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Assessment of Student Engagement in Higher Education: A Synthesis of Literature and Assessment Tools

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Abstract. Educational research increasingly highlights the importance of student engagement and its impact on retention, learning and persistence. Despite widespread agreement on the value of student engagement, assessing engagement in higher education remains a challenge. To effectively measure student engagement (and understand its influence on the learning experience), it is essential that each institution defines the scope of engagement within their unique context and selects assessment metrics that align with the target definition. The dynamic nature of engagement mandates a multi-faceted approach to assessment that captures the interactive nature of the behavioral, affective and cognitive dimensions comprising student engagement. The value of various modes and tools for assessing student engagement in higher education are discussed.

Keywords: student engagement; assessment of engagement; engagement metrics; cognitive engagement

Introduction

With increased emphasis on promoting student engagement in postsecondary classrooms (Barkley, 2010; Bowen, 2005; Günüç & Kuzu, 2014; Korobova & Starobin, 2015), it becomes imperative that educators are able to gauge, monitor and assess student engagement as a component of the overall learning experience (Butler, 2011; Chapman, 2003; Fredricks & McColskey, 2013; Garrett, 2011; Kuh, 2001; Mandernach, Donnelli-Sallee, & Dailey-Hebert, 2011; Rust, 2002). While there is considerable evidence validating the importance of engagement for fostering student learning (Carini, Kuh & Klein, 2006; Cross, 2005; Guthrie & Anderson, 1999; Handelsman, Briggs, Sullivan & Towler, 2005; Kearsley & Shneiderman, 1998; Skinner, Wellborn & Connell, 1990; Zhao & Kuh, 2004), promoting student retention (Braxton, 2008; Kushman, Sieber & Heariold-Kinney, 2000; Woods, 1995), enhancing quality assurance (Banta, Pike & Hansen, 2009; Coates, 2005), and impacting student persistence (Milem & Berger, 1997), faculty and administrators still struggle to effectively assess student engagement at both the institutional and course levels.

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Much of the challenge in assessing student engagement comes from the lack of a unified definition to define the scope, intent and parameters of engagement. As highlighted by Bowen (2005, p. 4), "an explicit consensus about what we actually mean by engagement or why it is important is lacking." Yet, despite the divergence of operational definitions, Shulman (2005) maintains that postsecondary institutions must be diligent in fostering and monitoring engagement as "learning begins with student engagement" (p. 38).

Defining Student Engagement

In its infancy, student engagement was defined primarily by students' time-on-task with educational activities (Brophy, 1983; Fisher, Berliner, Filby, Marliave, Cahen & Dishaw, 1980; McIntyre, Copenhaver, Byrd, & Norris, 1983). While most definitions of engagement still include students' investment in learning activities as a key component of engagement, current definitions of student engagement have expanded to include interrelated cognitive and affective components. Emphasizing that cognitive engagement involves not only a behavioral investment of time, but also requires investment of attention and intellectual vigor, Astin (1984, p. 298) defines engagement as "the amount of physical and psychological energy that the student devotes to the academic experience." Integrating the affective components of the learning experience, Skinner and Belmont (1993, p. 572) define student engagement as "sustained behavioral involvement in learning activities accompanied by positive emotional tone." Differentiating this type of engagement from satisfaction, Barkley (2010) highlights that "…engaging students doesn't mean they're being entertained. It means they are thinking." (p. xii).

Other definitions emphasize that engagement rests not only in the choices made by students, but in the opportunities available through the institution; as defined by Natriello (1984, p. 14) engagement involves "participating in the activities offered as part of the school program." Kuh (2003) provides an integrated definition encompassing the cognitive, affective and behavioral aspects of engagement while highlighting the reciprocal responsibility of both the students and the institution to fostering engagement; as explained in this definition, student engagement is "the time and energy students devote to educationally sound activities inside and outside of the classroom, and the policies and practices that institutions use to induce students to take part in these activities" (Kuh, 2003, p. 25).

