

SYSTEMATIC LITERATURE REVIEW ON AGENTIC ENGAGEMENT: CLARIFYING A CO-CREATION PERSPECTIVE

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Abstract. *Co-creation of learning has been conceptualised as a learner-centred pedagogical approach with implications for students' proactivity, metacognitive, and collaborative involvement. Due to the complexity of the concept, it is difficult to distinguish and measure in practice, with studies reporting measures for co-creative practices mostly in the context of higher education. This paper reviews the literature on student agentic engagement in Web of Science, ERIC and Scopus, providing links to the existing views on learning co-creation at schools. The research instruments developed for studying agentic engagement and autonomy support are discussed in connection to examining co-creation at the secondary education level.*

Keywords: *agentic engagement; autonomy support; co-creation of learning; systematic literature review.*

Introduction

Co-creation of learning involves an interactive process with students and teachers that aims at collaborative value creation and promotes students' agency and development of metacognitive skills (Kaminskienė et al., 2020). It can be implemented within the existing curriculum or as a means for designing a new one. It reflects the constructivist ideas of knowledge construction and socially embedded learning. Understanding of co-creation as “a meaningful collaboration between students and staff, with students becoming more active participants in the learning process, constructing understanding and resources with academic staff” (Bovill et al., 2016) highlights student agency as a central element of co-creation which allows students become stakeholders in the learning process.

Identifying student agency in the classroom thus becomes essential for studying co-creation. The available studies on co-creative practices in education report results mostly from the higher education level (Bovill, 2020; Fraile et al., 2017). However, co-creation is also relevant for the secondary and high school levels where support of self-regulated learning and responsibility for own learning become stressed in the context of life-long learning and democratic education

(Meinking & Hall, 2020). Still, there are not many studies of co-creation at the school level.

Co-creation of learning is related to student engagement (Kaminskiene & Khetsuriani, 2019), some authors even use the terms interchangeably (Bovill, 2020). In itself, engagement is a phenomenon widely studied across three dimensions: behavioural, emotional, and cognitive (Christenson, Reschly & Wylie, 2012). Recently, Reeve proposed agentic engagement as another dimension (Reeve, 2012). Having its roots in the conceptualisations of human agency (Bandura, 2006), agentic engagement of students implies their activeness and influence on the teaching and learning process (Reeve & Tseng, 2011). It can be engendered as asking questions, expressing preferences, choosing a sitting place in the classroom, and generally aiming for improved circumstances and personalisation of learning (Reeve, 2015). This dimension of engagement is based on the self-determination theory (SDT; Ryan & Deci, 2017), according to which human motivation stems from satisfaction of basic psychological needs for autonomy, competence, and relatedness. In the classrooms, teachers regulate the fulfilment of all three types of needs.

Learning co-creation and agentic engagement are emerging concepts (Bovill et al., 2016; Reeve & Tseng, 2011) that emphasize the contribution of students into the learning process. With the lack of studies in the school context, there is a need for a research approach that would be able to consider different implementations and effects of co-creation in the classroom. This paper explores possibilities to look at agentic engagement as lens for studying co-creation. The aim of this paper is to review research literature on agentic engagement of learners at the school level with focus on conceptual grounding and methodological approaches to draw implications for research on learning co-creation in the classroom. The following research questions are addressed: What educational and psychological constructs are associated with the notion of agentic engagement as variables in the research literature? What research instruments were used to study agentic engagement of students at secondary and high school education level?

Methodology

Systematic literature review methodology (Zawacki-Richter et al., 2020) was followed to identify and organise the available literature on the topic. We performed a search in Web of Science, ERIC, and Scopus data bases with the key combination “agentic engagement” (in quotation marks to for the search of the exact phrase) with no limiters applied (in November 2021). The notion is recent, specific and un-ambiguous, so the search yielded a moderate number of results. After the papers had been retrieved and duplicates removed, the search resulted in the total of 79 items (Table 1).

Table 1 Number of database search results with key phrase “agentic engagement” (created by the authors)

Database	Number of items (n)
WoS	49
ERIC	36
Scopus	70
Total	155
Total after duplicates removed	79

The next step was a two-stage selection process. The first stage consisted of title and abstract screening, when 36 items were excluded as they met one or more of the exclusion criteria: (1) not relating to the field of education; (2) not focusing on agentic engagement of learners; (3) not relating to school context; (4) not in English; (5) sample not comprised of students at secondary and high school level. The second stage was a full-text screening, this is when some other 13 items met the exclusion criteria. Thus, 30 articles were selected for further review. Conference papers were not included as they met the exclusion criteria.

