Bachelor thesis

Student engagement and satisfaction in active learning classrooms

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Bachelorwerkstuk Pedagogische Wetenschappen
Juni 2023

Abstract

Het doel van deze bachelor thesis was om meer kennis te verkrijgen over de relatie tussen studenten betrokkenheid en tevredenheid binnen zogenaamde ‘active learning classrooms’ (ALC). Dit zijn lokalen waarbinnen actief leren wordt bevorderd door sociale interactie en samenwerking. Deze thesis gebruikte secundaire data reeds verkregen uit een al lopend onderzoek binnen de Rijksuniversiteit Groningen, namelijk het TEO project. Studenten die les krijgen in ALC zijn gevraagd hun betrokkenheid te rapporteren op basis van een aantal stellingen om inzicht te krijgen in de effectiviteit van deze lokalen op de RUG. Deze vragenlijst is gebaseerd op die van Holec en Marynowski (2020) en veronderstelde dat betrokkenheid op te delen is in drie componenten, namelijk gedragsmatig, psychosociaal en cognitief. Doordat de vragen zowel in het Engels als Nederlands beschikbaar waren, is er in deze thesis een Mokkenschaalanalyse gedaan om de interne consistentie en betrouwbaarheid van de items per subschaal te toetsen. Hieruit kwamen verschillen tussen de subschalen naar voren, wat zou kunnen duiden op verschillen in interpretatie of betrokkenheid tussen beide taalgroepen. Bij de analyse van het TEO project dient hier rekening mee gehouden te worden. Verder bleek dat gerapporteerde betrokkenheid voornamelijk samenhangt met cognitieve betrokkenheid, dus wanneer studenten gefocust zijn en zichzelf uitdagen in de les. Daarnaast kwam naar voren dat betrokken zijn in de les positief samenhangt met tevreden zijn over de ALC en dat dit voornamelijk gebeurt wanneer studenten psychosociaal betrokken zijn. Dit suggereert dat emotioneel en sociaal participerende studenten de ALC als prettig ervaren.

Student engagement and satisfaction in active learning classrooms

"Experience is the foundation upon which knowledge is constructed", according to John Dewey (1938/1997). He believed that creating opportunities for students to have educational experiences based on social interaction and communication is fundamental to actively learning. George Bodner (1986) emphasized this by stating that knowledge should be constructed rather than effortlessly transferred in the minds of students, as they require understanding on their own. Therefore, the role of the instructor should be to facilitate learning rather than to impose knowledge directly to the students. This method of learning actively involves students in the collaborative construction of knowledge which has been shown to be effective in improving student academic performance (Beichner, 2000; Beichner, 2007; Blasco-Arcas et al., 2013; Deslauriers et al., 2019; Holec & Marynowski, 2020; Lasry et al., 2013; Li & Lerner, 2013).

Active learning classrooms (ALC) are designed to promote active forms of learning by encouraging students to engage in the learning process through collaboration and social interaction, as they offer the necessary conditions for constructive educational experiences (Holec & Marynowski, 2020). These classrooms are equipped with features such as movable furniture, flexible seating arrangements, and technology to promote group work and communication, as well as active participation (Cotner et al., 2013). When students have access to adequate resources, it can increase their self-efficacy and motivation to learn for the sake of understanding (Khan & Madden, 2016). Therefore, when placed in a suboptimal learning environment that is shown to significantly enhance self-rated engagement, students tend to exert greater effort (Holec & Marynowski, 2020). The article by Kregenow, Rogers, and Price (2011) emphasizes the significance of matching teaching style to classroom design and layout, as it influences student engagement and attention by considering the physical arrangement, particularly the teacher's placement. Additionally, the influential role of teachers in using active learning techniques has been shown to positively promote student engagement, which, in turn, is associated with enhanced learning outcomes in active, constructive and interactive activities (Almarghani & Mijatović, 2017; Wekerle et al., 2020). This means that matching the teaching method to the classroom can yield positive results for student outcomes. Understanding of this concept and knowing how to successfully implement it can create an equal opportunity for students to be engaged, which may potentially help in narrowing the achievement gap (Holec & Marynowski, 2020). However, the investigation of learning environments is a relatively new pursuit, and the concept of aligning teaching styles with classroom designs is still an emerging idea (Lasry et al., 2013).

