. They reasoned that the high workload coupled with lack of feedback most likely prompted unorganized students to adopt a surface approach to learning.

Similarly, Loyens et al. (2013) investigated patterns of learning in problem-based learning environments and found that overall, surface learning approaches were more common than deeper approaches to learning. However, they also observed that variables such as self-study time and professionalism (i.e., being prepared in study groups) mediated the relationship between approaches to learning and achievement outcomes.

Second, there continues to be interest in understanding the personal bases of specific patterns of learning. Specifically, variables related to both motivation and personality have been shown to impact students' patterns of learning. Baeten et al. (2010) found, for example, that a deep approach to learning was more prevalent among students who reported greater satisfaction with the course and higher levels of self-efficacy, as well as among students with personality characteristics like openness to experience, extraversion, conscientiousness, agreeability, and emotional stability. Correspondingly, De Clercq et al. (2013) confirmed mastery-approach goals to be predictive of aspects related to deep approach to learning (e.g., use of deeper-processing cognitive strategies, and regulatory aspects of learning). More recently, Coertjens et al. (2016) noted a relationship between approaches to learning and motivational variables such as perceived course interest and relevance.

Third, paralleling the research on SRL, issues of measurement and analysis are being raised with added frequency. Richardson (2013), for example, notes that researchers interested in assessing patterns of learning have no shortage of survey instruments to choose from, including the Inventory of Learning Styles (ILS, Vermunt and Vermetten 2004), the Approaches to Learning and Studying Inventory (ALSI, Entwistle et al. 2003), the Revised Two-Factor Study Process Questionnaire (Biggs et al. 2001) among others. As is evident, survey instruments continue to be the primary *modus operandi* for research on patterns of learning. It is also important to note that certain questionnaires are better aligned with specific models of learning patterns. For example, the ILS corresponds to Vermunt and Vermetten's (2004) framework, whereas the Revised Two-Factor SPQ is better aligned with Biggs' model. Richardson (2013) also notes the increasing sophistication of data analytic strategies being employed by researchers, and how this variability might impact interpretation of these data.

Summary

In short, the collective research on patterns of learning aims to better understand college students' customary habits of learning, and how those approaches or styles of learning relate to important achievement outcomes. The first generation of research (guided by Biggs' framework) focused mainly on understanding how deep, surface, and achieving approaches to learning – operationalized in terms of cognitive strategy-use and motives – were associated with learning outcomes, and typically found that students who employed a deeper approach to learning were more likely to report better learning outcomes. The second generation of research on learning patterns – in line with Vermunt and Vermetten's framework of learning styles – expanded the operationalization of learning patterns (or styles) to include regulatory strategies, as well as beliefs about and orientations toward learning.

Whereas the first generation of research mostly sought to confirm the positive association between deeper patterns of learning and achievement, the second generation of research has focused more on understanding under what circumstances those relations can be found. In other words, it has centered on exploring the personal and contextual moderators of this relationship. Overall, this work suggests that it is often difficult to encourage students to adopt deep patterns of learning, even in constructive learning environments, which theoretically should be more facilitative of such patterns of learning (see also Asikainen & Gijbels, this issue). Finally, there is variability in how researchers operationalize learning patterns, considering the plethora of instruments available; what is consistent, however, is researchers' reliance on survey instruments to assess patterns of learning.

Student Engagement

Apart from SAL and SRL, another perspective that has become increasingly popular in the higher education literature is that of student engagement (Coates 2007; Christenson et al. 2012). There appear to be two main tracks of research on student engagement: a) mostly psychological research, which focuses on characteristics of schools and schooling that promote and/or impede high school students' cognitive, affective, and behavioral engagement (Christenson et al. 2012; Fredricks et al. 2004), and; b) research on engagement in higher education, spurred in part by declining rates of student engagement and increasing external pressures to substantiate the value of a college education (Coates 2007). Given the focus of this special issue on higher education, I will concentrate mostly on reviewing studies framed according to the latter track, which defines student engagement as a broad construct that outlines the academic and non-academic "activities and conditions linked with effective learning" (Coates 2007, p. 122). Having said that, however, it is important to note that there is a sizable and growing literature on the former stream of research; thus, I will pull from this work when necessary.