The final step involved full-text reading of the papers and classifying them into three types (Table 2).

Table 2 Types of reviewed publications (created by the authors)

Type of publication	Number of items (n)
Theoretical publications (e.g., book chapter, conceptual paper, literature review, meta-analysis)	6
Articles reporting empirical results	20
Articles reporting research instrument validation	4

Reeve and Tseng (2011) were the first to introduce the concept of agentic engagement and the related engagement questionnaire scale. Among the empirical and validation articles, the majority (n=17) were published after 2017. The empirical articles reported results from 11 countries (China, Colombia, Iran, Italy, Israel, Portugal, South Korea, Sweden, Taiwan, Turkey, USA). Nine articles reported results for the context of science teaching, one in language and literature, one in physical education, one in civic education, eight for classroom experience in general or not indicated.

The articles reporting empirical results (n=20) and research instrument validation (n=4) were analysed to answer the research questions of the present review. The theoretical publications contributed to our understanding of the conceptual background of agentic engagement but were not used for synthesising the results of the present review.

The selected articles were carefully read. Then, the information about the aims of studies, research questions, theoretical concepts, methodological

approaches, data collection and analysis methods, samples, main findings was extracted. To answer the first research question, this data was coded for the variables that were analysed along agentic engagement. The codes were then collated and reviewed for overarching categories. This inductive approach resulted in four themes that comprise factors that influence or are associated with student engagement and agentic engagement in particular.

For the second research question, a deductive approach was followed. The methodologies of the empirical and validation studies were studied and classified into quantitative, qualitative and mixed type. The data collection and analysis methods were noted for each study. The synthesised overview is presented in the respective result section. In the following, the overall literature review results are presented according to the research questions.

Research results

Associated constructs and findings from empirical articles

Agentic engagement has been studied as a component of engagement or as a separate variable. The main findings are presented next according to four themes: student individual characteristics and motivation, teaching-learning environment, adolescence as a developmental stage, cultural context considerations (Fig. 1).

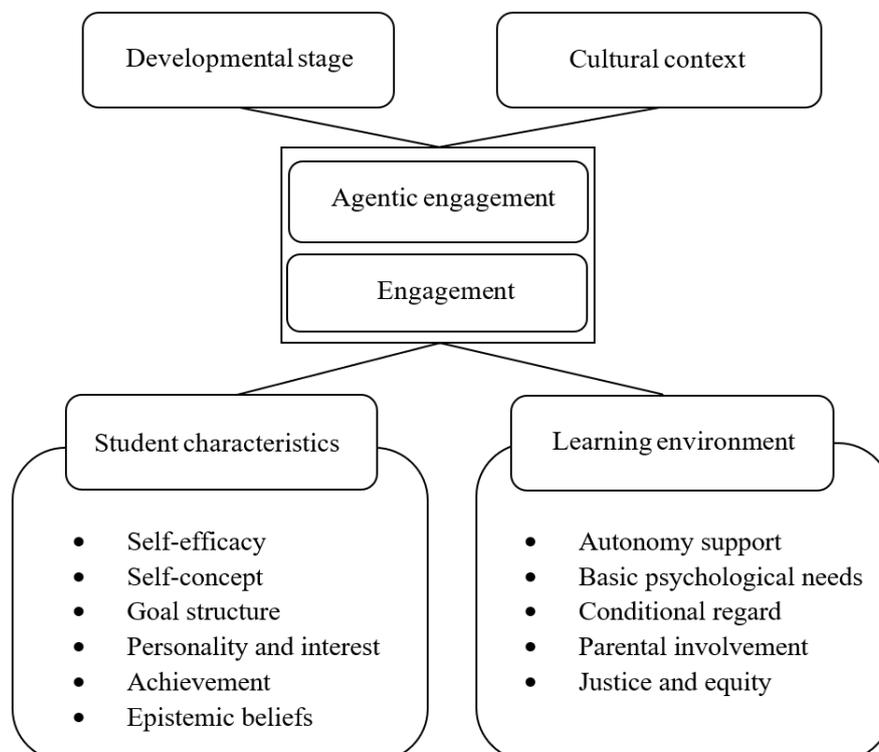


Figure 1 Constructs associated with engagement and agentic engagement (created by the authors)

