Student Engagement in Open, Distance, and Digital Education

75

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Contents

Abstract

Engaging students in their learning, and within their learning community, is a key goal of educators. However, ongoing discussions about its nature, conceptualization, and measurement have led to a diffusion of the concept's understanding, and ability to apply it within both research and practice. This chapter draws on theoretical and empirical primary and secondary ODDE research, and provides an overview of student engagement and disengagement, particularly as they relate to educational technology. The four dimensions of behavioral, affective/emotional, cognitive, and social (dis-)engagement are presented, alongside example indicators. In addition, a bioecological model of student engagement is explored with explicit links to digital learning. The chapter concludes by providing open questions and directions for future research, including further emphasis and

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exploration needed on the role of social engagement in ODDE contexts, as well as disengagement as a separate construct.

Keywords

Student engagement · Disengagement · Educational technology · Digital technology · Online learning · Remote learning · Blended learning,

Introduction

Engaging students in learning is a key goal of educators, especially as disengagement has been found to profoundly affect students' cognitive development and learning outcomes (Ma, Han, Yang, & Cheng, 2015), and is a predictor of student dropout in both secondary and higher education (Finn & Zimmer, 2012). As such, student engagement has received increasing attention over the past decade (Aparicio, Iturralde, & Maseda, 2021), suffering from ongoing criticism about its continued fuzziness as a construct (Trowler, Allan, Bryk, & Din, 2021), and being described in various ways in the literature.

There has also been widespread discussion about the nature, conceptualization, and measurement of engagement, as well as the level of theorizing being undertaken, in the field of open, distance, and digital education (e.g., Bergdahl, 2020; 2022c, Bond, 2020b; Henrie, Halverson, & Graham, 2015). While research has found that using educational technology can lead to improved self-regulation and self-efficacy (Alioon & Delialioğlu, 2019), increased participation (Northey, Bucic, Chylinski, & Govind, 2015), and increased involvement in the wider educational community (Junco, 2012), educational technology research has often lacked theoretical guidance (Bergdahl, Nouri, Karunaratne, Afzaal, & Saqr, 2020; Bond, Buntins, Bedenlier, Zawacki-Richter, & Kerres, 2020; Hew, Lan, Tang, Jia, & Lo, 2019). Given the difference between on-site/learning and learning undertaken in ODDE contexts, particularly within the current climate of remote and hybrid learning, it is crucial that further attention is given to understanding the complex interplay of digital learning environments and emerging educational modes (Bergdahl, 2022b), teacher-student relationships (Bergdahl & Bond, 2021), and learning activities (Bergdahl, 2022a).

This chapter, therefore, draws from and builds on the doctoral work and ongoing research of Bond (2020a) and Bergdahl (2020), and provides an overview of the concept of student engagement, particularly as it relates to educational technology. It will then briefly outline recent student engagement and ODDE research, provide implications for practice, and suggest future research directions.

What Is Student Engagement?

The concept of student engagement arose out of a range of previous theories, which has led to discussions centering around the depth and breadth of its operationalization (e.g., Eccles, 2016; Lawson & Lawson, 2013). There is, however,

widespread agreement as to its multifaceted and complex nature (Appleton, Christenson, & Furlong, 2008; Fredricks, Blumenfeld, & Paris, 2004; Kahu, 2013), with Azevedo (2015, p. 84) declaring that it is

> one of the most widely used and overgeneralized constructs found in the educational, learning, instructional, and psychological sciences.

Similarly, Kearsley and Shneiderman (1998) developed a framework for technology-based teaching and learning, based on the principles of "Relate, Create, and Donate," calling it Engagement Theory. For them, engaged learning involved active cognitive processes, such as problem-solving and decision making, based on meaningful and authentic collaborative activities.