Theoretical and Practical Bases

As McCormick et al. (2013) note, student engagement is a multifaceted construct that draws from several fields of study, including psychology, sociology, cognitive development, theories of learning, and the broader literature on the impact of college. To that end, a number of

theoretical frameworks have been aligned with the research on student engagement, including Pace's work on student effort, Tinto's model of academic and social integration, and Astin's student involvement theory. I will briefly describe each of these frameworks below.

Pace (1980, 1998) was instrumental in documenting the link between college success and the "quality of effort" students put into taking advantage of the facilities and all the other opportunities colleges offer. He defined and operationalized "student effort" primarily in terms of meaningful academic engagement, as indicated by the amount of time and effort students placed in studying, interacting with peers and faculty, and applying what they learned to concrete situations. Astin (1984) is also credited with influencing the conceptual development of the student engagement construct. Whereas Pace defined engagement mostly in terms of effort, Astin's (1984) operationalized engagement as "involvement", or the extent to which students participated in academic, social, and extracurricular activities.

In addition, the contemporary research on college student engagement is often framed according to Tinto's (1987, 1993) model, which suggests that college dropout and/or persistence is mostly a function of a student's degree of academic and social integration. Indicators of academic integration include academic performance, identification with established academic norms, as well as compliance with the policies and requirements of the institution. Social integration, in turn, relates to involvement in extracurricular activities and a student's perception of the quality of their interaction with peers, faculty, and staff. Tinto's model is often referred to as an interactionist model in that it is essentially a theory of person-environment fit. For example, it suggests that student dropout can be explained by the interaction between student and institutional characteristics.

Apart from its theoretical foundations, a comment is warranted about the impetus of research on student engagement in higher education. McCormick and his colleagues (McCormick et al. 2013) point to the National Education Goals, and the growing dissatisfaction with "college quality" being equated with *U.S. News and World Report* rankings as major catalysts for the research on student engagement. Specifically, the National Education Goals were influential in that it re-focused the American discourse on process indicators of "good practices" in higher education, ostensibly indicators akin to student engagement. Second, they noted that the dialogue on college quality was turning more and more to how colleges were being ranked according to the *U.S. News and World Report* poll, which relied more on wealth- and selectivity-based indicators than those related to teaching and learning.

These developments led to the identification of various "principles for good practice in undergraduate education", and ultimately resulted in the development of the National Survey of Student Engagement (NSSE). Developed by a team of American-based researchers, the NSSE was launched in 2000, and has since been used by over 1,500 U.S. and Canadian institutions of higher learning to identify patterns in undergraduate students' time-use and to further understand the benefits of attending college (NSSE, n.d.). There are, too, an Australian (Australian Survey of Student Engagement - AUSSE, Coates 2010) and Chinese (Chinese College Student Survey – CCSS, Luo 2015) versions of the NSSE. In fact, the use of the CCSS has grown considerably in recent years and is now used more than both of the Western versions combined (Luo 2015).

More specifically, the NSSE, which was revised in 2013, has questions related to five main benchmark areas of student engagement: a) level of academic challenge, b) active and collaborative learning; c) quality and quantity of student-faculty interactions; d) enriching educational experiences; and e) supportive campus/learning climate (Coates 2010; Fuller et al. 2011; NSSE n.d.). The AUSSE has one additional category, that is work integrated learning,

which assesses the integration of employment-focused work experiences into students' course of study (Coates 2010). Thus, despite its theoretical foundations in the work of Astin, Pace, and Tinto, it could be argued that the conceptualization of the engagement construct has been influenced significantly by its empirical operationalization.

Recent Trends

Research on student engagement is arguably in its infancy, considering that most of the large-scale empirical work has been conducted within the last decade and has focused on data using the NSSE and its international counterparts. Given its relatively recent history, it may not be surprising to find that there is still considerable discussion concerning the conceptualization and assessment of the student engagement construct. Despite its theoretical bases, it is not uncommon to find criticisms of the engagement construct as "weakly theorized" (Khan 2014).

Both Kahu (2013) and Zepke (2014) note the variability in how student engagement is understood by researchers. Kahu (2013), for example, differentiates between four main perspectives of student engagement. First, there is the behavioral perspective, popular among those who predominantly rely on the NSSE and its daughter surveys, which defines engagement according to the aforementioned benchmark areas related to the roles of students, teachers, and institutions in student learning. Second, there is the psychological perspective of engagement – common in the school literature mentioned at the beginning of this section – which, conceptualizes student engagement as a blended construct of behavioral, cognitive, and affective components (Fredricks et al. 2004). According to this perspective, engagement is considered to be more than time on task (behavioral engagement); it also relates to the extent to which students value and are interested in academic tasks (affective engagement), as well as the extent to which such tasks promote strategic, "minds-on" (cognitive) engagement. Third, there is the sociocultural perspective, which is more focused on identifying how broader societal forces impact student engagement. Fourth, there is the holistic approach, which conceptualizes engagement as a situated, dynamic process that varies as a function of context that is better captured through in-depth qualitative approaches.