Student individual characteristics and motivation. Motivation-related student characteristics were positively associated with agency. They included student self-efficacy, self-concept, mastery or performance goals orientation, level of achievement as well as personal interest in learning, and epistemic beliefs (for science subjects). Self-efficacy was found to predict cognitive, emotional (Tas, 2016), behavioural and agentic dimensions of engagement (Sokmen, 2021). The positive association was also true for students with mastery rather than performance goals (Ucar & Sungur, 2017) and higher ratings of self-concept (Veiga et al., 2015). Proactive personality and autonomous motivation (as opposed to controlled motivation, when students require teacher's structuring to stay motivated) also predicted agentic and behavioural engagement (Michou et al., 2021). However, agentic engagement could not reduce students' test anxiety (Maralani et al., 2018). In a temporal perspective, individual differences, such as personality and level of interest, accounted for fluctuations of student engagement throughout the study course (Michou et al., 2021, Patall et al., 2016; 2019). Interest was guiding student engagement in the beginning of the course, while approaching examinations strengthened the extrinsic motivation of students towards the end of the course (Patall et al., 2016). High prior achievement predicted engagement (Tas, 2016). However, Wan Mazwati (2018) described a case where low-achievers also demonstrated engagement when provided with agency-encouraging learning environment based on a philosophic inquiry class. Another variable analysed in the literature for its influence on student engagement was students' epistemic beliefs: uncertain epistemic beliefs and distrust in science may prevent students from fully engaging themselves in science learning (Lin, 2021a). Also, during lessons of communicative nature, such as language lessons, students faced the requirement to build social representations of oneself and could exercise agency to not to participate in activities as expected by the teacher (Henry & Thorsen, 2020).

Teaching-learning environment. In the reviewed studies, the classroom environment was addressed through the aspects of basic psychological needs fulfilment following SDT. Some studies reported a positive association of student basic psychological needs variable with dimensions of engagement (Kurt & Tas, 2018; Tas, 2016; Molinari & Mameli, 2018). Kurt and Tas (2018) revealed that parental involvement (high educational aspiration, parental communication, parental participation, and parental autonomy support) predicted satisfaction of basic psychological needs of students at school. A special focus lay on the reciprocity of student engagement and teacher autonomy support. When students perceived their teacher as interested and helpful, they reported significantly higher levels of agentic engagement (Reeve et al., 2020; Michou et al., 2021), while less supportive teacher behaviour was associated with less engaged students (Tas, 2016). Zhang et al. (2020) reported that an autonomy supportive teaching intervention had an effect on students' sense of autonomy and agentic

engagement, also the students admitted the changes in teacher's teaching style. At the same time, Patall et al. (2019) showed that students' reporting of agentic engagement predicted that they would perceive their teacher as affording autonomy. Thus, agentic engagement is both a predictor and a consequence of an autonomy supporting learning environment. Furthermore, Cohen et al. (2020) found that conditional regard as a motivating approach used by teachers opposed student sense of autonomy and prevented students from being agentially engaged. Also, students' perceived equity (Tas, 2016) and justice (Molinari & Mameli, 2018) in the classroom had a positive association with engagement.

Adolescence as a developmental stage. As the reviewed studies relied on the data collected from secondary and high school students, it was important to consider the specifics of their development according to their age. In a comparison of junior (grade 6-7) and middle adolescents (9-10), Veiga et al. (2015) noticed that younger students with high self-concept reported high levels of engagement, while older students with the same high self-concept tended not to become engaged cognitively and agentially. Authors noted that the increasing influence of peers could affect the willingness of adolescents to invest cognitively in learning tasks and show initiative in the classroom. This finding is essential to consider when planning learner agency promoting interventions. Besides, upper-secondary and high school level is where students start to think about their future career choice. Fulfilment of basic psychological needs can have an effect on students' self-efficacy in career decision-making (Mameli et al., 2019). In addition, teachers' motivating style directly impacts adolescents' classroom experience in academic and psychological terms (Cohen et al., 2020).