The range of definitions for student engagement converges to emphasize three interrelated aspects of student engagement: cognitive, behavioral, and affective (Handelsman, Briggs, Sullivan, & Towler, 2005). As outlined by Chapman (2003, para. 6):

- cognitive criteria, which index the extent to which students are attending to and expending mental effort in the learning tasks encountered;
- behavioural criteria, which index the extent to which students are making active responses to the learning tasks presented; and
- affective criteria, which index the level of students' investment in, and their emotional reactions to, the learning tasks.

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Examining these indicators as the impetus behind measures of student engagement, Butler (2011) differentiates typical assessment indicators along each dimension; see Table 1 for examples.

Table 1: Examples of Assessment Items to Gauge Types of Engagement

Behavioral	Cognitive	Affective
Frequency of asking questions in class	Proportion of coursework emphasizing higher order thinking strategies	Effort to work harder to meet instructor's expectations
Frequency of group projects or collaborative work	Time spent on projects requiring integration and synthesis of ideas	Investment to better understand someone else's perspective
Frequency of tutoring others	Amount of coursework requiring practical application of knowledge or skills	Time investment in studying
Frequency of attending events in the community related to course material		Tendency to be prepared (or lack preparation) for class
		Frequency of discussing course material outside of classtime

Understanding assessment of student engagement rests in an awareness of the range and diversity of definitions for this concept. To effectively assess student engagement, one must know what aspect (or aspects) of engagement are being targeted. As outlined by Bowen (2005), student engagement can be defined in four interrelated ways: 1) engagement with the *learning process* (i.e., active learning); 2) engagement with the *object of study* (i.e., experiential learning); 3) engagement with the *context of study* (i.e., multidisciplinary learning); and 4) engagement with the *human condition* (i.e., service learning).

Inherent in assessment debates concerning the definition and scope of student engagement is the subtle differentiation between engagement as a *process* versus a *product*. While Bowen (2005) contends that most assessments of student engagement emphasize the learning *process*, Barkley (2010) highlights that "student engagement is the *product* of motivation and active learning. It is a product rather than a sum because it will not occur if either element is missing" (p. 6). While subtle, this distinction has important implications for assessment as it defines the scope of the measurement; specifically, assessments of process emphasize behaviors, activities and attitudes that contribute to student learning while assessments of product emphasize engagement as a cognitive or affective state resulting from the learning process.

Despite this subtle distinction, most measures of student engagement incorporate aspects of both the process and product of student engagement by examining students' active role in the process of learning as well as their resultant cognitive and affective positions. As such, not only do measures of engagement examine students' perceptions of the learning process, but include an examination of the "frequency with which students participate in activities that represent effective educational practices, and conceive of it as a pattern of

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involvement in a variety of activities and interactions both in and out of the classroom and throughout a student's college career" (Barkley, 2010, p. 4). This theoretical position provides the foundational basis of many of the institutional assessments of student engagement that operationalize engagement as a product of student investment in scholarly activities and institutional allocation of resources to foster student engagement. Likewise, on a smaller scale, these same principles can be applied to course-level engagement measures examining engagement opportunities and students' involvement in course-related activities.

Assessment Approaches

The wide variability of engagement definitions and the complexity surrounding student engagement mandates necessary diversity in measurement approaches and techniques. Assessment of student engagement varies as a function of both the accepted definition of engagement and the data collection methods. As such, there are a number of avenues for collecting student engagement data (Chapman, 2003; Fredricks & McColskey, 2013; Jennings & Angelo, 2006): student self-report, experience sampling, teacher ratings of students, interviews, direct observation, checklists and rating scales, work sample analysis, and focused case studies. Table 2 provides an overview of each approach.