In considering these four perspectives, Kahu (2013) observes that the behavioral perspective prioritizes the behavioral aspect of engagement over other important indicators related to cognition and affect. Both the psychological and holistic approaches, in comparison, present a more balanced approach; however, they can be criticized in that they do not clearly differentiate among the three aspects of engagement, and between the antecedents (and I would add consequences) of engagement. To address these shortcomings, Kahu presents her own conceptual framework of engagement. In line with the psychological perspective, Kahu defines engagement in terms of affect, cognition, and behavior. In addition, her model clearly lays out specific antecedents and consequences of engagement. In terms of antecedents, she distinguishes between distal structural features (e.g., university-related policies, curriculum, student background) from more proximal psychosocial factors (e.g., variables associated with the quality and quantity of student-faculty relationships. As for consequences, she makes a distinction between proximal and distal academic and social outcomes. Proximal consequences include academic outcomes such as indices of learning and achievement, and social outcomes such as satisfaction and well-being; whereas distal outcomes include academic outcomes such as a disposition toward lifelong learning and social outcomes such as citizenship and personal growth. Kahu's entire model, it should be noted, is also couched in terms of

sociocultural influences – a core assumption of this model is that this process of student engagement must be considered in terms of sociopolitical climate concerning issues of culture, power, policy, and economics. Indeed, Zepke (2014) suggests that the overarching student engagement paradigm largely conforms to neoliberal ideologies, considering its emphasis on markers of student success and accountability.

Although consensus has yet to be reached about the conceptualization and operationalization of the engagement construct, there does appear to be growing appreciation of more comprehensive models of student engagement, such as that of Kahu. Zepke (2014), for example, concludes that "the fusion of behavioural, emotional and cognitive engagement indicators with multiple facilitators of engagement offers a useful framework for thinking about student engagement" (p. 698).

Summary

In comparison to the work on SRL and SAL, research on student engagement is relatively new, and draws from multiple disciplines beyond psychology. Accordingly, there appears to be less consensus on the theoretical conceptualization of the engagement construct. To the extent that the majority of studies to date has focused on using the NSSE, AUSSE, and the CSSE, a behavioral model of engagement is more prevalent in the overall literature; however, this approach has come under some scrutiny. Specifically, there are now calls to consider affective and cognitive indicators of engagement alongside strictly behavioral ones, and to identify important antecedents and consequences of engagement. Kahu's (Kahu 2013) model of student engagement was presented as one such comprehensive model of student engagement.

Toward an Integrated Model of Learning

To this point, I have reviewed the theory and research on three influential models of student learning in the higher education literature, namely self-regulated learning, patterns of learning, and student engagement. In this section, I provide a critical analysis of each of these approaches, highlighting their similarities and differences. Then, drawing from the strengths of each of these traditions, I conclude with an integrative model of student learning.

Critical Analysis

In looking across the three approaches, one can identify a number of cross-cutting themes. These include assumptions about the nature of learning, the personal and contextual influences on the learning process, the interaction between cognition and motivation/affect, as well as issues related to measurement. I review each of these aspects below in turn.

First concerning the nature of learning, all three models share the active learning assumption –that students are active participants in the learning process. From the SRL perspective, the adaptive learner is the self-regulated learner – the strategic, conscientious, and motivated learner who systematically and appropriately employs an arsenal of cognitive, motivational, and metacognitive strategies; the learner who knows when she knows something and when she does not, and proactively seeks help when needed. From the SAL perspective, the adaptive

learner is the deep learner – the actualized learner who is motivated to develop competence and who employs elaborative strategies associated with meaningful learning. Finally, from the student engagement perspective, the adaptive learner is the engaged learner – the learner who is motivated by academic challenge, who engages in active and collaborative learning, and who takes advantage of all that college has to offer (Coates 2007).