Cultural context considerations. As mentioned above, the findings in the reviewed studies stem from a variety of countries and cultures. Notably, several authors highlighted the possibilities of culture and local education systems effects (Molinari & Mameli, 2018; Zhang et al., 2020; Michou et al., 2021). Molinari and Mameli (2018) noted that in their sample of Italian students, autonomy dimension was not reported as a basic need at school by the students. Zhang et al. (2020) had similar expectations for the study in China, where the educational system is built to prepare students for exams rather than for interest pursuit and curricular outcomes. Consequentially, promotion of teacher autonomy support did not influence student cognitive engagement. Moreover, difference in agentic engagement and response to needs satisfaction by student gender requires further investigation for cultural effects (Michou et al., 2021).

Research instruments

Out of the reviewed 20 empirical papers, 16 papers used a quantitative approach to data analysis, three papers used qualitative methods, and one paper reported usage of mixed methods.

The majority of the quantitative studies compared differences in engagement between students, several studies applied a longitudinal perspective (Patall et al., 2016, 2019; Reeve et al., 2020; Michou et al., 2021). For measuring agentic engagement, the 5-item Agentic Engagement Scale (AES) was used. It was introduced and validated by Reeve and Tseng (2011) as part of the Engagement Questionnaire that distinguished agentic engagement as a dimension of engagement. In a later article (Reeve, 2013), AES items were revised to be more learning oriented (Table 3). Most of the reviewed quantitative studies relied either on the 2011 or 2013 version of AES. Several studies used adapted versions of the scale (Veiga et al., 2015; Lin, 2021a; 2021b). AES was translated into Turkish (Ucar & Sungur, 2017, 2018) and Italian (Mameli & Passini, 2017). The latter authors also extended the scale from 5 to 10 items and validated it in a subsequent study (Mameli & Passini, 2019; Table 3).

Table 3 Initial and revised Agentic Engagement Scale items (created by the authors)

Items of the initial AES (Reeve and Tseng, 2011)
<ul style="list-style-type: none"> - During class, I ask questions. - I tell the teacher what I like and what I don't like - I let my teacher know what I'm interested in - During class, I express my preferences and opinions - I offer suggestions about how to make the class better
Items of the revised AES (Reeve, 2013)
<ul style="list-style-type: none"> - During class, I ask questions to help me learn - I let my teacher know what I need and want. - I let my teacher know what I am interested in - During this class, I express my preferences and opinions - When I need something in this class, I'll ask the teacher for it
Items added to the extended version of AES (Mameli & Passini, 2019)
<ul style="list-style-type: none"> - During classes, it can happen that I introduce new issues or discussion topics - I defend my opinions even if they are not in line with those of my classmates - I make sure that my teacher understands if there is something I don't like - If I don't agree with a teacher's statement, I tell him or her - If I think that a teacher's behaviour is unfair, I tell him or her

As for the qualitative and mixed methods studies, they were less numerous and used varied research instruments. Pineda-Báez et al. (2019) conducted a qualitative study based on semi-structured small group interviews and student writings to identify the factors stimulating and hindering student engagement based on student own experience; the sample included 150 seventh-grade students (aged 12-13). Wan Mazwati (2018) described an observational case study where 22 low-achieving students aged 12-13 years took part in a philosophic inquiry-based discussion. The outlined pedagogy was reported to encourage student

engagement and agency. Contrary to the rest of the studies, Henry & Thorsen (2020) focused on student disengagement rather than engagement. They analysed two cases from 7th and 9th grades from a larger ethnographic project, where they attempted to describe the disaffected version of agency in a language class by providing examples of student interaction. The authors demonstrated how students “manipulated” the activities offered by the teacher, acting out “productive forms of disaffection” (Henry & Thorsen, 2020, p. 468). Zhang et al. (2020) carried out a quasi-experimental intervention study and combined the data from student self-reporting, classroom observations and interviews with teachers.

Overall, the reviewed empirical papers rarely studied agentic engagement on its own, rather together with other psychological constructs and teacher pedagogical approaches relying on quantitative student engagement reports, teacher ratings, interviews and classroom observations.

Implications for research on learning co-creation

The main areas where co-creation and agentic engagement overlap are student agency and productive interaction between teachers and students. Agentic engagement may reflect the process of learning co-creation on the daily individual student level by showing to what extent students feel involved in the organisation of learning in the classroom. The concepts are oriented at the collaborative processes for learning: agentic engagement is about how an individual can win a more supportive environment (Reeve, 2015), and the goal of co-creation is a collaborative output and value creation with shared responsibility for learning (Author et al., 2020). However, if co-creation is directed at involving students as partners or co-designers in the education process by inviting them to design activities, courses or curricula, agentic engagement describes student contribution to instruction as it is delivered by the teacher. In other words, co-creation is often discussed as a teacher or institution-initiated practice (top-bottom nature), while agentic engagement stems from the student (bottom-up nature), even if enabled by autonomy supporting teaching (Reeve et al., 2020). Thus, agentic engagement can be an element, a goal, or an outcome of co-creation.