Table 2: Data Collection Methods to Measure Student Engagement

Data Collection Method	Description	Strengths	Challenges
student self-report	Students indicate their engagement (as a function of level, agreement or perception) in response to specific attitudes, behaviors or experiences.	Practical, cost-efficient approaches for group and/or large-scale administration; provide a means of measuring non-observable, perceptual or subjective indicators of engagement.	Concerns with honesty and/or accuracy of responses; generalized nature of items may limit the value of responses.
experience sampling	Used as an indicator of engagement "flow," selected students respond to selected dimensions of engagement (such as current activities, cognitive state and affect level) in response to an electronic "alarm" that signals at various times.	Provides a means of contextualizing engagement track engagement levels in the moment as well as across time and situation.	Requires considerable investment of time and resources from students in the sample; examines a limited aspect of engagement.
teacher ratings of students	Teachers provide ratings of their	Valuable for examining the	Valid perceptions may be limited to the more

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	perceptions of behavioral and/or emotional aspects of student engagement.	alignment between student and teacher perceptions of engagement in the classroom.	observable, behavioral indicators of student engagement.
interviews	Students are asked to discuss their engagement in an open-ended manner	Elicits a more detailed, individualized, contextualized understanding of student engagement.	Concerns with interviewer bias and social desirability factors may influence accuracy of findings.
direct observations	Structured technique for monitoring and recording students behavior along pre-defined indicators of engagement.	Provides detailed, descriptive accounts of momentary time sampling of student engagement	Reliability may be impacted by observer bias; techniques may be time consuming; measurements limted to observable behavior.
checklists and rating scales	Provides the frequency and investment of specific target behaviors; may be a self-rating or observer-rating	Provides data on behavioral indicators of engagement	Lacks information to explain the reasoning behind behavioral indicators
work sample analysis	Utilizes samples of students' work to assess for higher-order thinking	Provides indication of cognitive engagement as a summative indicator of the outcome of various behavioral factors	Concerns with the reliability of scoring; outcome may be impacted by factors other than student engagement
focused case studies	Large amounts of detailed data are collected in relation to a small, select sample of students	Rich data highlighting behaviors, interactions and contextual factors	May have limited generalizability to other student populations

Measures of Engagement

As previously highlighted, student engagement is a complex phenomenon that encompasses a range of behavioral, cognitive and affective components of the learning experience; equally varied is the range of data collection approaches available to gauge student engagement. The result of this diversity is a plethora of assessment choices ranging from informal, course-based snapshots to highly-structured, standardized tests of engagement. Selection of a specific approach and measure of student engagement is driven by the parameters surrounding the use and intent of the data. Broadly speaking, assessment data can provide two types of information: 1) informal, formative feedback, or 2) formal, summative data.

Informal measures of engagement provide formative data to guide instructional, course or program development; informal assessments of engagement provide feedback during the learning process in a manner that allows for adjustment in

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instructional strategies or institutional initiatives to more effectively foster student engagement. Formative monitoring is typically conducted at the course level and relies on informal indicators of engagement (Jennings & Angelo, 2006) including: instructor observations of student behavior, students' self-reports and administrative records.

- *Instructor Observations of Student Behavior* – There are a number of behavioral indicators that provide a quick, visual assessment of students' level of engagement in a given course. Kuh (2003) highlights four effective behavioral practices that promote engagement: 1) collaborating with peers, 2) interacting with faculty, 3) participating in learning communities, and 4) devoting significant time to academic tasks. As a function of these dimensions, Franklin (2005) emphasizes that engaged students are more likely to actively listen, respond to questions, collaborate with peers, and actively participate in class. Instructors may informally monitor students' behavior on these dimensions to gauge engagement in response to various instructional strategies within a given class.
- *Students' Self-Reports* – To assess students' engagement with course material or institutional initiatives, self-report data can be collected concerning course activity journals, focus groups or informal questionnaires. Through direct self-report measures, engagement can be analyzed via the affective (i.e., perceptions, attitudes), behavioral (i.e., activities), and cognitive (i.e., interest, active understanding) aspects of the students' learning experience. Information self-report measures of engagement should be careful to differentiate between satisfaction and engagement (Jennings & Angelo, 2006) by emphasizing time-on-task, investment in course-related interactions and active involvement with learning resources (Nauffal, 2010).
- *Administrative Records* – Administrative data (such as attendance, assignment submissions, adherence to assignment guidelines and participation in ancillary activities) can be examined as an indicator of student engagement (Mandernach, Donnelli-Sallee & Dailey-Hebert, 2011). Using activity data as a proxy for motivation or interest, these indicators provide evidence of the degree to which students have invested in the process of learning.