All three perspectives also share in the general assumption that the learning process is influenced by both personal and contextual factors, albeit to varying degrees. For example, models of SRL and patterns of learning assume that learners construct meaning through both external and internal cues and processes. Indeed, Pintrich and Zusho's (2007) model of motivation and SRL (see Fig. 1) is very similar in structure to Biggs' 3P model. For example, both models specify both contextual (e.g., factors related to teacher practice and classroom environment) and personal (e.g., factors related to the person such as age, gender, personality) antecedents (or 'presage' according to Biggs' 3P model) of the learning process. Correspondingly, models of student engagement also recognize that student learning is influenced by both individual and contextual features, although this relation is perhaps not always as clearly defined as in models of SRL or SAL (cf., Kahu 2013). For example, the NSSE and AUSSE measures both personal factors (e.g., students' perceptions of academic challenge and use of active and collaborative learning) and contextual factors (e.g., peer-faculty interactions, supportive learning climate) as indicators of engagement.

The three frameworks also all recognize that when it comes to learning outcomes, it is not enough to simply focus on variables related to cognition *or* affect. Rather, both skill and will are necessary for achievement (Zusho et al. 2003). This assumption is reflected in the recent research on SRL, which has placed more emphasis on how motivational constructs related to competence (e.g., self-efficacy) and meaningfulness (e.g., value, achievement goals, interest) interact with regulatory processes. Similarly, research on patterns of learning have begun to document the interrelations between deep approaches to learning and a variety of motivational constructs such as achievement goals, self-efficacy, and interest.

Likewise, the psychological perspective of student engagement defines engagement as an amalgam of behavior, cognition, and affect. Incidentally, several researchers have noted the conceptual overlap of the engagement construct with the research on SRL and motivation. Wolters and Taylor (2012), for example, note that "there is little practical difference between what researchers studying student engagement describe as high levels of cognitive engagement and what others identify as the cognitive aspects of self-regulated learning" (p. 641). Similarly, Eccles and Wang (2012) observed that the line between engagement and motivation becomes blurriest when engagement is defined primarily in terms of affective engagement (e.g., liking or valuing of school).

Finally, the three perspectives share a goal of improving measurement. Among researchers of SRL, there is a clear desire to better capture the dynamic, context- and time-sensitive nature of regulation. To that end, revisions are being made to survey instruments of SRL, and a variety of online assessments now complement pre-existing, survey-based, aptitude measures. As for the research on patterns of learning, despite its phenomelogical roots, survey methodology still prevails, although concerns have been raised about the numerous instruments available to assess learning patterns. In terms of the research on student engagement, survey methods are relatively more common, particularly among mainstream researchers who rely on the NSSE and its variants to assess engagement. Nevertheless, these measures have not escaped criticism. Echoing some of the criticisms made of aptitude measures of SRL, some researchers have observed that a single survey instrument of behavioral engagement is unlikely

to capture the variability that exists across disciplines (Kahu 2013). Proponents of the sociocultural and holistic perspectives of engagement, therefore, point to the utility of longitudinal, qualitative methods.

As is evident from the above analysis, there is a fair amount of overlap across these three streams of research. However, there are significant areas of divergence that are also important to note. In comparing the SAL and SRL perspectives in his original analysis, Pintrich (2004) made frequent references to differences in grain size between these frameworks. I would argue that issues of grain size are still pertinent, perhaps to an even greater extent, when analyzing the higher education literature on student learning.

Although researchers of SRL, learning patterns, and student engagement all recognize the contextual bases of learning, one could argue that researchers of SRL, particularly those who espouse an event-based perspective, are relatively more motivated to understand how regulatory processes vary over time and across academic tasks than proponents of the other two approaches. Indeed, issues of context (i.e., interaction between learner and learning environment), contingencies (i.e., instances where SRL events occur in relation to another, for example how monitoring and control affect each other), and dynamic relations (i.e., relates to the iterative cyclical nature of SRL) continue to be emphasized as core issues in the research on SRL (Ben-Eliyahu and Bernacki 2015). This focus is also reflected in the rise of online measures of SRL.

In comparison, the collective research on patterns of learning share a goal of documenting college students' *habitual* patterns of learning. It stands to reason, then, that this research stream would be more concerned with understanding how these habits change at broader contextual levels than perhaps researchers of SRL. A good example would be the current trend exploring the alignment (or lack thereof) between student-centered learning environments and deep approaches to learning. Whereas SRL researchers would probably be more focused on understanding how specific student-centered tasks influence students' regulatory processes, researchers of learning patterns have mostly focused on examining student-centered environments at a more global level.