The review has demonstrated that both individual characteristics of students and the influences from their proximal environment contribute to students’ engagement as a manifestation of their motivation for learning. In this way, a line of research could be developed on co-creation as an autonomy, and subsequently, motivation supporting approach. Additionally, agentic engagement can be considered as an indicator of whether co-creative activity had the desired effect on students’ active engagement. When discussing student agency, it is essential to look at to what degree learners can influence instruction and how productive and beneficial for learning this influence is. The reviewed studies tended to consider the association between agentic engagement and achievement in general,

however, it would be also informative to measure any effects of agency enhancing interventions on student achievement and cognitive engagement within certain time periods as suggested by Zhang et al. (2020). Moreover, there is still an open question about the relation between agentic engagement of students during classes and their self-regulated learning, as the latter is often conceptualised as highly agentic process in theory and practice (Schunk, 2012). A related direction would be also identifying the interrelation between agentic engagement and promotion of metacognitive strategies use in the classroom by the teacher.

In terms of the research instruments, the reviewed studies relied mostly on students' self-reports of engagement, only two studies reported a classroom observation (Henry & Thorsen, 2020; Zhang et al., 2020). In the context of studying co-creation, the quantitative tools could be used for measuring the agentic engagement as an indicator of co-creation. However, in line with the longitudinal studies from this review (Patall et al., 2016, 2019; Michou et al., 2021) an alternative could be to study student agency as a process rather than a static trait of students. In the context of self-regulated learning, such change of perspective on measurement was described as moving from aptitude-based measures to event-based ones (Panadero, Klug, & Järvelä, 2016). Previous studies on co-creation have shown that student questionnaires and think-aloud reports can yield different results (Fraile et al., 2017). Thus, there is a need for more qualitative and mixed-methods studies to account for the fine-grain changes in student engagement within specific contexts.

Conclusion

This paper aimed to map the available literature on agentic engagement in conceptual and methodological terms. The review showed that agentic engagement was studied predominantly in relation to motivational constructs and autonomy affording pedagogy. The majority of studies were quantitative, measuring association between agentic engagement, other dimensions of engagement and variables representing the individual characteristics of students. The concept of agentic engagement implied a perspective from the students' position with the literature focusing on increasing student motivation and engagement through satisfaction of students' basic psychological needs. Implications for the research on co-creation included a suggestion to study co-creation as an autonomy supporting approach and considering agentic engagement as an element or an indicator of learning co-creation. Current research instruments used for studying agentic engagement of students are based on the quantitative Agentic Engagement Scale (Reeve & Tseng, 2011; Reeve, 2013). The use of process-based research methods can be proposed for capturing event variations in student agency in the classroom.

Further research is needed to connect co-creative practices and supporting student agentic engagement with learning outcomes, student self-regulation and collaboration skills. Besides, as this review has demonstrated, the cultural context differences, as well as local practice conventions, can have an effect on student agency in learning and participation in co-creative activities. Thus, further studies need to take the cultural factors into account.