The Community of Inquiry framework (Garrison, Anderson, & Archer, 2000) furthered understanding of these collaborative activities that promote engagement, by describing the importance of teacher presence, social presence, and cognitive presence in facilitating effective educational experiences. Community Theory (Rovai, Wighting, & Lucking, 2004; Wenger, 2008) also influenced student engagement theorizing, with its emphasis on active participation, a sense of belonging and/or a feeling of membership, and the development of trust in self, peers, and the teacher. While Self-Determination Theory (Deci & Ryan, 1985) recognizes the role that teachers and peers play in influencing levels of intrinsic and extrinsic motivation, motivation is instead seen as an antecedent to engagement, as the intent that energizes behavior (Lim, 2004; Reeve, 2012; Reschly & Christenson, 2012). However, students can engage in learning without waiting to be motivated (Reeve, 2012). Even though teachers can influence engagement directly (Bergdahl & Bond, 2021), they often try to influence engagement indirectly via motivation and risk overlooking how their learning designs facilitate engagement or trigger disengagement (Bergdahl, 2022c, d). While the constructs are related, motivation alone remains insufficient for students to engage (Bergdahl, 2022c, d).

Astin's (1984) theory of involvement was instrumental in furthering understanding of engagement. He defined involvement as the "physical and psychological energy that the student devotes to the academic experience" (p. 518), occurring along a continuum, with particular focus on active participation, interaction with peers and teachers, time-on-task, and effort, as well as their subsequent relation to satisfaction and overall achievement. Engagement can be approached as a manifestation of energy and effort in action (Filsecker & Kerres, 2014). Based on these ideas, we define student engagement as

> the energy and effort that students employ within their learning community, observable via any number of behavioral, cognitive, or affective indicators across a continuum. It is shaped by a range of structural and internal influences, including the complex interplay of relationships, learning activities, and the learning environment. The more students are engaged and empowered within their learning community, the more likely they are to channel that energy back into their learning, leading to a range of short and long-term outcomes, that can likewise further fuel engagement. (Bond et al., 2020, p. 3)

While it may seem that engagement is defined vaguely, several reviews have revealed that engagement research is consistently strongly correlated with academic

success, and thus remains a core concept in educational research (Alrashidi, Phan, & Ngu, 2016; Henrie et al., 2015; Nkomo, Daniel, & Butson, 2021). It should also be pointed out that, in order for a theory to develop, an understanding of any phenomenon cannot be fixed or cemented. Thus, it should never be a vision to determine a fixed position, but rather to contribute to further understanding.

Contributing to further conceptual understanding, Wang, Fredricks, Ye, Hofkens, and Linn (2017) explored the relationship between engagement and disengagement, and concluded that these should be considered as two separate, but distinct constructs, each with its own continuum; a position supported here and discussed in greater depth within The Microsystem Level section in this chapter. When applied as a meta-concept, researchers might be less prone to explore the dimensions or the relations between the indicators of the dimensions. However, what the relationship between engagement and disengagement is at a microlevel, remains an important one to explore.

Bond (2019) proposed a bioecological model where engagement can be approached at the macro-, meso-, and microlevel, and later Bergdahl (2022b) explored engagement at the microlevel. Both articles assume that learning exists in a social reality. We therefore start by positioning engagement in a sociocultural context.

Sociocultural Positioning of Student Engagement

Student engagement does not occur within a vacuum; it is influenced and impacted by many contextual factors (Kahu, 2013; Quin, 2017). By considering the wider sociopolitical context influencing student engagement, a clearer and more holistic understanding of students and their learning can be gained (Appleton et al., 2008). Following an extensive review of student engagement literature, both theoretical and primary/secondary empirical research (Bond, 2020b; Bond & Bedenlier, 2019; Bond et al., 2020), and through conducting empirical studies (e.g., Bond, 2019), a bioecological model of student engagement was developed (see Fig. 1), based on Bronfenbrenner and colleagues' model of child development (e.g., Bronfenbrenner, 1979). This model places the student at the center of the microsystem, nested within a system of intertwined milieus; the mesosystem, representing interactions between the micro- and exosystems, as well as between microsystems; the exosystem, including wider social structures impacting on the learner; and the macrosystem, encompassing the wider political, cultural, economic, and legal systems, in which all systems are located. The remainder of this chapter will focus on the meso- and the micro-system.

