

## **Systematic Review of Student Engagement Instruments in Higher Education: Evaluating Reliability, Applicability, and Comprehensive Coverage Across Diverse Factors**

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### **Abstract**

Numerous student engagement instruments have been introduced in higher education (Heilporn et al., 2024), yet selecting an instrument that effectively addresses the key areas of student engagement, including behavior, cognitive, emotions, social interactions, and active participation remains a challenge. This paper aims to examine the recent research on student engagement instruments in higher education, identifying their strengths and weaknesses using PRISMA guidelines. A literature search conducted in the Scopus database resulted in the inclusion of 23 articles. These articles traced back 17 different types of instrument questionnaires to their original sources, which were then examined. The findings reveal that all instruments exhibit high reliability and are suitable for both male and female students. Additionally, most instruments, specifically 78% are appropriate for university-level education and 61% of the instruments are appropriate for any course. However, significant weaknesses were identified. 78% of the instruments are not applicable across all course modalities, 61% are not suitable for all age groups, and 61% percent do not apply to all faculties. Among the reviewed instruments, one stands out for its inclusiveness and high reliability. It effectively supports students of all ages, genders, subjects, faculties, and course modalities at the university level while comprehensively covering the five dimensions of student engagement. This review highlights the need for more inclusive and adaptable instruments in higher education to ensure comprehensive measurement of student engagement across diverse contexts.

*Keywords:* multi-dimensional student engagement, student engagement instrument, higher education

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## Introduction

In the complex journey of academic learning, students engage in both academic studies and various extracurricular activities. This experience enriches their educational journey, fostering overall development, growth, and economic advancement (Buckley & Lee, 2021; Heilporn et al., 2024; Munir et al., 2023; Reschly & Christenson, 2022). Achieving academic excellence is needed for students to position themselves in the favorable position in the job market and make meaningful contributions to society (Karim et al., 2016). Academic performance acts as a gauge of a student's readiness to face the challenges of the professional world and succeed in their chosen endeavors. However, while academic performance remains a critical indicator of success, it alone does not fully capture the complexities of a student's potential. This broader understanding of success necessitates a deeper exploration of factors like student engagement, which plays a pivotal role in shaping academic and life outcomes.

Student engagement, which encompasses cognitive (thinking), emotional (feeling), behavioral (acting), social (interacting with peers), and agentic (contributing actively) dimensions, is essential for enhancing academic achievement (Heilporn et al., 2024). It is a significant predictor of students' academic performance and plays a crucial role in assessing the quality of teaching and learning processes (Iter & Salhab, 2024). Research has increasingly highlighted that the importance of student engagement, demonstrating its strong connection to student education outcome such as student learning, academic achievement, satisfaction, persistence, sense of community, high dropout rates, high level of student boredom and disaffection (Adams et al., 2020; Cents-Boonstra et al., 2021; Hart et al., 2011; Heilporn et al., 2024a; Li & Xue, 2023; Niittylahti et al., 2019). Thus, student engagement emerges as a key predictor of academic achievement and behavior, offering valuable insights for shaping effective educational practices.

Numerous student engagement models and measurement scales have been developed to assess engagement levels, enriching the field (Maroco et al., 2016; Reeve & Tseng, 2011; Zhoc et al., 2019). However, although many types of student engagement instruments have been introduced over the past several years, there remain a need to evaluate their reliability and usability across different educational contexts. A systematic review is essential to determine whether these instruments are suitable for all ages of students, useable across various faculties and courses, and compatible with different modalities of learning. The systematic review also examines the reliability of these instruments in accurately measuring student engagement within the context of higher education.

This study systematically reviews student engagement measures in higher education in terms of age, genders, course modalities (e.g. face-to-face, online and blended learning), across various faculties and university levels. This study follows the PRISMA guidelines and seeks to answer the following questions:

1. Which student engagement instruments are most frequently used in recent academic research?
2. What validated instruments are recommended for measuring student engagement?

## Literature Review

Student engagement is identified as a complex and multidimension concept (Abbasi et al., 2023; Heilporn et al., 2024; Huang et al., 2022; Luan et al., 2020). The facets of student engagement is behavioral (acting), cognitive (thinking), and emotional (feeling)—is broadly

recognized within scholarly literature (Abbasi et al., 2023; Gladstone et al., 2022; Heilporn et al., 2024; Huang et al., 2022; Reschly & Christenson, 2022). Nonetheless, scholars have proposed the expansion of the framework to incorporate additional dimensions, such as social engagement, agentic engagement, collaborative engagement, and psychological engagement (Choong Foong et al., 2022; Linnenbrink-Garcia et al., 2011; Reeve & Tseng, 2011; Yulia et al., 2020).

Behavioral engagement refers to the observable actions and commitment that students demonstrate in the learning session activities. It involves participation in learning activities such as participation in classes, completing assignments, engaging in group discussions, and asking questions (Abbasi et al., 2023; Heilporn et al., 2024; Marôco et al., 2020; Ramírez Hernández et al., 2024). Focusing on behavioral engagement enables educators to tackle the challenge to student participation and adopt effective strategies to facilitate active learning and enhance academic performance (Heilporn et al., 2024; Liu et al., 2023).

Cognitive engagement, which significantly impacts students' ability to process and understand complex knowledge, refers to the mental investment and effort that learners put into understanding and mastering challenging learning materials (Abbasi et al., 2023; Marcionetti & Zammitti, 2023). This requires the use of cognitive and metacognitive strategies, as well as deep processing, in order to reach a higher level of knowledge understanding (Abbasi et al., 2023; Heilporn et al., 2024; Liu et al., 2023; Yuyun, 2023). Students who are cognitively engaged are motivated to go beyond merely understanding basic knowledge gained from the learning session. They will employ deeper cognitive strategies and showing persistence when faced with difficulty in mastering more complex skills (Han & Huang, 2022; Marcionetti & Zammitti, 2023).