References

- Bandura, A. (2006). Toward a psychology of human agency. *Perspectives on Psychological Science*, 1(2), 164–180.
- Bovill, C. (2020). Co-creation in learning and teaching: The case for a whole-class approach in higher education. *Higher Education*, 79(6), 1023–1037. DOI: <https://doi.org/10.1007/s10734-019-00453-w>
- Bovill, C., Cook-Sather, A., Felten, P., Millard, L., & Moore-Cherry, N. (2016). Addressing potential challenges in co-creating learning and teaching: Overcoming resistance, navigating institutional norms and ensuring inclusivity in student-staff partnerships. *Higher Education*, 71(2), 195–208.
- Christenson, S. L., Reschly, A. L., & Wylie, C. (Eds.). (2012). *Handbook of Research on Student Engagement*. Springer US. DOI: <https://doi.org/10.1007/978-1-4614-2018-7>
- Cohen, R., Moed, A., Shoshani, A., Roth, G., & Kanat-Maymon, Y. (2020). Teachers' conditional regard and students' need satisfaction and agentic engagement: A multilevel motivation mediation model. *Journal of Youth and Adolescence*, 49(4), 790–803. DOI: <https://doi.org/10.1007/s10964-019-01114-y>
- Fraile, J., Panadero, E., & Pardo, R. (2017). Co-creating rubrics: The effects on self-regulated learning, self-efficacy and performance of establishing assessment criteria with students. *Studies in Educational Evaluation*, 53, 69–76. DOI: [10.1016/j.stueduc.2017.03.003](https://doi.org/10.1016/j.stueduc.2017.03.003)
- Henry, A., & Thorsen, C. (2020). Disaffection and agentic engagement: 'Redesigning' activities to enable authentic self-expression. *Language Teaching Research*, 24(4), 456–475. DOI: <https://doi.org/10.1177/1362168818795976>
- Kaminskiene, L., & Khetsuriani, N. (2019). Co-creation of learning as an engaging practice. *Society. Integration. Education. Proceedings of the International Scientific Conference*, 2, 191–199.
- Kaminskienė, L., Žydzūnaitė, V., Jurgilė, V., Ponomarenko, T. (2020). Co-creation of Learning: A Concept Analysis. *European Journal of Contemporary Education*, 9(2), 337–349. DOI: <https://doi.org/10.13187/ejced.2020.2.337>
- Kurt, U., & Tas, Y. (2018). The relationships between parental involvement, students' basic psychological needs and students' engagement in science: A path analysis. *Journal of Education in Science, Environment and Health*, 4(2), 183–192.
- Lin, T. (2021). High school students' epistemic knowledge profiles and their multifaceted learning engagement in science. *Research in Science & Technological Education*. DOI: <https://doi.org/10.1080/02635143.2021.1985446>
- Lin, T. (2021b). Multi-dimensional explorations into the relationships between high school students' science learning self-efficacy and engagement. *International Journal of Science Education*, 43(8), 1193–1207. DOI: <https://doi.org/10.1080/09500693.2021.1904523>
- Mameli, C., & Passini, S. (2017). Measuring four-dimensional engagement in school: A validation of the student engagement scale and of the agentic engagement scale. *TPM -*

- Testing, Psychometrics, Methodology in Applied Psychology*, 24(4), 527–541. DOI: <https://doi.org/10.4473/TPM24.4.4>
- Mameli, C., & Passini, S. (2019). Development and validation of an enlarged version of the student agentic engagement scale. *Journal of Psychoeducational Assessment*, 37(4), 450–463. DOI: <https://doi.org/10.1177/0734282918757849>
- Mameli, C., Molinari, L., & Passini, S. (2019). Agency and responsibility in adolescent students: A challenge for the societies of tomorrow. *British Journal of Educational Psychology*, 89(1), 41–56. DOI: <https://doi.org/10.1111/bjep.12215>
- Maralani, F., Shalhaf, A., & Lavasani, M. (2018). Agentic engagement and test anxiety: the mediatory role of the basic psychological needs. *Sage Open*, 8(2). DOI: <https://doi.org/10.1177/2158244018772884>
- Meinking, K.A., & Hall, E.E. (2020). Co-creation in the classroom: challenge, community, and collaboration. *College Teaching*, 68(4), 189–198. DOI: <https://doi.org/10.1080/87567555.2020.1786349>
- Michou, A., Altan, S., Mouratidis, A., Reeve, J., & Malmberg, L. (2021). Week-to-week interplay between teachers' motivating style and students' engagement. *Journal of Experimental Education*. DOI: <https://doi.org/10.1080/00220973.2021.1897774>
- Molinari, L., & Mameli, C. (2018). Basic psychological needs and school engagement: A focus on justice and agency. *Social Psychology of Education*, 21(1), 157–172. DOI: <https://doi.org/10.1007/s11218-017-9410-1>
- Panadero, E., Klug, J., & Järvelä, S. (2016). Third wave of measurement in the self-regulated learning field: When measurement and intervention come hand in hand. *Scandinavian Journal of Educational Research*, 60(6), 723–735. DOI: <https://doi.org/10.1080/00313831.2015.1066436>
- Patall, E., Pituch, K., Steingut, R., Vasquez, A., Yates, N., & Kennedy, A. (2019). Agency and high school science students' motivation, engagement, and classroom support experiences. *Journal of Applied Developmental Psychology*, 62, 77–92. DOI: <https://doi.org/10.1016/j.appdev.2019.01.004>
- Patall, E., Vasquez, A., Steingut, R., Trimble, S., & Pituch, K. (2016). Daily interest, engagement, and autonomy support in the high school science classroom. *Contemporary Educational Psychology*, 46, 180–194. DOI: <https://doi.org/10.1016/j.cedpsych.2016.06.002>
- Pineda-Baez, C., Manzuoli, C., & Sanchez, A. (2019). Supporting student cognitive and agentic engagement: Students' voices. *International Journal of Educational Research*, 96, 81–90. DOI: <https://doi.org/10.1016/j.ijer.2019.06.005>
- Reeve, J. (2012). A self-determination theory perspective on student engagement. In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of Research on Student Engagement* (pp. 149–172). Springer US. DOI: <https://doi.org/10.1007/978-1-4614-2018-7>
- Reeve, J. (2013). How students create motivationally supportive learning environments for themselves: The concept of agentic engagement. *Journal of Educational Psychology*, 105(3), 579–595. DOI: <https://doi.org/10.1037/a0032690>
- Reeve, J. (2015). Giving and summoning autonomy support in hierarchical relationships. *Social and Personality Psychology Compass*, 9(8), 406–418. DOI: <https://doi.org/10.1111/spc3.12189>
- Reeve, J., & Tseng, C.-M. (2011). Agency as a fourth aspect of students' engagement during learning activities. *Contemporary Educational Psychology*, 36(4), 257–267. DOI: <https://doi.org/10.1016/j.cedpsych.2011.05.002>