The Mesosystem Level

The mesosystem level represents a student's social milieu and background, as well as their location and socioeconomic status. In some (dis-)engagement research, the reasons that students disengaged were sometimes identified in the meso-level – for

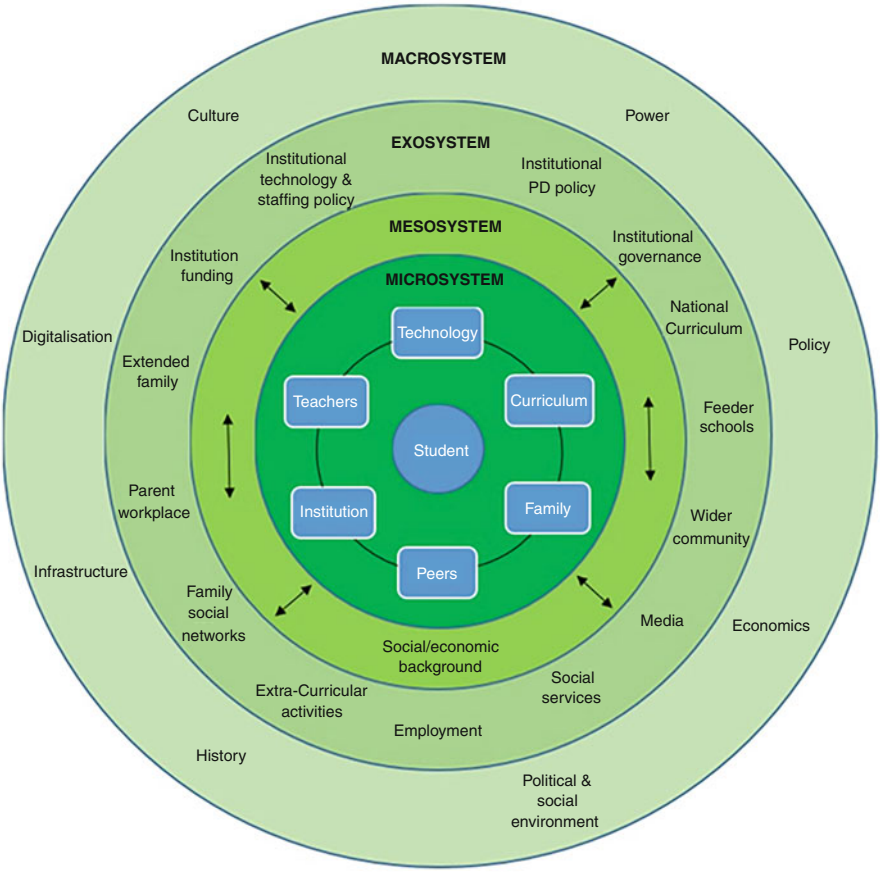

Fig. 1 Bioecological model of student engagement (Bond, 2020a, 2020b)

example, socioeconomic factors and the stress level in the family (Alexander, Entwisle, & Kabbani, 2001), the number of siblings in the family (Chiu, 2010), and parental engagement (Bond et al., 2021). Economic factors can impact on the ability of families to afford devices (Warschauer & Xu, 2018), as well as access to the internet (Bond, 2019). Despite access to technology continually growing, issues of a digital divide persist, even in countries that are considered wealthy (Bond, Bedenlier, et al., 2021; Bond et al., 2021).

With multiple influential aspects in an increasingly digital context (dis-)engagement is subject to negotiation (Bergdahl & Bond, 2021). A learning context may be comprised of the educational mode (blended, hybrid, distance, or f2f), classroom leadership (including teacher self-efficacy), student self-perceptions and profile, and the available digital and analogue resources (ibid.), which create conditions under which engagement is affected. For example, distance education with mainly asynchronous elements has been found to primarily facilitate cognitive engagement,

whereas distance education characterized with mainly synchronous elements, relied on social engagement (Bergdahl & Gyllander Torkildsen, 2022). Both of these modes of education challenge the teacher to not simply roll with what is easiest to enable in that particular mode, but what benefits learning most.

Conducting a needs analysis of digital device access at the beginning of a course is therefore vital, especially in ODDE, as this can help deepen understanding of any real or potential barriers to engagement (Goodall, 2018). It is also important to be cognizant of student ownership and use of devices that are not compatible with those used by the institution, as this can impact participation and engagement (Bond, 2019), as can rules at institutions for using certain apps within courses, especially in light of the GDPR in Europe (Bond, Marín, Dolch, Bedenlier, & Zawacki-Richter, 2018). Approaching this level could, for example, be beneficial when evaluating a mode of educational delivery, or institutional interventions aimed at increasing engagement and redeeming disengagement for specific groups of students.