Emotional engagement refers to students' emotional response of student toward school, teachers, and peers (Abbasi et al., 2023; Choong Foong et al., 2022; Han & Huang, 2022; Roy et al., 2023; Ze & Molinari, 2021; Yau & Shu, 2023; Yulia et al., 2020). Emotional engagement comprises students' positive (enthusiasm, pride, interest, enjoyment in school) and negative (boredom, frustration, anxiety, disinterest) feeling towards their teachers, institution, and peers (Abbasi et al., 2023; Adams et al., 2020; Fredricks et al., 2004; Han & Huang, 2022; Hart et al., 2011; Okla et al., 2023).

Social engagement offers the advantage of distinguishing itself from emotional engagement, as some more introverted students may be emotionally engaged in a course without interacting or bonding with their peers (Heilporn et al., 2024). The most fitting definition for this study describes social engagement as students' positive interactions with peers and their sense of belonging within the group (Heilporn et al., 2024).

Agentic engagement, recognized as the fourth aspect of student engagement, refers to the constructive contributions students make to the flow of their learning session. It encompasses what students say and do to enhance their own learning environment, such as offering input, expressing preferences, and seeking out interesting and engaging activities (Reeve & Jang, 2022). Students who shape and enrich the quality of their learning experience through the exercise of autonomy and proactiveness often contribute to more effective teaching and engaging activities during learning sessions, as well as gain access to more resources. The concept of agentic engagement is essential, as it focuses on students' proactive role in shaping both the content and context of their learning (Heilporn et al., 2024; Reeve & Jang, 2022; Reeve & Shin, 2020).

## **Methodology**

### ***Information Sources***

An extensive search was conducted on 1st May 2024 via the Universiti Malaysia Pahang Al-Sultan Abdullah (UMPSA) e-Resource Library system (exprozy) to obtain articles concerning student engagement in higher education from the Scopus databases.

### ***Search Strategy***

There were two primary search terms: "student engagement" and "higher education". However, to refine the search and ensure a direct connection with student engagement, priority was given to articles with "engagement" in their titles. To refine the search and ensure a direct focus on student engagement, priority was given to articles that contained the word 'engagement' in their title. To broaden the search scope and to encompass other relevant literature, other words that relate to engagement were also added to the search terms in an attempt to widen the scope of the research. The search keyword used in Scopus database is ("student engagement" OR "learner engagement") AND ("higher education" OR university OR college).

### ***Eligibility Criteria***

To ensure the quality of the literature collection, articles were selected based on specific criteria. Only articles published between 2020 and 2024, written in English, and with open access accessibility were included. Conference papers, book chapters, reviews, and books were excluded from consideration.

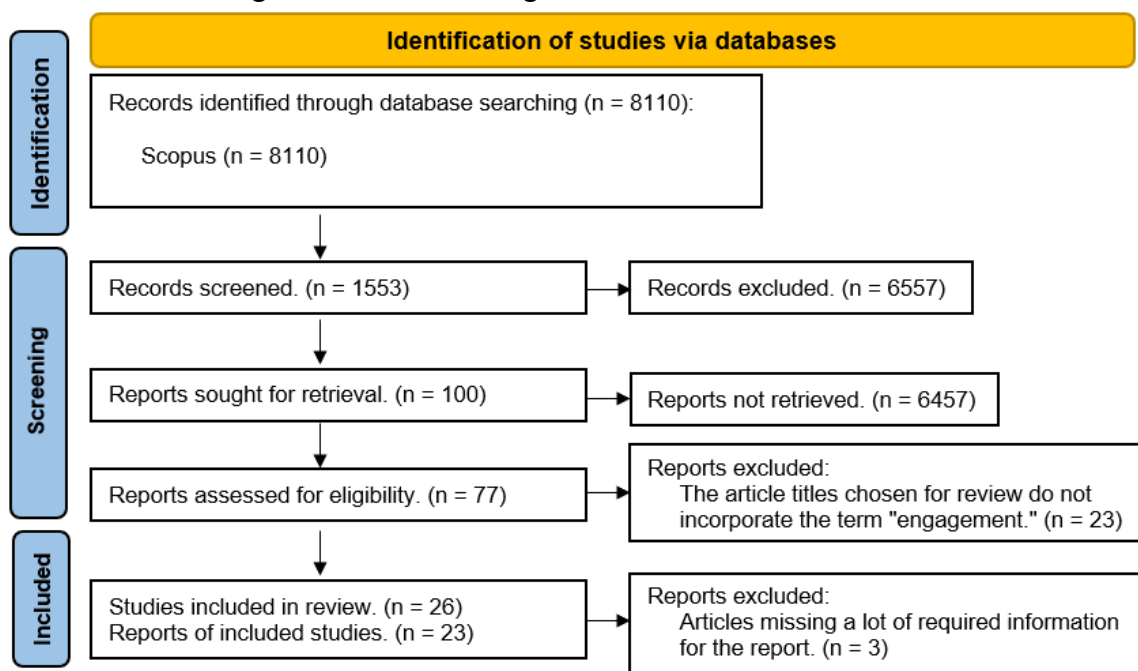
### ***Screening Process***

The article retrieval process through Scopus began with the identification phase, generating 8,110 articles based on specified keywords. The screening phase involved three sub-steps. Initially, 6,557 articles were excluded through applied filters, reducing the count to 1,553. From these, the top 100 most relevant articles were selected for further screening, and 23 articles that did not include the term "engagement" in their titles were removed, leaving 77 eligible articles.

In the inclusion phase, abstracts and full texts of the remaining 77 articles were reviewed, resulting in 26 initially suitable articles. However, three articles were excluded due to missing information, leading to a final selection of 23 articles. The screening process evaluated articles based on their titles, abstracts, and full texts against the inclusion criteria. A total of 51 articles were excluded as they did not measure any of the five types of student engagement: behavioural, cognitive, emotional, social, and agentic, or lacked the use of student engagement questionnaires in higher education contexts.