Most studies investigating the effectiveness of active learning classrooms have shown promising results. Beichner's initial study in 2000 used the approach of active learning, which integrates classroom environment, teaching, and student outcomes, promoting a student-centered active learning environment with non-traditional teaching methods. He suggested that students in these active classrooms outperformed their peers in traditional classrooms 88% of the time. In addition, this study found that students in this type of environment demonstrated improvement in their attitudes toward learning. Similar results of improved grades and attitudes were found in Beichner's additional study, where the classroom was specifically matched to the learning pedagogy (Beichner, 2007). Despite this, the majority of instructors in college courses with large enrollments still rely on traditional teaching methods (Deslauriers et al., 2019).

Holec and Marynowski (2020) found comparable improvements in the perception of student engagement, which was not observed in the traditional classroom. However, the study of Deslauriers and colleagues (2019) found that the students showed lower perception of the learning experience than their peers in passive learning environments. The ratings from students were generally positive, but the instructors also reported negative attitudes. The students felt burdened by the added responsibility for their own learning, expressed dislike for being compelled to interact with their peers, and voiced concerns that "the blind cannot lead the blind". Initially, when students engage in active learning and experience heightened cognitive effort, they may interpret this effort as a sign of poor learning. This disconnect between effort and learning can negatively impact students' motivation, engagement, and ability to regulate their own learning. Based on the findings of Ballen et al. (2017), which highlight the importance of student engagement and motivation in the effectiveness of active learning, it becomes crucial for students to recognize the benefits of actively engaging with course content. By emphasizing student participation in the classroom, promoting active engagement can have a positive effect on fostering student commitment to excellence and appreciation of their peers' contributions, ultimately enhancing the overall learning experience (Curran & Rosen, 2006).

Taken together, these studies suggest that active learning classrooms have a positive impact on student engagement and learning outcomes. The term "student engagement" encompasses three components, which are behavioral, psychosocial, and cognitive. Behavioral engagement refers to the active participation of students in school-based activities (Li & Lerner, 2013). This can be observed through actions such as following rules, attending classes, and actively participating in learning by asking questions and collaborating with peers. Psychosocial engagement involves students' interests, values, emotions, sense of belonging, and attachment

to their learning environment, including interactions with faculty and peers. Cognitive engagement refers to motivation, effort, and strategy use, and may include students' problem-solving abilities, preference for challenging work, and ability to cope positively with failure (Holec & Marynowski, 2020). When a student is thoughtful of their education and is willing to invest in learning, they are believed to be cognitively engaged (Li & Lerner, 2013).

These three components of student engagement, as discussed by Holec and Marynowski (2020) and Li and Lerner (2013), are the main focus of the current study. It is part of a larger study, the TEO project, which investigates the effective elements of an active learning classroom at the University of Groningen. Specifically, the aim of this thesis is to explore the relationship between student engagement and satisfaction, as well as to examine which component of engagement is most associated with student engagement and satisfaction in active learning classrooms. Unraveling these relationships can lead to deeper understanding of the factors that contribute to being satisfied with learning in active learning classrooms and the overall effectiveness of active learning approaches. The following research question was formulated; (1) “To what extent is student satisfaction related to student engagement in the Active Learning Classroom (ALC)?”. Moreover, two subsequent questions were added to test the reliability of the two versions of the questionnaire and to further elaborate on the contribution of the three components of engagement; (2) “What are the psychometric properties of the questionnaire used in this study, and are there any variations observed between the English and Dutch versions?” and (3) “Among the three components of engagement (behavioral, psychosocial and cognitive), which component has the greatest impact on student engagement and satisfaction within the ALC?”

Method

Design

The aim of the study was to investigate the relationship between student satisfaction and (the three components of) student engagement. To achieve this, a quasi-experimental design was employed, using secondary quantitative data. This data was measured at one point in the second half of the course. The dependent variable and independent variables are displayed in table 1, an overview of all items used in this study are shown in table 2 (see Appendix A).