The Microsystem Level

The microsystem includes the students' immediate setting, for example, home or the classroom, and includes interaction with teachers, peers, authentic and worthwhile tasks (Kearsley & Shneiderman, 1998; Lim, 2004), the institution, family, and technology (Willis, Povey, Hodges, & Carroll, 2018). These external factors play a vital role in students' ongoing sense of connectedness, well-being, engagement, and success (Aldridge & McChesney, 2018). It is also important to consider the internal psychosocial influences on engagement, including motivation, skills, self-efficacy, well-being, and self-regulation (Bandura, 1995; Reschly & Christenson, 2012; Zepke, 2014), alongside their prior experiences with and level of acceptance of technology (Moos & Azevedo, 2009). This is also true of both teachers (Marcelo & Yot-Domínguez, 2018) and parents (Ihme & Senkbeil, 2017), whose attitudes to and skills with using technology can influence students (Krause, 2014).

There are (at least) two ways of approaching engagement within the microsystem level: a general level of engagement and momentary engagement. Sometimes, the general level is referred to as a macro-level (but this should not be confused with levels in the bioecological model above cf. Symonds et al., 2021). The general level (or macro-level) uses one data-point to reflect engagement in all subjects or across a full semester. The momentary (microlevel) engagement is used to reflect engagement in situ, and to capture fluctuations of student engagement in learning by comparing engagement on a day-to-day, lesson-to-lesson or activity-to-activity basis. A micro-level of engagement is useful when understanding how learning activities engage students, evaluate the effectiveness of learning designs, and can inform variations of engagement throughout the day, week, or across subjects. Conducting a Mixed Method Grounded Theory (MMGT) study, Bergdahl (2022c) approached teachers who regularly taught remote, hybrid, and distance courses across K-12 and adult learning. The teachers used a diary to reflect on students' level of engagement (by using a 1–5 scale, where one was low level and five was a high level of

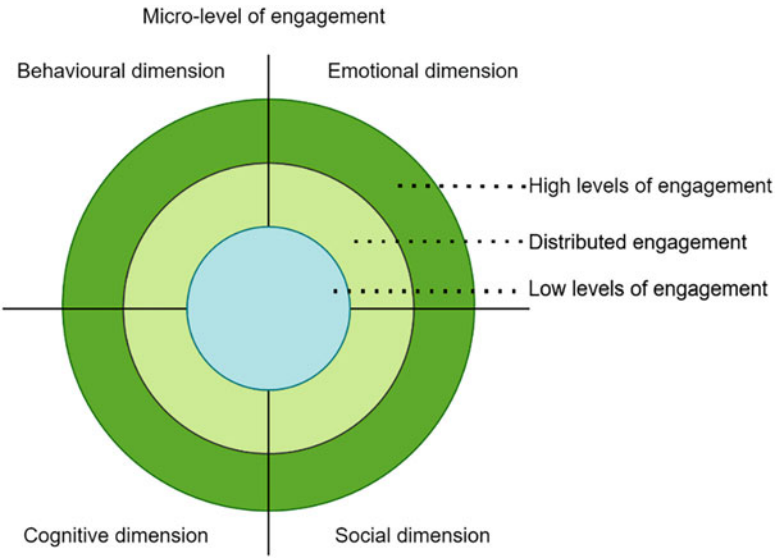

Fig. 2 Microlevel of engagement (Bergdahl, 2022c). Model viewed from above

engagement), as well as how they experienced student engagement online. Following an analysis of teacher perceptions of online engagement, a model of microlevel engagement was suggested (see Fig. 2).

Figure 2 suggests that there are qualitative aspects to engagement online, i.e., a student can display more engagement or less engagement (Bergdahl, 2022c). The highest level of engagement is visualized as three green layers. When engagement decreases, students rely on less engagement to succeed with their learning. As engagement decreases, the model reflects this with decreased green layers, for that dimension of engagement. For example, removing the outer layer in the cognitive dimension could manifest as attention being distributed (or shared) between listening to the teacher and focusing on non-learning-related activities. The teachers suggested that qualitative aspects include a degree of immediacy and responsiveness, ambivalence, having fragmented attention, and shallow learning (as opposed to deep learning). Ideally, all four engagement dimensions should be (fully) activated when immediacy and responsiveness are displayed. For example, students could be well-prepared with required equipment and materials, having completed their homework (behavioral dimension), exert the effort to master the subject, stay focused (cognitive dimension), display curiosity and aptitude to learn (emotional/affective dimension), as well as invite peers to share their reflections and contribute to a positive learning climate (social dimension). If engagement decreases in one dimension, the outer layer becomes inactive. If it decreases more, another layer is deactivated. When the inner layer is the only layer reflecting active engagement, then engagement levels are at their lowest. While students may have a desire to engage, they no longer participate in the learning activity, but may be fully engaged in