This rigorous selection process ensured the inclusion of only relevant articles, meeting the specified criteria. The details of the screening process are presented in Figure 1.

Figure 1: PRISMA Diagram - Article Retrieval Process



## Results

1. Which student engagement instruments are most frequently used in recent academic research?

Out of the 17 student engagement instruments reviewed, the University Student Engagement Inventory (USEI) was the frequently adopted instrument where it is being featured in five studies. Following USEI, the Higher Education Student Engagement Scale (HESES) and the Student Engagement Questionnaire (SEQ) were the second most commonly used with each appearing in three studies. Alternatively, other instruments, such as the Online Classroom Engagement Questionnaire (OCEQ) and the Multidimensional Scale of Student Engagement in Higher Education (MSSEC), were only employed once. The employment of these instruments, in order of their frequency, is presented in Figure 2. Figure 3 illustrates that USEI accounts for 21.7% of all instrument usage, highlighting a significant gap between the top three instruments and the rest.

Over the past five years, the usage of the USEI has been marked by ups and downs. It was utilized only once in 2020, had no recorded uses of it in 2021, was utilized twice in 2022, marking an increase, and then declined slightly to a single use in both 2023 and 2024. The high rate of adoption of USEI can be attributed to its well-established reliability and broad coverage of engagement facets, which form the basis of the multidimensional student engagement concept, including behavioral, cognitive, and emotional engagement (Maroco et al., 2016; Marôco et al., 2020). Besides, USEI has also been tested for measurement invariance by fields of study and gender, reliability, and factorial validity but only with Portuguese-speaking students (Marôco et al., 2020).

USEI is more commonly used in European studies whereas HESES and SEQ are more prevalent in Asian studies. While HESES is not as widely used as USEI, it remains relatively utilized, with two studies uses. Its frequent use is attributed to its high reliability, as reflected

in the Cronbach's  $\alpha$  values ranging from 0.70 to 0.87 across all the dimensions. HESES demonstrates strong reliability in measuring student engagement with Cronbach's  $\alpha = 0.914$ . One of the major strengths of HESES is its applicability in online learning environments, making it a flexible tool for measuring student engagement in virtual contexts. In addition, unlike most other engagement measures, HESES has four distinct dimensions: academic, cognitive, emotional, and social engagement (with teachers and peers) (Zhoc et al., 2019).

SEQ, although not as widely utilized as the others, demonstrates superb internal consistency with Cronbach's  $\alpha = 0.97$  (Reeve & Tseng, 2011). This instrument assesses four engagement dimensions: behavioral, agentic, cognitive, and emotional engagement. While other instruments, such as SES-4DS/HEV, also assess these four dimensions, SES-4DS/HEV has a lower reliability score of  $\alpha = 0.82$ , making SEQ a more robust choice in this category.

Despite their strengths, some instruments have seen limited adoption. OCEQ and MSSEC, though methodologically sound, have not been widely implemented, likely due to their recent development. OCEQ was introduced in 2023, and MSSEC was introduced in 2024, which may explain their lower adoption rates. OCEQ is based on the multidimensional engagement framework, covering behavioral, cognitive, and emotional engagement, but it contains 54 items, making it significantly longer than many other instruments (Abbasi et al., 2023). Any questionnaire exceeding 30 items is generally considered long, and lengthy instruments tend to have a higher nonresponse rate (Sharma, 2022). This can lead to challenges such as missing data, data trimming, or data imputation, depending on the extent of the missing responses (Sharma, 2022). Furthermore, OCEQ is designed specifically for English as a Foreign Language (EFL) course, limiting its applicability to a broader range of subjects.

MSSEC, being the most recent instrument, has yet to gain widespread recognition, as it was introduced only in 2024. However, given its design and potential applicability, it may become a more frequently used tool in the future as more studies assess its validity and reliability.

Overall, while USEI remains the most widely used student engagement instrument, HESES and SEQ are also frequently implemented due to their high reliability and multidimensional engagement frameworks. Meanwhile, newer instruments such as OCEQ and MSSEC hold promise but require further validation and adoption in research studies.

Figure 2: The Most Frequently Used Instruments In Recent Academic Research Sorted by Usage