- Reeve, J., Cheon, S., & Yu, T. (2020). An autonomy-supportive intervention to develop students' resilience by boosting agentic engagement. *International Journal of Behavioral Development, 44*(4), 325–338. DOI: <https://doi.org/10.1177/0165025420911103>
- Ryan, R.M., & Deci, E.L. (2017). *Self-determination theory: Basic psychological needs in motivation development and wellness*. Guilford Press.
- Schunk, D.H. (2012). Social cognitive theory. In K.R. Harris, S. Graham, T. Urdan, C.B. McCormick, G.M. Sinatra, & J. Sweller (Eds.), *APA educational psychology handbook, Vol 1: Theories, constructs, and critical issues*. (pp. 101–123). American Psychological Association. DOI: <https://doi.org/10.1037/13273-005>
- Sokmen, Y. (2021). The role of self-efficacy in the relationship between the learning environment and student engagement. *Educational Studies, 47*(1), 19–37. DOI: <https://doi.org/10.1080/03055698.2019.1665986>
- Tas, Y. (2016). The contribution of perceived classroom learning environment and motivation to student engagement in science. *European Journal of Psychology of Education, 31*(4), 557–577. DOI: <https://doi.org/10.1007/s10212-016-0303-z>
- Ucar, F., & Sungur, S. (2017). The role of perceived classroom goal structures, self-efficacy, and engagement in student science achievement. *Research in Science & Technological Education, 35*(2), 149–168. DOI: <https://doi.org/10.1080/02635143.2017.1278684>
- Ucar, F., & Sungur, S. (2018). Adaptation of engagement questionnaire to Turkish for science classes: Validity and reliability study. *Elementary Education Online, 17*(3), 1691–1705. DOI: <https://doi.org/10.17051/ilkonline.2018.466419>
- Veiga, F., Garcia, F., Reeve, J., Wentzel, K., & Garcia, O. (2015). When adolescents with high self-concept lose their engagement in school. *Revista de Psicodidactica, 20*(2), 305–320. <https://doi.org/10.1387/RevPsicodidact.12671>
- Wan Mazwati, W. (2018). The impact of philosophical inquiry method on classroom engagement and reasoning skills of low achievers. *Journal of Curriculum and Teaching, 7*(1), 135–146.
- Zawacki-Richter, O., Kerres, M., Bedenlier, S., Bond, M., & Buntins, K. (2020). *Systematic Reviews in Educational Research*. Wiesbaden: Springer VS.
- Zhang, D., Bobis, J., Wu, X., & Cui, Y. (2020). The effects of an autonomy-supportive teaching intervention on Chinese physics students and their teacher. *Research in Science Education, 50*(2), 645–671. <https://doi.org/10.1007/s11165-018-9706-y>