something else that is not education related. The engagement 'in something else', has led to disengagement from learning. It is also important to note that each indicator of disengagement may not have a natural opposite on the engagement scale (and vice versa) (Skinner, Kindermann, & Furrer, 2009); that is, disengagement is more than the lower levels of engagement in ODDE.

One problem with disengagement is that it may spiral into withdrawal, truancy, and dropping out of education (e.g., Tomaszewska-Pękała, Marchlik, & Wrona, 2020). Overlooking disengagement may lead to a failure to uncover critical insights that could redeem disengagement and support students to re-engage (Bergdahl, 2022d). If school students' disengagement spirals into absenteeism and school dropout, for example, it has been shown that they have a hard time reentering and pursuing higher education (Department for Business Innovation and Skills, 2014).

While researchers have suggested that students could be engaged and disengaged at the same time (Fredricks, Reschly, & Christenson, 2019), further insights were needed. Building on the teachers' diaries and interviews in the MMGT study, Bergdahl (2022c) then explored how disengagement and engagement indicators co-occurred when students were reported to engage at different levels (using the 1–5 scale) (see Fig. 3). Students estimated to engage at level 1 and level 5 do not necessarily express this in the same way. For example, students at level 1 were reported to display either disengagement behavior or a combination of indicators or engagement and disengagement. The combinations varied between the estimated levels of engagement (Fig. 3 visualizes level 1 and level 5).

The following abbreviations are used in Fig. 3: Beh, Cog, Emo, Soc for behavioral, cognition, emotion, social dimensions of engagement, and D is used to indicate disengagement: i.e., DBeh for disengagement behavior.

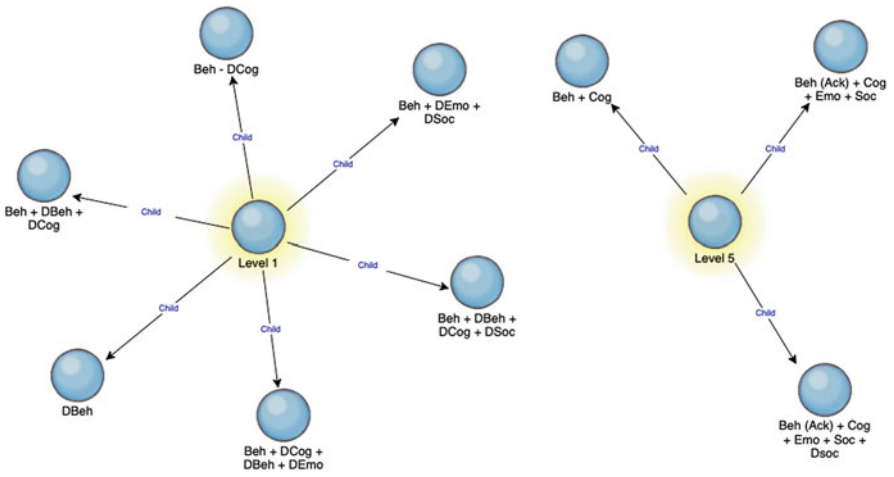

Fig. 3 Teacher reported co-occurrence of engagement and disengagement indicators at levels 1 and 5 (Bergdahl, 2022c)