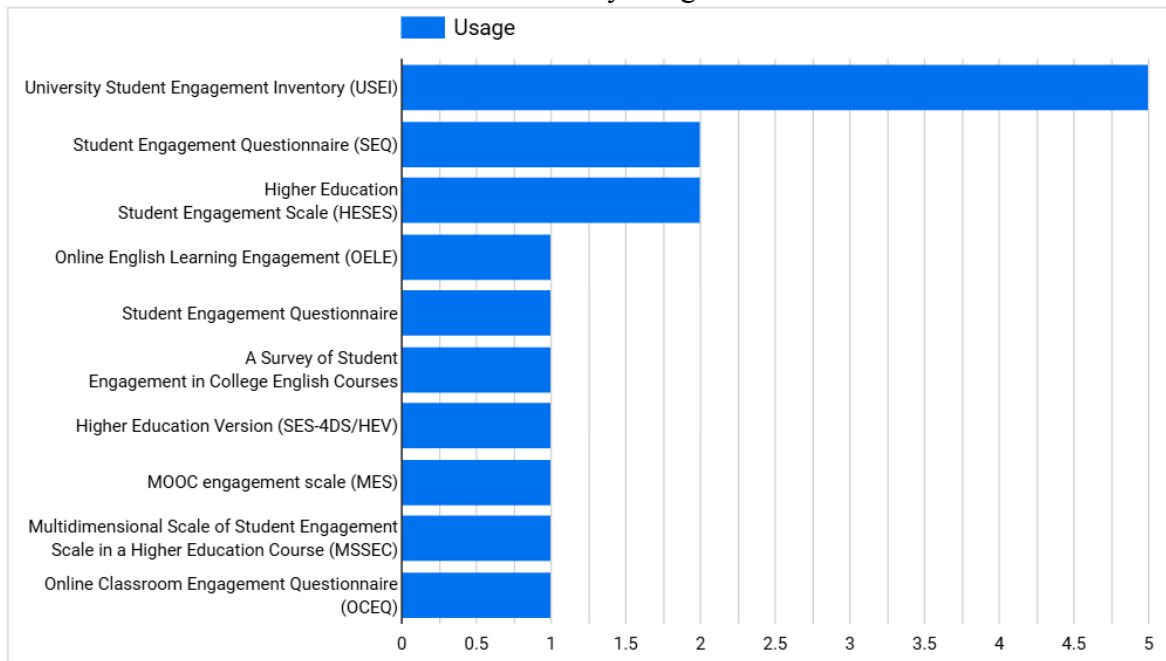
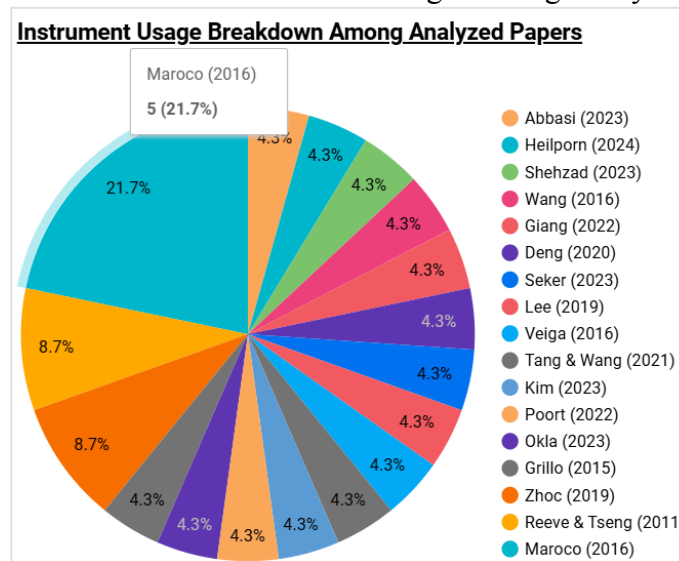


Figure 3: Breakdown of Instrument Usage Among Analyzed Papers



2. What validated instruments are recommended for measuring student engagement?

Among the 17 student engagement instruments analyzed, MSSEC demonstrated the highest reliability across multiple dimensions, with Cronbach’s  $\alpha$  values ranging from 0.86 to 0.95 (see Table 2). It is also the only instrument applicable across course modalities. MSSEC is well-suited for university-level education, adaptable across various learning modalities such as face-to-face, online, and blended learning. It is applicable to all courses and faculties, inclusive of all age groups and genders, and demonstrates high reliability. Table 1 presents a comparative analysis of widely used student engagement instruments, highlighting their applicability across different factors. As shown, MSSEC is the only tool that meets all key criteria. Furthermore, Table 3 outlines the limitations of the 17 analysed student engagement

instruments, where MSSEC stands out as the only instrument without notable constraints. This further highlights its robustness and versatility in diverse educational settings.

MSSEC is the first instrument designed to measure student engagement in a higher education course while incorporating the five well-known dimensions of engagement: behavioural, cognitive, emotional, social, and agentic. Validity evidence has been provided across various course modalities, faculties, and university levels. The instrument can be used at any time during a semester to assess student engagement, allowing instructors to adjust their teaching strategies accordingly. Additionally, MSSEC offers a detailed assessment of the stability of its factor structure across different university levels, genders, age groups, and course delivery methods.

Among the analyzed instruments, the MSSEC stands out as the shorter and comprehensive instrument for measuring student engagement. This is because it is the only instrument that covers all five dimensions with only 27 questionnaire items. Educators benefit from their efficiency as it can provide valuable insights into students' learning experiences from the perspective of student engagement dimensions while requiring only a few minutes for students to complete the questionnaire. It can therefore be termed as a practical tool to be applied. MSSEC demonstrates strong reliability, as indicated by high Cronbach's alpha values across all dimensions. Table 4 presents the reliability (Cronbach's  $\alpha$ ) of MSSEC by engagement dimensions, highlighting its good internal consistency.

One more distinguishing characteristic of MSSEC is its generalizability across course modalities including face-to-face, online, and blended modes of learning. Among all the tools that have been reviewed, MSSEC is the only one capable of measuring student engagement efficiently in all these various types of learning environments. Other instruments, for instance HESES, USEI, SEQ, and OCEQ are valuable but less adaptable and not as widely generalizable across faculties as MSSEC.

MSSEC's construct validity has been evidenced through confirmatory factor analyses, internal consistency, and multi-group comparisons. A first-order model with four correlated factors appeared to be the best fitting model to the data, with good internal consistency for all engagement dimensions. Multi-group confirmatory factor analyses also confirmed the partial invariance of the scale across gender, age (non-traditional and traditional students), university levels (undergraduate and graduate), and course modalities (face-to-face, blended, and online).

From a multidimensional psychological perspective, the improved version of MSSEC offers a robust and reliable tool for measuring student engagement in higher education courses. It provides detailed and meaningful insights for researchers, educators, and students alike, making it a valuable instrument for enhancing learning experiences. While other engagement instruments offer some useful features, MSSEC stands out as the most comprehensive and adaptable tool for assessing student engagement across diverse educational settings.

Table 1: Comparative Analysis of Student Engagement Instruments Among the Most Frequently Used Tools

	MSSEC	HESES	USEI	SEQ	OCEQ	OELE	SES-4DS/HEV
Appropriate for University Level Education	Y	Y	Y	N	Y	N	N
Usable Across Course Modalities	Y	Y	N	N	N	N	N
Appropriate for Any Courses	Y	N	Y	Y	N	N	N
Suitable for All Faculties	Y	Y	N	N	N	N	N
Applicable to All Age Group	Y	N	N	N	N	N	N
Applicable to All Genders	Y	Y	Y	Y	Y	Y	Y
High Reliability	Y	Y	Y	Y	Y	Y	Y

Note: Y (Yes), N (No).