Table 1

Dependent and independent variables, operationalized with item numbers and measurements

Type of variable	Operationalization [a]	Item	Measure
Dependent variable			
Item 'Satisfaction'	"students' overall contentment, fulfillment, and positive experiences in the ALC"	Q9.1	Likert-5
Independent variables			
Item 'Overall Engagement'	"time on task, quality of effort, student involvement, and social and academic integration"	Q3.1	Likert-7
Behavioral engagement	"being active and participating by asking questions and collaboratively working with other students"	Q2.1;Q2.8	Likert-5
Psychosocial engagement	"student-faculty interaction and peer-to-peer interaction, student attitudes, interest and values"	Q7.1;Q7.7	Likert-7
Cognitive engagement	"students' flexibility in problem solving, preference for challenging work, and positive coping in the face of failure"	Q8.1;Q8.6	Likert-7

Note.
[a] *Operationalization of the variables based on the article of Holec and Marynowski (2020).*

Participants

The target population for the study consisted of students at the University of Groningen who's courses were being taught in active learning classrooms. The sample (n = 175) comprised 72 female and 89 male participants, with five identifying as non-binary, and four participants who chose not to reveal their gender. The inclusion criterion was as follows: age range 17 to 29 (M = 20.2, SD = 2.19), resulting in the exclusion of five participants as they did not meet this criterion. The courses the participants followed were; (new) Media Archives, Canada and the USA, Global Integration, Intercultural Communication, Introduction to Econometrics, Mechanics and Relativity, OOO (Orientatie op Onderwijs) and Sustainable contributions to Society.

Instrument

The questionnaire used in this study was derived from the one used in the study of Holec and Marynowski (2020), consisting of questions about the engagement and experiences of students in ALC. The first set of questions queried general data from the participants, such as age, gender, language and courses. The rest of the questions consisted of statements to which the participants had to self-rate their level of agreement using 5 or 7-point Likert scales. This part included questions on behavioral (eight items), psychosocial (seven items), and cognitive (six items) engagement (table 2). Participation was used to reflect the behavioral component, as well as collaboration, which was also used for the psychosocial component. Atmosphere was used to reflect both psychosocial and cognitive components and belonging as well for this last component. Q3.1 asked the participants to rate their engagement in their course (item 'Overall engagement'), and Q9.1 how they generally feel about the ALC (item 'Satisfaction').

Holec and Marynowski (2020) examined the psychometric properties of their questionnaire by analyzing its internal consistency and reliability. The first subscale (behavioral engagement) showed somewhat low internal consistency (n = 7, α = 0.59), which was primarily influenced by item Q2.3 (r = -0.11) and Q2.4 (r = 0.28). They argued that removing Q2.3 would be beneficial for the questionnaire as it would increase Cronbach's alpha to 0.66. On the other hand, high internal consistency was found for the psychosocial subscale (n = 7, α = 0.84), as well as for the cognitive subscale (n = 5, α = 0.80), indicating high reliability for both scales. Moreover, item 8.2, initially included as a performance measurement and not intended to be part of the cognitive subscale, was also excluded. Based on these statements, both Q2.3 and Q8.2 were excluded from the statistical analyses in this study.

Procedure

The current study is part of the larger TEO project at the University of Groningen and uses a dataset that was already available from this project. TEO (Temporary Experimental Classrooms) is a Quality Agreement project of four years in 2020-2024 and focuses on studying ALC. The data was gathered through an online Qualtrics questionnaire administered to students in ALC by their instructors at the University of Groningen. The instructors were approached towards the end of their course and were asked to participate. They were aware that they may be approached for research purposes. If they agreed, additional support was offered for data collection, either through the researchers themselves or with an additional researcher. However, only a few availed themselves of this support, while others conducted the data collection entirely on their own, and some had an additional researcher present.

Data collection took place at the conclusion of a teaching session, where students completed the questionnaire in the classroom. They were requested to provide ratings for both their level of engagement in the ALC and their overall attitude towards it. The questionnaire was available in both English and Dutch (see Appendix B) and the average duration of completion was 10 minutes. Informed consent was included within the questionnaire. Ethical approval for the entire research project was obtained from the Ethical Committee.

Analysis

The data are analyzed to determine the strength of the relationship between student engagement and satisfaction, and to identify which of the three components of engagement explains most of this relationship. Using MSP-5 software, a Mokken Scale Analysis was performed to analyze the psychometric properties of the questionnaire data (Molenaar, et al., 1994). This analysis aimed to assess the item homogeneity (H_i) and explore the scalability of the items using a nonparametric item response theory approach. The H_i coefficients reveal if the items are of equal difficulty. For this, the dataset has been specified to contain just the items regarding the three components of engagement, as well as items ‘Satisfaction’ and ‘Overall engagement’. It also included language considerations to identify potential differences between the translated questions. The findings of these psychometric properties will be presented in the results section.