Indicators of Student Engagement in ODDE

Each dimension of student engagement comprises many indicators (or facets) of engagement (see Table 1, adapted from Bergdahl et al., 2020; Bergdahl & Hietajärvi, 2022; Bond, 2020a, 2020b), as well as disengagement (see Table 2, adapted from Bergdahl et al., 2020; Bond, 2020a, 2020b), experienced as two related but distinctly separate constructs (Wang et al., 2017). Although many studies use three dimensions of student engagement— affective/emotional, cognitive, and behavioral (e.g., Fredricks et al., 2004) — we contend that social engagement plays an important role in student learning (Bergdahl, 2020; Bergdahl, 2022c, Bergdahl & Hietajärvi, 2022; Bond et al., 2021). Individual learning can be reflected using behavioral, cognitive, and emotional engagement, however, there is both individual and social knowledge-building (Stahl, 2006), as "social interaction provides essential cognitive resources for human cognitive accomplishment" (Paavlova et al., 2004, p. 546). As shown above, the MMGT study (Bergdahl, 2022c) identified quite other combinations of engagement co-occurring for highly engaged students. These could include immediacy (cognitive engagement), dedication beyond what was expected (emotional/affective engagement), and social withdrawal (emotional/affective disengagement). Social engagement was also particularly important during the COVID-19 pandemic (Bond et al., 2021) and should now be considered a critical fourth dimension of engagement (Finn & Zimmer, 2012; Linnenbrink-Garcia, Rogat, & Koskey, 2011; Wang et al., 2017), especially in ODDE contexts (Bergdahl, 2022c).

Table 1 Example engagement indicators

Behavioral engagement	Cognitive engagement	Affective engagement	Social engagement
Effort	Critical thinking	Enthusiasm	Collaborating and interacting with peers
Study habits/homework completion	Self-regulation	Interest	Collaborating and interacting with teachers
Attending live lessons	Reflection	Satisfaction	Shared knowledge building
Assuming responsibility	Deep learning	Pride	Asking for help
Participation/ involvement	Focus/ concentration	Excitement	Caring for others

Table 2 Example disengagement indicators

Behavioral disengagement	Cognitive disengagement	Affective disengagement	Social disengagement
Procrastination	Unwilling	Boredom	Feeling isolated
Absence	Apathy	Anger	Not feeling cared for
Giving up	Opposition/ rejection	Dislike	Withdrawing
Poor conduct	Avoidance	Disinterest	Social anxiety
Task incompletion	Unfocused/ inattentive	Frustration	Indifferent or negative to interaction

Social engagement relates to students' positive interaction with teachers, the learning environment, and peers, whereas affective engagement relates to students' enthusiasm, satisfaction, and enjoyment in their learning, as well as their interest and sense of belonging. Behavioral engagement relates to positive conduct, such as attending synchronous lessons, and participating in discussion forums, completing work, and persistence, whereas cognitive engagement relates to deep learning strategies, self-regulation, and understanding.

Behavioral engagement is arguably the easiest domain to measure, as these are observable indicators, such as homework completion. However, a recent scoping review of 243 studies, focused on student engagement while using educational technology in higher education (Buntins, Kerres, & Heinemann, 2021), found that behavioral learning processes were measured as the second most frequent (36.6%, $n = 90$), behind affective learning processes (57.3%, $n = 141$). Nkomo et al. (2021) also argued that measuring only one or two dimensions of engagement in isolation prevents a more holistic and nuanced understanding of student engagement to occur. Engagement is influenced by – and within – the social context it occurs (Bergdahl & Bond, 2021). Thus, engagement is situation-specific, proactive, and reactive to external and internal stimuli and influence. When students display engagement and disengagement simultaneously (Bergdahl, 2022c; Fredricks et al., 2019), cognitive and affective/emotional dimensions of engagement may drive behavioral engagement (Reschly & Christenson, 2006). Bergdahl (2022c) suggested that there seems to be complex intra- and interdimensional influences between all engagement and disengagement dimensions, which seem to affect each other (see Fig. 4).

Figure 4 reflects how an external trigger activates one dimension of disengagement (in the figure, the behavioral dimension is activated) (Bergdahl, 2022c). Even though engagement and disengagement may co-occur, full engagement cannot coexist with full disengagement. Thus, an activated section of disengagement triggers deactivation of an engagement section. For example, an easily distracted