Researchers of SRL also make finer distinctions when it comes to the conceptualization and operationalization of cognition and motivation. In terms of cognition, researchers of SRL consider both cognitive strategy-use, as well as the strategies and tactics related to planning, monitoring, controlling, and evaluation of cognition. Similarly, in terms of motivation, drawing from the expansive research on achievement motivation (Maehr and Zusho 2009), researchers of SRL typically distinguish between motivational constructs such as autonomy, belonging, competence, and meaningfulness (Turner 2014) and examine how these various constructs interact with cognitive and metacognitive strategy-use, as well as predict learning outcomes. Unlike some perspectives of SAL, research on SRL also does not presuppose a one-to-one correspondence between certain types of cognitive strategy-use and motives.

At least in comparison to the overarching research on student engagement, theoretical models of SRL also make sharper distinctions between the antecedents and consequences of motivational and regulatory processes. In terms of consequences, models of SRL typically assume that motivational, cognitive, and metacognitive processes are related yet distinct constructs that are predictive of learning outcomes, including indices of behavioral engagement. Pintrich and Zusho (2007), for example, suggest that motivational and self-regulatory processes can be used to explain differences in behavioral engagement, such as whether students choose a particular course of study, how much effort they put into their school work, and how long they persist (e.g., time-on-task). Thus, unlike the work on student engagement,

models of SRL typically differentiate between cognition, affect, and behavior; moreover, it assumes motivational and self-regulatory processes to be predictive of (and not a part of) behavioral engagement.

Similarly, in terms of antecedents, models of SRL and patterns of learning almost always highlight specific antecedents that may moderate the relations between regulatory processes/patterns of learning and indices of achievement, whereas only some models of engagement do so. These include variables associated with the learner, as well as more malleable variables associated with instructional practices and classroom climate. It could also be said that the research on patterns of learning, given its goal in understanding college students' habitual learning patterns, perhaps place more emphasis on identifying stable antecedents (e.g., personality) than the overall research on SRL (Vermetten et al. 2001).

That said, it is important to recognize the variability that exists across models of student engagement. Indeed, certain models do an excellent job of making clear distinctions between antecedents and consequences of engagement. Some, like Kahu's (Kahu 2013) model, even differentiate between proximal and distal antecedents and outcomes, and explicitly recognize the sociopolitical influences that shape university policies. Models of engagement, also unlike the overall research on SRL or patterns of learning, recognize both academic and social outcomes. Thus, in some ways, one could argue that the engagement literature takes a more holistic approach than the work on SRL or patterns of learning.

Toward Integration

To this point, I have noted both the similarities and differences across models of SRL, patterns of learning, and engagement. Although there are theoretical assumptions that distinguish each of these perspectives from each other, it is not insurmountable to develop a more integrative model of student learning that takes into consideration the strengths of each of these approaches. Indeed, Wolters and Taylor (2012) noted how common it is to find researchers of one framework to invoke terminology or ideas that is central to another. Researchers of SRL often distinguish between deeper- and shallow-processing cognitive strategies and often describe the self-regulated learner as one who is cognitively, motivationally, and behaviorally engaged. Likewise, researchers of patterns of learning now explicitly consider regulatory processes as an important component of learning styles, and models of student engagement often point to self-regulation as a critical component of engagement. This collective body of work also implicate similar antecedents of student learning, and are generally interested in explaining the same learning outcomes. This would suggest, then, that these models of student learning should be linked, both theoretically and practically (Wolters and Taylor 2012).

To that end, I conclude with my own integrative model of student learning, which in some ways can be considered an update to Pintrich and Zusho's (2007) general framework of college student learning discussed earlier (See Fig. 2). As is evident, this model draws heavily from the research on SRL and attempts to illustrate the situated and dynamic interrelations between motivational and regulatory processes; however, it also considers variables that are considered important to the other frameworks of learning.