Before the start of the analysis in SPSS, a few changes were carried out to prepare the data. First, items Q2.3 and Q8.2 were excluded from the data analysis based on the findings of Holec and Marynowski (2020). Next, all items per component of engagement were computed into three mean variables. Furthermore, since Likert-5 and Likert-7 scales were used, it was necessary to convert the mean scores into z-scores to be able to compare the data from these different scales.

The relationship between the students' engagement levels and satisfaction within the ALC was examined by analyzing the responses to item 'Satisfaction' in conjunction with the other items. This data analysis consisted of two sequential steps. First, a correlation analysis was conducted to measure the association between student engagement and satisfaction. The mean z-scores of each component of engagement were used to be correlated with the items ‘Satisfaction’ and ‘Overall Engagement’. Secondly, a regression analysis was executed to identify which of the three components of engagement explains most of the variance of both items. This analysis provides insight into the contribution of each component to the prediction of student satisfaction, as well as the influence on being engaged in an ALC.

Results

Mean scores

The item quality of the subscales was viewed by a Mokken Scale Analysis (specifically Mokken's Model of Monotone Homogeneity, abbreviated Mokken's MMH) using MSP-5 software (table 3). The analysis of behavioral engagement (total *n* = 170, Dutch *n* = 58 & English *n* = 112) showed that the highest mean (*M* = 4.03, *SD* = 1.08) was found for the item about working with other students during class. The lowest mean (*M* = 2.28, *SD* = 1.23) was exhibited by the item regarding discussions with the instructor outside of class. Psychosocial engagement (total *n* = 152, Dutch *n* = 51 & English *n* = 101) had a lot of missing data, resulting in a smaller sample size for the analysis. The highest mean was shown by the item where participants agreed that their instructor respects what they have to say (*M* = 7.20, *SD* = 1.02). The lowest mean (*M* = 5.97, *SD* = 1.70) was exhibited by the item displaying whether working outside of class with classmates is a good use of time. Cognitive engagement (total *n* = 170, Dutch *n* = 58 & English *n* = 112) showed the highest mean for the item about feeling responsible for how well students do in school (*M* = 6.91, *SD* = 1.27). Being focused on school activities during class as indicated by the first item of this subscale exhibited the lowest mean score (*M* = 5.58, *SD* = 1.58).

The students' standardized responses to the three engagement scales (comprising compound z-scores of the mean variables of behavioral, psychosocial, and cognitive engagement) were statistically compared. Behavioral engagement had a lower mean (*M* = 3.31, *SD* = .692) than psychosocial (*M* = 6.48, *SD* = 1.08) and cognitive engagement (*M* = 6.23, *SD* = .940), considering the different Likert scales. Cronbach's alpha for all items of the three subscales was .733, respectively. This indicates a relatively good reliability for this part of the questionnaire since it's above the threshold of .70.

Item homogeneity coefficients (H_i)

The Mokken's MMH of behavioral engagement showed low H_i coefficients for the total group, especially for Q2.3 and Q2.4 (H_i = 0.01) (table 3). These particular items lack sufficient discriminative power, making it unable to effectively differentiate between students with low and high scores. Consequently, that does not align with the intended scale, as it is considered of poor quality. On the other hand, item Q2.6 displayed the highest coefficient (H_i = 0.34), indicating that it fits well within the scale, as it captures the essence of behavioral engagement by involving the explanation of class concepts to fellow classmates. When assessing language

differences, the analysis showed higher H_i coefficients for the English items compared to the Dutch items.