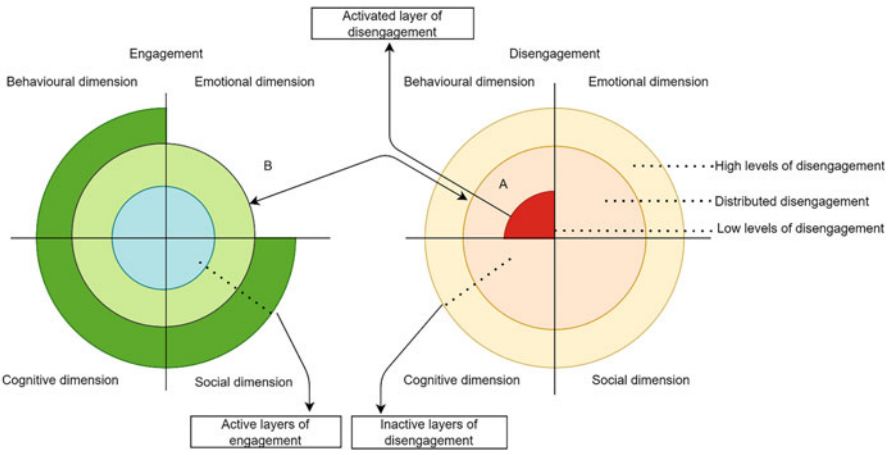

Fig. 4 Interdimensional influences on student engagement

student enters class with an open mind and willingness to learn (emotional/affective engagement) but gets distracted by a mobile phone notification. Here, the student could display behavioral and cognitive disengagement (i.e., by actively choosing to engage in unauthorized uses of digital technologies). In other situations, students could withdraw from interaction and collaboration (social disengagement) due to social insecurities (emotional/affective disengagement).

The empirical results (Bergdahl, 2022c) support previously forwarded suggestions: that emotional/affective states can trigger engagement (Reschly & Christenson, 2006) and that student engagement is "non-linear reactions and pro-actions to internal (e.g., rising and falling fatigue, interest, hunger) and external (e.g., peer comments, teacher instructions) events" (Symonds et al., 2021, p. 14). Importantly, social insecurities were identified as preventing high levels of engagement, even for students who were identified as normally being highly engaged. It is proposed that the teacher's social engagement with the (socially insecure) student could be a way forward to redeem social disengagement in class (Bergdahl, 2022c). After all, it has been found that indicators of engagement are not necessarily the ones that are significant when exploring disengagement, with the validation of a survey (Bergdahl et al., 2020) uncovering that social engagement, and social disengagement, were found to have the highest factor loadings (explanatory values) of all dimensions: indicating that the social dimension is critical critical for students in general, but disengaged students in particular.

Open Questions and Directions for Future Research

This chapter explored how engagement can be approached at different levels, by providing examples of engagement at the meso- and microlevel, as well as how both the emotional/affective and social dimension of engagement are critical for student success. Considering the tradition of exploring engagement as a three-dimensional construct, we strongly encourage researchers to include the social dimension in future research, particularly as it relates to blended and online uses of synchronous and asynchronous collaboration tools, social networking tools, and assessment tools, which are areas that have been less researched in recent years (Bergdahl, 2022b, 2022c; Bergdahl & Gyllander Torkildsen, 2022; Bond et al., 2020, Bond et al., 2021). To further develop engagement theory, the relationship between bioecological levels, for example, how the social dimension of engagement relates to student sociocultural context, and the intra- and interdimensional dynamics between and within engagement and disengagement, across modes of online delivery, need to be further clarified.

We have also discussed how engagement is easier to identify than disengagement. However, one reason for this might be the amount of previous research that has focused on engagement, as opposed to disengagement, which would then have an influential effect on further research. Disengagement can both be used to describe maladaptive behavior and to measure what does not happen, and when learning online, disengagement may be challenging to observe. For example, measuring the

time to initiate work in an LMS has been shown to indicate procrastination, and decreased results and completion (Saqr et al., 2019). However, merely leaving the computer or not logging in, could also mean the computer was not working, or that the student collaborated with a peer and used another account. More research on student disengagement in online learning, that is not unidimensional, is therefore needed. Further to this is the effect of the mode of delivery (synchronous or asynchronous) in ODDE, which has been shown to affect how teachers facilitate student engagement (Bergdahl & Gyllander Torkildsen, 2022).

While we have proposed some entry points for future direction, we would also like to underline that much of the existing research has been conducted in higher education settings, while other educational settings (e.g., hybrid solutions for younger learners, blended learning in primary school, online learning in high school subjects other than STEM) remain largely overlooked (Bergdahl et al., 2020; Bond, 2020b; Bond, Bedenlier, et al., 2021; Bond et al., 2021). Further primary and secondary research that can shine a light on how engagement can be enhanced in these ODDE settings, and how disengagement can be realigned, is much needed.

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