Complementing formative feedback, formal measures of engagement provide summative data to gauge effectiveness and institutional initiatives. While informal measures are often collected during the learning process to provide opportunities for reflection and revision, formal measures are typically conducted at the conclusion of a learning experience to provide a metric of program or course effectiveness. Formal measures of student engagement target two discrete levels: institutional and course. "Institutional data determines the extent of student engagement in the overall learning process, while course level data determines the effect of learner-centered pedagogical methods on student success" (Butler, 2011, p. 258). The value of student engagement as a pivotal aspect of an effective learning experience has led to the emergence of a number of standardized instruments to assess engagement at both the course and

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institutional levels. The integration of any of these formalized measures must be based on alignment between target dimensions of each instrument and the needs (at the institutional or course level) driving the integration of the engagement metric (Mandernach, Donnelli-Sallee & Dailey-Hebert, 2011). The following sections highlight key engagement metrics including an overview of the target dimensions, utility and relevance of each.

Institutional Assessment of Student Engagement

Institutional measures of student engagement are designed to "evaluate students' levels of engagement and the effectiveness of specific engagement activities at the institutional level" (Butler, 2011, p. 259). The broad focus of these measures makes them amenable for tracking institutional progress in fostering engagement and/or comparisons between institutions. A number of these measures are geared at an overall assessment of engagement encompassing cognitive, affective and behavioral domains (i.e., NSSE); other measures target specific institutional types (i.e., CCSSE) or student populations (i.e.,CSS).

National Survey of Student Engagement (NSSE). The National Survey of Student Engagement (NSSE) measures institutional engagement over five dimensions of engagement: level of academic challenge, active and collaborative learning, student-faculty interaction, enriching educational experiences and supportive campus environment (NSSE, 2009). Used extensively in the United States to assess "the amount of time and effort students put into their studies and other educationally purposeful activities… [and] how the institution deploys its resources and organizes the curriculum and other learning opportunities to get students to participate in activities that decades of research studies show are linked to student learning" (About NSSE, 2010, para. 1). The NSSE provides a global perspective of student engagement and is designed to measure student involvement in educationally purposeful activities that directly impact their learning and success in college (Kuh, 2001). Items on the NSSE require students to assess their own level of engagement via behavioral indicators (NSSE, 2005) including participation in class discussions, preparation of drafts prior to submitting assignments, interactions with classmates outside of class on course-related items, and integration of resources for course assignments.

College Student Experience Questionnaire (CSEQ). The College Student Experiences Questionnaire (CSEQ) instrument is designed to measure the "quality of student experiences, perceptions of the campus environment, and progress toward important educational goals" (CSEQ, 2007, para. 1). The goal of the CSEQ is to assess students' perceptions of the overall learning environment to provide instructors and administrators with diagnostic, formative feedback (Kember & Leung, 2009; Kuh, 2007). The CSEQ aligns general issues of engagement according to student-faculty contact, cooperation among students and active learning (Koljatic & Kuh, 2001).

Student Engagement Questionnaire (SEQ). The Student Engagement Questionnaire (SEQ) is designed to collect data on students' holistic reflections of their overall experiences rather than recent activities or a specific course (McNaught, Leung & Kember, 2006). As a measure of the progression of engagement, the SEQ is

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administered at key stages (end of first year and exit point from their undergraduate program) to examine both cognitive aspects of engagement as well as active involvement in the teaching and learning environment.