Like Fig. 1, Fig. 2 generally outlines the antecedents and outcomes of learning. Specifically, it seeks to explain important cognitive outcomes of learning, such as deep understanding of content material and academic achievement, as well as behavioral outcomes such as academic risk-taking and indices of behavioral engagement such as effort, choice, and persistence. Thus,

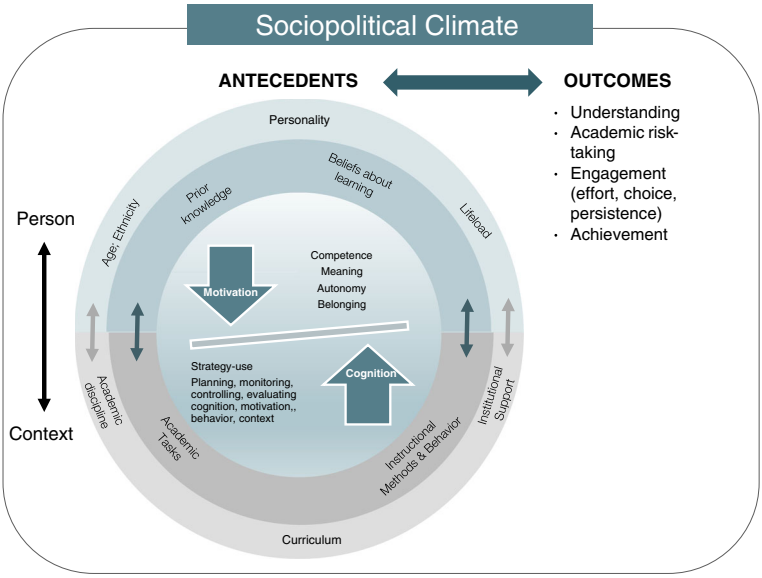

Fig. 2 An Integrative Model of Learning in the College Classroom

unlike most models of student engagement, this model of student learning differentiates motivation and cognition from behavior. It also focuses more on academic outcomes, rather than the social outcomes outlined in some models of student engagement (e.g. satisfaction, well-being, and personal growth). Although models of SRL are increasingly recognizing the social bases of learning, there is at present little to no empirical research to suggest that they are linked to such outcomes. Thus, for now, this model is limited to explaining academic outcomes. That said, an important area of future research would be to explore how these mostly academic variables ultimately can explain social outcomes, as well as more distal academic outcomes such as lifelong learning.

In terms of antecedents, in line with Pintrich's model of SRL, at the heart of the model is the interaction between motivation and cognition, specifically: a) motivational constructs related to competence (e.g., self-efficacy), meaningfulness (e.g., value, achievement goals, interest), autonomy, and belonging, and; b) use of cognitive strategies (e.g., elaboration, rehearsal, organization) and strategies related to regulation (planning, monitoring, control, and evaluation) of cognition, motivation, behavior, and context. I assume that these motivational and cognitive processes are influenced by both personal (depicted on the top side of the model) and contextual (depicted on the bottom side of the model) factors, which in line with Kahu's (Kahu 2013) model can be broken up into more proximal and distal factors. Rather than depict this interaction linearly (as we did in Fig. 1), the updated model takes a more situated, ecological approach, by depicting how motivational and regulatory processes are situated in both the person and in context at varying levels of influence. The model also recognizes that this interaction between the antecedent and outcome variables are embedded in a particular sociopolitical context.

In terms of more proximal influences, I consider contextual factors such as academic tasks, which can vary in content, level of difficulty, structure (i.e., extent to which the task is defined or open-ended), and the extent to which it supports students' use of SRL (with or without the

use of technology). Similarly, instructional methods can vary; for example, in terms of how much an instructor supports students' autonomy, or engages in collaborative or group learning. On the more personal end, research consistently demonstrates the impact of prior knowledge on subsequent learning. For example, Alexander's (1997, 2004) model of domain learning (MDL) specifies an interaction between knowledge (both subject matter and topical knowledge) and depth of strategic processing (see also Dinsmore, this issue). Similarly, there is evidence to suggest (as highlighted by the work on patterns of learning and epistemic beliefs) that students' beliefs about learning can be important moderators of the relationship between motivation, cognition, and learning outcomes (Hofer and Pintrich 1997; Muis and Franco 2009; Muis et al. 2015). The arrow between these more immediate personal and contextual factors also recognizes that these factors do not work in isolation but can interact with each other in important ways. Indeed, Kahu (2013) notes the important interrelationship between students and teachers; specifically, she suggests that engagement largely depends on what teachers and students do *together*.