Table 3

Summary of means and item homogeneity coefficients per component of engagement

Item	Total group		Dutch group		English group	
BE [a]	*n* = 170		*n* = 58		*n* = 112	
	Mean	**Hi**	**Mean**	**Hi**	**Mean**	**Hi**
Q2.1	3.67	0.27	3.81	0.09	3.60	0.36
Q2.2	3.39	0.26	3.60	0.11	3.43	0.33
Q2.3	2.79	0.01	3.07	0.01	2.64	0.00
Q2.4	4.03	0.13	3.97	0.01	4.06	0.21
Q2.5	3.15	0.25	3.40	0.15	3.02	0.30
Q2.6	3.31	0.34	3.09	0.27	3.43	0.40
Q2.7	2.28	0.27	2.41	0.18	2.21	0.32
Q2.8	3.27	0.26	3.14	0.20	3.34	0.30
PE [b]	*n* = 152		*n* = 51		*n* = 101	
	Mean	**Hi**	**Mean**	**Hi**	**Mean**	**Hi**
Q7.1	6.73	0.45	6.82	0.31	6.68	0.49
Q7.2	6.81	0.39	6.88	0.27	6.77	0.43
Q7.3	7.20	0.38	7.16	0.24	7.22	0.45
Q7.4	6.17	0.45	5.98	0.40	6.27	0.48
Q7.5	5.97	0.44	5.96	0.34	5.98	0.47
Q7.6	6.70	0.41	6.73	0.35	6.68	0.43
Q7.7	6.13	0.43	6.25	0.36	6.07	0.45
CE [c]	*n* = 170		*n* = 58		*n* = 112	
	Mean	**Hi**	**Mean**	**Hi**	**Mean**	**Hi**
Q8.1	5.58	0.36	5.78	0.42	5.48	0.33
Q8.2	6.02	0.30	5.98	0.33	6.04	0.29
Q8.3	6.66	0.32	6.48	0.36	6.75	0.31
Q8.4	6.35	0.20	6.36	0.20	6.35	0.20
Q8.5	5.64	0.32	5.78	0.37	5.56	0.31
Q8.6	6.91	0.23	7.00	0.20	6.87	0.24

Note. [a] BE = Behavioral Engagement. [b] PE = Psychosocial Engagement. [c] CE = Cognitive Engagement.

The analysis of psychosocial engagement showed relatively high Hi coefficients for the total group when compared to the other two subscales (table 3), especially for Q7.1 and Q2.4 (H_i = 0.45). Q7.3 exhibited the lowest coefficient (H_i = 0.38). Comparably, the English group showed similar values, with some items displaying even higher H_i coefficients compared to the total group. The varying and overall lower H_i values of the Dutch group suggest that these items are less capable of differentiating between students with high and low scores, suggesting this subscale is less effective in assessing students' psychosocial engagement compared to the English items.

Lastly, item Q8.4 of the subscale cognitive engagement had the lowest H_i coefficient (H_i = 0.20) for both languages and the total group, along with Q8.6 for the Dutch group (table 3). Similar to the behavioral subscale, these items showed low H_i coefficients for the total group. The items of the English and Dutch group differ in higher and lower values when comparing each item. However, in general, the English group exhibited the lowest H_i coefficients, suggesting that this subscale may be relatively less effective in assessing students' cognitive engagement when compared to the Dutch items.

Assumptions

Various checks were conducted to evaluate the assumptions of the correlation and multiple regression analyses. The dataset consisted of a representative sample and any outliers were removed prior to analysis. Scatterplots indicated a general linear relationship between the variables, and histograms confirmed that the data followed relatively normal distributions. Additionally, homoscedasticity showed a moderately equal spread of data points and residuals, while the VIF values supported the absence of multicollinearity. Overall, the confirmation of these assumptions strengthens the reliability and validity of the results.

Correlation

The findings of the correlation analysis are displayed in table 4. This analysis revealed that the item 'Overall Engagement' had a significantly and relatively strong correlation with the item 'Satisfaction' ($r = .431$, $p < .001$). Of all mean z-scores, psychosocial engagement exhibited the highest correlation with item 'Satisfaction' ($r = .520$, $p < .001$), which is a strong correlation. The correlations of behavioral ($r = .441$, $p < .001$) and psychosocial engagement ($r = .346$, $p < .001$) were on the weaker side. When using item 'Overall engagement', cognitive engagement displayed the highest correlation ($r = .556$, $p < .001$), next to the psychosocial ($r = .517$, $p <$

.001) and behavioral (r = .443, p < .001) components. All correlations were of statistical significance.

Table 4

Correlation coefficients and p values of the mean z scores per component of engagement with item 'Satisfaction' and item 'Overall engagement'

Variable	1	2	3	4	5
1. Behavioral engagement	—				
2. Psychosocial engagement	.582*	—			
3. Cognitive engagement	.340*	.485*	—		
4. Item 'Satisfaction'	.441*	.520*	.346*	—	
5. Item 'Overall engagement'	.443*	.517*	.556*	.431*	—

Note. *n* = 170. *p < .001.