Faculty Survey of Student Engagement (FSSE). The Faculty Survey of Student Engagement (FSSE) is an adaptation of the NSSE designed to assess faculty perceptions of student engagement in relation to their overall student perspective or focusing on a specific course (Ouimet & Smallwoord, 2005). Recognizing the role that faculty play in fostering student engagement (Kuh, Nelson, Laird & Umbach, 2004: Umbach & Wawrzynski, 2004), the FSSE assesses faculty views in relation to: 1) the frequency at which students actively participate and engage in the learning process; 2) perceptions about the value and relevance of various forms of engagement; and 3) the nature of faculty-student interactions.

Community College Survey of Student Engagement (CCSSE). The Community College Survey of Student Engagement (CCSSE) was adapted from the NSSE to specifically examine the unique missions, objectives and student populations of 2-year community colleges (Butler, 2011; McClenney, Marti, & Adkins, 2006). As such, the CCSSE targets: 1) active and collaborative learning; 2) student effort; 3) academic challenge; 4) student-faculty interactions; and 5) support for learners.

College Student Expectations Questionnaire (CSXQ). The College Student Expectations Questionnaire (CSXQ) is adapted from the CSEQ to target the motivations and goals of *new* students in relation to college activities and campus environment (CSEQ, 2007). As a companion measure to the CSEQ, data can be longitudinally analyzed to examine the extent to which students' preliminary expectations were met by the institution.

Beginning College Survey of Student Engagement (BCSSE). Like the CSXQ, the Beginning College Survey of Student Engagement (BCSSE) assesses engagement dimensions of students entering college. The BCSSE examines the expectations of beginning college students for participating in academic initiatives and activities via six dimensions: 1) high school academic engagement; 2) expected academic engagement; 3) expected academic perseverance; 4) expected academic difficulty; 5) perceived academic preparation; and 6) importance of campus environment (BCSSE, 2010). Data from the BCSSE may be used by institutions to guide advising; used in conjunction with the NSSE, data can also provide indicators of the extent to which institutions have met students' expectations regarding engagement in the academic community.

College Senior Survey (CSS). The College Senior Survey (CSS) is designed as an exit survey for graduating seniors to assess a range of student perceptions relevant to academic engagement, student involvement and resource use. Specific to these objectives, CSS "connects academic, civic, and diversity outcomes with a comprehensive set of college experiences to measure the impact of college" (Higher Education Research Institute, 2013, para. 1). While the scope of the CSS goes beyond student engagement, engagement is a key component assessed within the measure.

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Course Assessment of Student Engagement

Course level measures of student engagement provide valuable feedback to gauge and enhance students' investment in the learning process as a reflection of the unique structure, pedagogy and design of a given course. In reflection of the formative value of course level engagement metrics, Barkley (2010) explains that "whatever means teacher use to assessment engagement in their classes, gathering appropriate feedback can help close the gap between what teachers think is happening in their classes and what students are actually experiencing" (p. 44). In contrast to the broad focus of institutional indicators of engagement, course engagement measures target students' behavioral, affective and cognitive reactions in response to a target course (Goldspink & Foster, 2013; Laird, Smallwood, Niskode-Dossett & Garver, 2009).

Classroom Survey of Student Engagement (CLASSE). Designed as a complementary measure to the FSSE, the Classroom Survey of Student Engagement (CLASSE) assesses student perceptions of engagement in a course (Ouimet & Smallwood, 2005). The student version of CLASSE metric measures the frequency by which students engage in various educational activities, while the faculty version of CLASSE gauges the importance of each of these indicators for facilitating student success within a specific course (Smallwood & Ouimet, 2009). The comparison of the two versions of CLASSE can be examined to identify discrepancies between student and faculty reports of engagement at the course level. Recognizing the formative focus of CLASSE, faculty using CLASSE indicate that it prompts more reflective teaching, enhances communication with students about learning opportunities, and fosters a more cooperative and interactive classroom environment (Ouimet & Smallwood, 2005).