Table 2: Reliability and Item Distribution of the MSSEC Across Engagement Dimensions

Dimension	Behavioral	Cognitive-Emotional	Social	Agentic
Number of Items	6	9	5	7
Cronbach's $\alpha$	0.91	0.95	0.91	0.86

Table 3: Limitations of Analyzed Student Engagement Instruments

No.	Instrument Name	Authors	Limitations
1	Online Classroom Engagement Questionnaire (OCEQ)	(Abbasi et al., 2023)	<ul style="list-style-type: none"> <li>• Not usable across course modalities</li> <li>• Not applicable to all age groups.</li> <li>• Not suitable for any courses</li> <li>• Not suitable for all faculties.</li> <li>• Questionnaire length exceeds 30 items</li> </ul>
2	Multidimensional Scale of Student Engagement Scale in a Higher Education Course (MSSEC)	(Heilporn et al., 2024)	<ul style="list-style-type: none"> <li>• None</li> </ul>
3	Student Engagement Questionnaire (SEQ)	(Reeve & Tseng, 2011)	<ul style="list-style-type: none"> <li>• Not usable across course modalities.</li> <li>• Not appropriate for university-level education.</li> <li>• Not applicable to all age groups.</li> <li>• Not suitable for all faculties.</li> </ul>

No.	Instrument Name	Authors	Limitations
4	Student Engagement Questionnaire (Unnamed)	(Grillo & Damacena, 2015)	<ul style="list-style-type: none"> <li>• Not usable across course modalities.</li> <li>• Not suitable for all faculties.</li> </ul>
5	MOOC Engagement Scale (MES)	(Deng et al., 2020)	<ul style="list-style-type: none"> <li>• Not usable across course modalities.</li> <li>• Not appropriate for university-level education.</li> <li>• Not suitable for all faculties.</li> </ul>
6	Higher Education Student Engagement Scale (HESES)	(Zhoc et al., 2019)	<ul style="list-style-type: none"> <li>• Not applicable to all age groups.</li> <li>• Not suitable for any courses</li> <li>• Questionnaire length exceeds 30 items</li> </ul>
7	Online English Learning Engagement (OELE)	(Wang et al., 2016)	<ul style="list-style-type: none"> <li>• Not usable across course modalities.</li> <li>• Not applicable to all age groups.</li> <li>• Not suitable for any courses</li> <li>• Not appropriate for university-level education.</li> <li>• Not suitable for all faculties.</li> <li>• Questionnaire length exceeds 30 items</li> </ul>
8	Student Engagement Questionnaire (Unnamed)	(Okla et al., 2023)	<ul style="list-style-type: none"> <li>• Not usable across course modalities.</li> <li>• Not suitable for all faculties.</li> </ul>
9	Student Engagement Questionnaire	(Giang et al., 2022)	<ul style="list-style-type: none"> <li>• Not usable across course modalities.</li> <li>• Not suitable for all faculties.</li> </ul>
10	University Student Engagement Inventory (USEI)	(Maroco et al., 2016)	<ul style="list-style-type: none"> <li>• Not usable across course modalities.</li> <li>• Not applicable to all age groups.</li> <li>• Not suitable for all faculties.</li> </ul>
11	Student Engagement Questionnaire (Unnamed)	(ŞEKER, 2023)	<ul style="list-style-type: none"> <li>• Not usable across course modalities.</li> <li>• Not applicable to all age groups.</li> <li>• Not suitable for any courses</li> <li>• Questionnaire length exceeds 30 items</li> </ul>
12	Student Engagement Questionnaire (Unnamed)	(Shehzad & Charles, 2023)	<ul style="list-style-type: none"> <li>• Not usable across course modalities.</li> <li>• Not suitable for any courses</li> </ul>

No.	Instrument Name	Authors	Limitations
13	Higher Education Version (SES-4DS/HEV)	(Veiga, 2016)	<ul style="list-style-type: none"> <li>• Not usable across course modalities.</li> <li>• Not applicable to all age groups.</li> <li>• Not appropriate for university-level education.</li> <li>• Not suitable for all faculties.</li> <li>• Not suitable for any courses</li> </ul>
14	A Survey of Student Engagement in College English Courses	(Teng & Wang, 2021)	<ul style="list-style-type: none"> <li>• Not usable across course modalities.</li> <li>• Not suitable for any courses</li> <li>• Questionnaire length exceeds 30 items</li> </ul>
15	Student Engagement Questionnaire (Unnamed)	(Kim et al., 2023)	<ul style="list-style-type: none"> <li>• Not usable across course modalities.</li> <li>• Not applicable to all age groups.</li> </ul>
16	Student Engagement Questionnaire (Unnamed)	(Poort et al., 2022)	<ul style="list-style-type: none"> <li>• Designed to assess engagement in group work</li> </ul>
17	Student Engagement Questionnaire (Unnamed)	(Lee et al., 2019)	<ul style="list-style-type: none"> <li>• Not usable across course modalities.</li> <li>• Not suitable for any courses</li> <li>• Questionnaire length exceeds 30 items</li> </ul>

## Conclusion

The findings indicate that the University Student Engagement Inventory (USEI) is still the most frequently utilized instrument for measuring student engagement at the university level. It is frequently used, likely to be attributable to its high reliability and widely established validity on a range of dimensions, more in European contexts. The widespread adoption of the USEI is attributed to its ability to holistically measure the key dimensions of student engagement: behavioural, cognitive, and emotional. Nevertheless, since its validation is confined to Portuguese-speaking populations, its applicability to other academic context remains constraints. Despite that, HESES and SEQ have been widely adopted in Asian studies. HESES is unique in its flexibility to measure engagement particularly for the social interaction with teachers and peers regardless of the basis of student engagement dimension, whereas SEQ excel in measuring agentic dimension even though it measures the basis of student engagement dimension, along with the fact that it also possesses a significantly second highest reliability score, being Cronbach  $\alpha = 0.967$ , which makes it a strong option for measuring student engagement. In spite of their strengths, these instruments have certain limitations; for instance, HESES do not have agentic involvement, while SEQ do not encompass social involvement. This is a limitation of both HESES and SEQ, as increasingly more evidence is demonstrating that student engagement also encompasses an agentic aspect and social involvement (Gladstone et al., 2022).