As for distal influences, I consider personal characteristics such as age, ethnicity, personality (e.g., Big 5) as well as "lifeload"(or "the sum of all of the pressures a student has in her life", Kahu 2013, p. 767) and contextual factors related to curriculum, and degree of institutional support. Although I believe that these factors certainly play a role in the learning process, I assume that that they exert their influence primarily through the proximal factors listed above. In addition, in line with Pintrich and Zusho (2007), this model also largely assumes motivational and regulatory processes to mediate the relationship between these personal and contextual factors and learning outcomes.

Taken together, this integrative model makes the following assumptions about learning. First, it assumes that students with adaptive motivational profiles are more likely to report using self-regulatory and cognitive strategies, which in turn should lead them to report enhanced learning outcomes, including engagement. To that end, unlike certain models of engagement, this model assumes motivation and cognition to be antecedents of behavioral engagement. Second, it assumes that this interaction between motivation and cognition is influenced by both personal and contextual factors; and that it is possible to identify more proximal and distal influences on learning. A core assumption is that personal factors such as prior knowledge and beliefs about learning and contextual factors such as tasks and instructional methods have a more direct influence on motivational and regulatory processes than more distal factors such as personality/disposition and academic discipline. Finally, in line with the research on SRL and reflected by the recursive arrows, this model also assumes that the learning process is cyclical, contingent, and dynamic: cyclical in that an activity that occurs within one cycle can affect activities that follow within that cycle; contingent in that events within one cycle are contingent upon prior cycles (i.e., prior knowledge and prior outcomes affecting subsequent processes); and dynamic to the extent that it recognizes that it is possible for two or more motivational and SRL processes to influence one another (Ben-Eliyahu and Bernacki 2015).

Conclusion

The research on higher education is clearly at a cross roads. Despite a common interest in understanding the factors underlying college academic success, the collective research to date has been conducted by separate (often geographically-bound) groups. In this paper, I reviewed

three such research streams, specifically the work on SRL, patterns of learning, and student engagement. Across these corresponding research traditions, I presented substantial areas of convergence. Specifically, I outlined how these three perspectives share assumptions related to active learning, the interacting effect of motivational and cognitive processes on learning, and the personal and contextual bases of learning. Heavily influenced by the research on SRL but also drawing on the strengths of research on student engagement and patterns of learning, I then presented a model of student learning that could potentially help the field move toward integration.

One recognized obstacle to integration, however, remains the issue of grain size. I have suggested that the SRL community, given its increasing focus on contextualization and dynamism, may be operating at a finer grain size than researchers of student engagement and patterns of learning. I would also argue that there is perhaps more agreement on the theoretical assumptions underlying learning among researchers of SRL than those who research patterns of learning and student engagement. For example, although it recognizes both personal and contextual influences on learning, there is great variability in the emphases scholars of patterns of learning place on these various factors. Richardson (2013), for example, observed that whereas learning styles are typically assumed to be relatively stable constructs that do not change according to task or context, researchers of SAL often maintain that patterns of learning are contextually driven (Vermunt 1996). However, from an SRL or strategic-processing perspective, patterns of learning are often operationalized in a manner that makes it appear to be a generally stable construct (Dinsmore and Alexander 2012; Pintrich 2004). Similarly, there does not appear to be consensus about the optimal theoretical model of student engagement.

Another related issue that I see in the collective research on higher education relates to the role of motivational factors. All three perspectives clearly recognize the importance of motivation on learning. However, again, there seems to little agreement as to where in the learning process motivation comes in. Most SRL models, recognizing the vast history of research on student motivation, consider motivation to be a separate but related construct from cognition. In comparison, the SAL perspective mostly combines motives with strategies, as does to a certain extent, models of student engagement. What is worthy of mention is that the three/four motives often referred to in the SAL literature align mostly with the contemporary research on achievement goal theory (Maehr and Zusho 2009).

Accordingly, I will conclude with the following suggestion for future research in higher education. First and foremost, efforts need to be made to make the theoretical assumptions of each perspective more transparent and consistent. As of now, I would argue that the perspectives vary in terms of how person-centered learning is; with learning styles and SAL research on the one end, and certain perspectives of SRL that assume learning to be mostly context-dependent on the other end. We also need more precise demarcation between the antecedents and outcomes of learning, and more defined specification about the role of motivation on learning. A common area of concern across all three perspectives is measurement; but as Dent and Hoyle (2015) suggest, what and how you measure should depend on conceptualization. Thus, to the extent that conceptual framing remains murky, measurement issues, and most important, interpretation issues are likely to continue.

Compliance with Ethical Standards

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