Student Engagement Index. Developed to identify specific measures of classroom engagement aligned with each of the NSSE's benchmarks (Langley, 2006), the Student Engagement Index measure examines student engagement as a function of: 1) level of academic challenge; 2) quality of student interactions with faculty; 3) active and collaborative learning environments; and 4) enriching educational experiences and supportive campus environment (Langley, 2006). Within each benchmark, key indicators are assessed:

- Level of academic challenge measures student effort, time investment and interaction expectations with course-related activities.
- Quality of student interactions examines students' access to contact with the instructor, quality of instructor feedback, student-instructor relationships, supportive classroom environment and instructor clarity and organization.
- Active and collaborative learning focuses on student involvement in the learning process via active and collaborative learning.
- Enriching educational experiences examines diversity issues, integration and synthesis of knowledge, professional experiences and general technology issues.

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Student Course Engagement Questionnaire (SCEQ). In contrast to the measures adapted from broader engagement surveys, Handelsman, Briggs, Sullivan and Towler (2005) devised a measure of student course engagement (Student Course Engagement Questionnaire; SCEQ) that breaks course engagement into four distinct forms: 1) skills engagement; 2) emotional engagement; 3) participation/interaction engagement; and 4) performance engagement. Broadly encompassing behavioral, cognitive and affective aspects of engagement, the SCEQ assesses each dimension of engagement in relation to students' course involvement:

- Skill engagement examines academic learning strategies and study behaviors that promote academic success.
- Emotional engagement assesses affective components in which students internalize learning through an emotional connection to course material.
- Participation/interaction engagement measures students' interaction with the instructor and classmates in relation to course material.
- Performance engagement targets students' perspectives and self-efficacy in relation to mastering course content.

As highlighted by Handelsman et al. (2005) the SCEQ provides a more comprehensive understanding of student engagement and fosters insight beyond what is visible in behavioral observations of classroom engagement.

Student Engagement Survey (SE). The Student Engagement Survey is a short, 14-item assessment that adapts target items from the NSSE survey for use at the course level (Ahlfeldt, Mehta & Sellnow, 2005). The selected questions examine student engagement as a function of: 1) collaborative learning; 2) cognitive development; and 3) personal skills development. Respondents rate the frequency of active learning strategies, interactivity, required depth of learning, and skill development within the context of a target course.

Behavioral Engagement Related to Instruction (BERI). Designed to quantitatively measure student engagement in large college classes, the BERI is a classroom observation protocol emphasizing teaching behaviors that impact student engagement (Lane & Harris, 2015). Conducted via an external observer, the BERI provides formative information to guide instructors on instructional techniques that foster increased student engagement.

Conclusion

Complexity surrounding assessment of student engagement is a natural by-product of the dynamic, interactive nature of this phenomenon. Marcum (2000) attempted to capture the intricacies of engagement via a conceptual formula in which:

$$E = L(I+ Cp + Ch)x\ Inv\ (A + Co + Cm) => IK/Ef => E$$

In explanation, "Engagement = Learning (Interest + Competence + Challenge) x Involvement (Activity + Communication + Commitment) producing Increased Knowledge and Effectiveness which results, typically, in increased Engagement. The process amounts to a dynamic evolving system" (Marcum, 2000, p. 59). Echoing the dynamic relationship between engagement variables, Barkley (2010)

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explains that "motivation and active learning work together synergistically, and as they interact, they contribute incrementally to increase engagement… active learning and motivation are spirals working together synergistically, building in intensity, and creating a fluid and dynamic phenomenon that is greater than the sum of the individual effects" (p. 7).

As highlighted by these conceptual defintions, student engagement cannot be effectively defined or measured by a singular assessment strategy. The dynamic nature of engagement mandates a multi-faceted approach to assessment that captures the interactive nature of the behavioral, affective and cognitive dimensions comprising student engagement. As student engagement is an integral component of a successful learning experience, it is essential to select assessment strategies that consider the range of interactive engagement components, variability in purposes of engagement data, and differences in the target level of analysis. Combining the information available through informal and formal indicators of engagement at both the course and institutional level, the assessment of student engagement provides vital data to inform pedagogy and programmatic initiatives to foster engagement in support of students' psychosocial growth, cognitive understanding and professional development.

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