Less developed instruments, such as OCEQ and the MSSEC, have yet to see extensive use, primarily due to their recent development. The OCEQ, introduced in 2023, offers a multidimensional engagement measure; yet it consists of 54 items, making it longer than other measures, which is something that may contribute to reduced response rates. Furthermore, OCEQ is specifically intended for EFL learning, which hinders its widespread adoption. On the other hand, MSSEC, introduced in 2024, is a promising instrument due to its flexibility across various course modes, faculties, and student groups. The ability of the instrument to assess behavioral, cognitive, emotional, social, and agentic aspects of engagement makes it one of the most comprehensive measures of engagement. Nevertheless, as it is still in its early phase, additional studies are necessary to confirm its efficacy in various academic and cultural contexts.

Among the evaluated instruments, MSSEC is the most recommended measure for measuring student engagement in higher education. It has notable strengths over existing instruments because of its high reliability, ranging from Cronbach's  $\alpha$  of 0.86 to 0.95, its versatility across various modes of course delivery, including face-to-face, online, and blended courses, as well as due to its wide applicability across various faculties and student groups. In comparison to the USEI that is not fully validated across various learning modalities, the MSSEC is a more comprehensive measure of engagement, thus being a valuable tool for both teachers and researchers. Further, the brevity of MSSEC (27 items) offers a better chance of response than longer questionnaires such as OCEQ. This enhances practicality while also making it more student-friendly, helping to minimize survey fatigue and reduce non-response rates.

The findings offer valuable information for educators and researchers in selecting a suitable student engagement instrument to measure the student learning experience. Given its adaptability, the MSSEC can serve as a more widely marketed substitute, especially for institutions providing courses in multiple formats. Policymakers and higher education institutions can integrate the MSSEC instrument into learning sessions by encouraging students to engage in self-reflection after each session. This approach enables institutions to gain valuable insights through the collection of real-time learning experience data. Based on these insights, institutions can develop strategies to enhance the student learning experience and thereby limit dropout rates. There are several limitations of this research that must be acknowledged. The research was restricted to published articles, meaning that unpublished research, institutional reports, or corporate studies may reveal other patterns not evident here. Further, the number of studies included was restricted to 17 instruments, and they may not epitomize the whole scenario of all the existing student engagement measuring instruments. Some instruments can also be underreported due to the language barrier, since papers printed in a non-English language were excluded.

Future research should examine some key areas to enhance the understanding of instruments used to measure student engagement. In addition, future research should emphasize comparing the performance of student engagement tools in different educational settings, including those related to STEM versus humanities fields and online versus face-to-face instructional environments. Additionally, more validation studies are needed to evaluate the MSSEC in different countries and educational contexts, confirming its broader relevance and reliability.

### **Declaration of Generative AI and AI-Assisted Technologies in the Writing Process**

During the preparation of this work the author(s) used Chat GPT in order to improve readability and language of the work. After using this tool, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the publication.

## References

- Abbasi, M., Ghamoushi, M., & Mohammadi Zenouzagh, Z. (2023). EFL learners' engagement in online learning context: development and validation of potential measurement inventory. *Universal Access in the Information Society*, 23, 1467-1481. <https://doi.org/10.1007/s10209-023-00993-0>
- Adams, D., Joo, M. T. H., Sumintono, B., & Pei, O. S. (2020). Blended learning engagement in higher education institutions: A differential item functioning analysis of students' backgrounds. *Malaysian Journal of Learning and Instruction*, 17(1), 133–158. <https://doi.org/10.32890/mjli2020.17.1.6>
- Al Okla, N., Rababa, E. K., Belbase, S., & Murshidi, G. Al. (2023). The Influence of Collaboration, Participation, and Experience on Undergraduate Learner Engagement in the Online Teaching-Learning Environment. *Online Learning Journal*, 27(3), 155–187. <https://doi.org/10.24059/olj.v27i3.3505>
- Appleton, J. J., Christenson, S. L., Kim, D., & Reschly, A. L. (2006). Measuring cognitive and psychological engagement: Validation of the Student Engagement Instrument. *Journal of School Psychology*, 44(5), 427–445. <https://doi.org/10.1016/j.jsp.2006.04.002>
- Buckley, P., & Lee, P. (2021). The impact of extra-curricular activity on the student experience. *Active Learning in Higher Education*, 22(1), 37–48. <https://doi.org/10.1177/1469787418808988>
- Cents-Boonstra, M., Lichtwarck-Aschoff, A., Denessen, E., Aelterman, N., & Haerens, L. (2021). Fostering student engagement with motivating teaching: an observation study of teacher and student behaviours. *Research Papers in Education*, 36(6), 754–779. <https://doi.org/10.1080/02671522.2020.1767184>
- Choong Foong, C., Han Hong, W., Pallath, V., Adams, D., Kong Lee, Y., & Mun Tan, K. (2022). Now You See Me, Now You Don't: Exploring Medical Students' Cognitive, Emotional and Behavioural Engagement with Emergency Remote Learning During the COVID-19 Pandemic. *Medicine Journal*, 14(3), 109. <https://doi.org/10.21315/eimj2022.14.3.8>
- Deng, R., Benckendorff, P., & Gannaway, D. (2020). Learner engagement in MOOCs: Scale development and validation. *British Journal of Educational Technology*, 51(1), 245–262. <https://doi.org/10.1111/bjet.12810>
- Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. *Review of Educational Research*, 74(1), 59–109. <https://doi.org/10.3102/00346543074001059>
- Fredricks, J. A., Filsecker, M., & Lawson, M. A. (2016). Student engagement, context, and adjustment: Addressing definitional, measurement, and methodological issues. *Learning and Instruction*, 43, 1–4. <https://doi.org/10.1016/j.learninstruc.2016.02.002>

- Giang, T. T. T., Andre, J., & Lan, H. H. (2022). Student Engagement: Validating a Model to Unify In-Class and Out-of-Class Contexts. *SAGE Open*, 12(4).  
<https://doi.org/10.1177/21582440221140334>
- Gladstone, J. R., Wigfield, A., & Eccles, J. S. (2022). Situated Expectancy-Value Theory, Dimensions of Engagement, and Academic Outcomes. In: Reschly, A.L., Christenson, S.L. (eds) *Handbook of Research on Student Engagement*. Springer, Cham.  
[https://doi.org/10.1007/978-3-031-07853-8\\_3](https://doi.org/10.1007/978-3-031-07853-8_3)
- Grillo, T. L. H., & Damacena, C. (2015). Student engagement: The role of social influence and locus of control. *International Journal of Management in Education*, 9(4), 466–485. <https://doi.org/10.1504/IJMIE.2015.072098>
- Halverson, L. R., & Graham, C. R. (2019). Learner Engagement in Blended Learning Environments: A Conceptual Framework. *Online Learning*, 23(2), 145–178.  
<https://doi.org/10.24059/olj.v23i2.1481>
- Han, C., & Huang, J. H. (2022). Chinese College Students' Perceived Teacher Autonomy Support and Engagement: A Moderated Mediation Model. *International Journal of Learning, Teaching and Educational Research*, 21(7), 269–285.  
<https://doi.org/10.26803/ijlter.21.7.14>
- Hart, S. R., Stewart, K., & Jimerson, S. R. (2011). The Student Engagement in Schools Questionnaire (SESQ) and the Teacher Engagement Form-New (TERF-N): Examining the preliminary evidence. *Contemporary School Psychology*, 15, 67–79.
- Heilporn, G., Raynault, A., & Frenette, É. (2024). Student engagement in a higher education course: A multidimensional scale for different course modalities. *Social Sciences and Humanities Open*, 9. <https://doi.org/10.1016/j.ssaho.2023.100794>
- Huang, M., Kuang, F., & Ling, Y. (2022). EFL learners' engagement in different activities of blended learning environment. *Asian-Pacific Journal of Second and Foreign Language Education*, 7(1). <https://doi.org/10.1186/s40862-022-00136-7>
- Iter, N. I., & Salhab, R. (2024). Exploring the Factors Influencing the College Students' Engagement in Mobile Learning in Palestine. *International Journal of Interactive Mobile Technologies*, 18(1), 75–96. <https://doi.org/10.3991/ijim.v18i01.43667>
- Karim, M. I., Shah, H., & Hamid, A. (2016). FACTOR STRUCTURE OF THE STUDENT ENGAGEMENT INSTRUMENT AMONG MALAYSIAN UNDERGRADUATES. *Jurnal Psikologi Malaysia*, 30(2).
- Kim, S., Cho, S., Kim, J. Y., & Kim, D. J. (2023). Statistical Assessment on Student Engagement in Asynchronous Online Learning Using the k-Means Clustering Algorithm. *Sustainability (Switzerland)*, 15(3). <https://doi.org/10.3390/su15032049>
- Lee, J., Song, H. D., & Hong, A. J. (2019). Exploring factors, and indicators for measuring students' sustainable engagement in e-learning. *Sustainability (Switzerland)*, 11(4).  
<https://doi.org/10.3390/su11040985>

- Li, J., & Xue, E. (2023). Dynamic Interaction between Student Learning Behaviour and Learning Environment: Meta-Analysis of Student Engagement and Its Influencing Factors. *Behavioral Sciences*, 13(1). <https://doi.org/10.3390/bs13010059>
- Linnenbrink-Garcia, L., Rogat, T. K., & Koskey, K. L. K. (2011). Affect and engagement during small group instruction. *Contemporary Educational Psychology*, 36(1), 13–24. <https://doi.org/10.1016/j.cedpsych.2010.09.001>
- Liu, M., Noordin, N., Ismail, L., & Abdrahim, N. A. (2023). Relationship between Student Engagement and Academic Achievement in College English Education for Non-English Majors in China. *International Journal of Learning, Teaching and Educational Research*, 22(8), 203–232. <https://doi.org/10.26803/IJLTER.22.8.12>
- Luan, L., Hong, J. C., Cao, M., Dong, Y., & Hou, X. (2020). Exploring the role of online EFL learners' perceived social support in their learning engagement: a structural equation model. *Interactive Learning Environments*, 31(3), 1703–1714. <https://doi.org/10.1080/10494820.2020.1855211>
- Marcionetti, J., & Zammitti, A. (2023). Italian Higher Education Student Engagement Scale (I-HESES): initial validation and psychometric evidences. *Counselling Psychology Quarterly*, 37(3), 470–494. <https://doi.org/10.1080/09515070.2023.2241031>
- Marôco, J., Assunção, H., Harju-Luukkainen, H., Lin, S. W., Sit, P. S., Cheung, K. C., Maloa, B., Ilic, I. S., Smith, T. J., & Campos, J. A. D. B. (2020). Predictors of academic efficacy and dropout intention in university students: Can engagement suppress burnout?. *PloS one*, 15(10), e0239816. <https://doi.org/10.1371/journal.pone.0239816>
- Maroco, J., Maroco, A. L., Bonini Campos, J. A. D., & Fredricks, J. A. (2016). University student's engagement: Development of the University Student Engagement Inventory (USEI). *Psicologia: Reflexao e Critica*, 29, 21. <https://doi.org/10.1186/s41155-016-0042-8>
- Munir, J., Faiza, M., Jamal, B., Daud, S., & Iqbal, K. (2023). The Impact of Socio-economic Status on Academic Achievement. *Journal of Social Sciences Review*, 3(2), 695–705. <https://doi.org/10.54183/jssr.v3i2.308>
- Niittylahti, S., Annala, J., & Mäkinen, M. (2019). Student engagement at the beginning of vocational studies. *Nordic Journal of Vocational Education and Training*, 9(1), 21–42. <https://doi.org/10.3384/njvet.2242-458x.199121>
- Poort, I., Jansen, E., & Hofman, A. (2022). Does the group matter? Effects of trust, cultural diversity, and group formation on engagement in group work in higher education. *Higher Education Research and Development*, 41(2), 511–526. <https://doi.org/10.1080/07294360.2020.1839024>
- Ramírez Hernández, F., Durón-Ramos, M. F., García-Vázquez, F. I., Chacón-Andrade, E. R., & Lobos Rivera, M. E. (2024). Effects of classroom climate and eudaimonic well-being on student engagement in Mexico and El Salvador. *International Journal of Educational Research Open*, 7. <https://doi.org/10.1016/j.ijedro.2024.100349>

- Reeve, J., & Jang, H. (2022). Agentic Engagement. In: Reschly, A.L., Christenson, S.L. (Eds.) *Handbook of Research on Student Engagement*. Springer, Cham. [https://doi.org/10.1007/978-3-031-07853-8\\_5](https://doi.org/10.1007/978-3-031-07853-8_5)
- Reeve, J., & Shin, S. H. (2020). How teachers can support students' agentic engagement. *Theory into Practice*, 59(2), 150–161. <https://doi.org/10.1080/00405841.2019.1702451>
- Reeve, J., & Tseng, C. M. (2011). Agency as a fourth aspect of students' engagement during learning activities. *Contemporary Educational Psychology*, 36(4), 257–267. <https://doi.org/10.1016/j.cedpsych.2011.05.002>
- Reschly, A. L., & Christenson, S. L. (2022). Jingle-Jangle Revisited: History and Further Evolution of the Student Engagement Construct. In: Reschly, A.L., Christenson, S.L. (eds) *Handbook of Research on Student Engagement*. Springer, Cham. [https://doi.org/10.1007/978-3-031-07853-8\\_1](https://doi.org/10.1007/978-3-031-07853-8_1)
- Roy, S. K., Japutra, A., Singh, G., & Chakraborti, R. (2023). Decision comfort and student engagement in higher education. *Journal of Marketing for Higher Education*, 1-22. <https://doi.org/10.1080/08841241.2023.2186558>
- ŞEKER, M. (2023). Deconstructing learner engagement: An expanded construct model for higher education learners. *International Journal of Assessment Tools in Education*, 10(3), 395–412. <https://doi.org/10.21449/ijate.1215747>
- Sharma, H. (2022). How short or long should be a questionnaire for any research? Researchers dilemma in deciding the appropriate questionnaire length. *Saudi Journal of Anaesthesia*, 16(1), 65–68. [https://doi.org/10.4103/sja.sja\\_163\\_21](https://doi.org/10.4103/sja.sja_163_21)
- Shehzad, N., & Charles, T. (2023). Exploring the impact of instructor social presence on student engagement in online higher education. *Contemporary Educational Technology*, 15(4). <https://doi.org/10.30935/cedtech/13823>
- Teng, Y., & Wang, X. (2021). The effect of two educational technology tools on student engagement in Chinese EFL courses. *International Journal of Educational Technology in Higher Education*, 18(1). <https://doi.org/10.1186/s41239-021-00263-0>
- Veiga, F. H. (2016). Assessing Student Engagement in School: Development and Validation of a Four-dimensional Scale. *Procedia - Social and Behavioral Sciences*, 217, 813–819. <https://doi.org/10.1016/j.sbspro.2016.02.153>
- Wang, M. Te, Fredricks, J. A., Ye, F., Hofkens, T. L., & Linn, J. S. (2016). The Math and Science Engagement Scales: Scale development, Validation, And psychometric properties. *Learning and Instruction*, 43, 16–26. <https://doi.org/10.1016/j.learninstruc.2016.01.008>
- Yau, O. K. T., & Shu, T. M. (2023). Why are students with a higher level of grit more engaging in learning? The mediation effect of negotiable fate on the grit-student engagement relationship in higher education during COVID-19. *Journal of Pacific Rim Psychology*, 17. <https://doi.org/10.1177/18344909231171728>

- Yulia, M. F., Sulisty, G. H., & Cahyono, B. Y. (2020). Affective engagement in academic reading: What EFL student teachers reveal. *International Journal of Evaluation and Research in Education*, 9(3), 791–798. <https://doi.org/10.11591/ijere.v9i3.20635>
- Yuyun, I. (2023). Investigating university student engagement in online learning: A case study in EFL classroom. *Indonesian Journal of Applied Linguistics*, 12(3), 634–653. <https://doi.org/10.17509/ijal.v12i3.46035>
- Ze, Y. S. & Molinari, G. (2021). Engagement in MOOCs Discussion Forums: Dimensions and Indicators. *Proceedings of the 15th International Conference of the Learning Sciences - ICLS 2021*, 921-922.
- Zhoc, K. C. H., Webster, B. J., King, R. B., Li, J. C. H., & Chung, T. S. H. (2019). Higher Education Student Engagement Scale (HESES): Development and Psychometric Evidence. *Research in Higher Education*, 60(2), 219–244. <https://doi.org/10.1007/s11162-018-9510-6>

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