Multiple regression

The findings of the regression analysis are displayed in table 5. This analysis examined which of the three components explained the items 'Overall engagement' and 'Satisfaction' the best. Regression analysis using the item 'Overall engagement' showed an Adjusted R-squared of .400 (F(3,166) = 38.6, p < .001), indicating that the three predictors, i.e. the three components of engagement, explained 40,0% of the variance. The Adjusted R-squared was chosen, because it can provide a more precise view of the correlation when many independent variables are added (Frost, 2019). Cognitive engagement exhibited a remarkably higher correlation than the other two (β = .386, t = 5.647, p < .001). However, psychosocial (β = .224, t = 2.837, p = .005) and behavioral engagement (β = .181, t = 2.464, p = .015) also significantly predicted overall engagement significantly.

The second regression analysis indicated that the three predictors explained 29,5% of the variance with an Adjusted R-squared of .295 (F(3,166) = 24.6, p < .001) for the item 'Satisfaction'. This is considered a low effect size, suggesting the influence of student engagement, i.e. the three components, on the dependent variable student satisfaction is weak. It was found that psychosocial engagement significantly predicted student satisfaction (β = .352, t = 4.103, p < .001), as did behavioral engagement (β = .200, t = 2.510, p = .013).

However, cognitive engagement showed a low (non-significant) value (β = .107, t = 1.443, p =.151). These findings align with the outcomes of the correlation analysis.

Table 5

Regression beta coefficients and p values per component of engagement with item 'Overall engagement' and item 'Satisfaction'

Item 'Overall engagement'	Beta	t	Sig. (2-tailed)
Behavioral engagement	.181	2.464	.015
Psychosocial engagement	.224	2.837	.005
Cognitive engagement	.386	5.647	.000*
Item 'Satisfaction'	Beta	t	Sig. (2-tailed)
Behavioral engagement	.200	2.501	.013
Psychosocial engagement	.352	4.103	.000*
Cognitive engagement	.107	1.443	.151

Note. Beta (B) is a standardized coefficient that indicates the strength and direction of the relationship between the predictor (independent variable) and outcome variable (dependent variable) (Van Heijst, 2023).
*p < .001.

Discussion

To conclude, the primary objective was to investigate the relationship between student engagement and satisfaction in active learning classrooms, specifically focussing on identifying the main contributor of the three components of engagement. Additionally, this study examined the psychometric properties to assess any language differences between the two versions of the questionnaire. To answer this, the following research questions were formulated; (1) "To what extent is student satisfaction related to student engagement in the Active Learning Classroom (ALC)?", (2) "What are the psychometric properties of the questionnaire used in this study, and are there any variations observed between the English and Dutch versions?", and (3) "Among the three components of engagement (behavioral, psychosocial and cognitive), which component has the greatest impact on student engagement and satisfaction within the ALC?". The findings from the MMH's Mokken Scale Analysis suggest that the Dutch questionnaire's translations are insufficient, resulting in a less precise representation of the subscales compared to the English version. Secondly, the correlation and regression analyses revealed that student satisfaction is positively related to student engagement. This finding is supported by the study of Muzammil and colleagues (2020), who investigated the impact of student interaction and

engagement on satisfaction in online learning. Furthermore, it was found that when students are psychosocially engaged in the ALC, they tend to have a positive attitude towards this type of classroom. This matches the findings of another study (Lane et al., 2021) who found that psychosocial engagement is a significant predictor of student satisfaction. Moreover, the study revealed that students perceive higher levels of engagement when they are actively engaged in cognitive activities within the active learning classroom. The rest of the findings also displayed significant values, meaning that all components of engagement are related to being engaged and feeling satisfied within the ALC.

Methodological limitations

The results of the Mokken's MMH revealed that the items measuring behavioral engagement mostly exhibited low H_i values, for the total group as well as both language groups. This indicates that this subscale has a limited ability to differentiate effectively between individuals with varying scores, resulting in lower measurement precision. Therefore, item Q2.3 was excluded from the subsequent analyses, because of its low and non-significant H_i value, which was similarly found by Holec and Marynowski (2020). Item Q2.4 exhibited similar low values and should therefore be held in consideration for exclusion in future research when using the same questionnaire.

Furthermore, the analysis showed a significant difference between the participants that chose the Dutch version and the English version of the questionnaire. Some items displayed H_i coefficients below the threshold of 0.3 for the entire group and both languages, meaning that some items are less correlated to their subscale and may not be measuring that construct adequately. These findings, along with the other observed differences between the two language groups, suggest that the Dutch and English students might have variations in their interpretation of the items, potentially leading to differences in subsequent results. They also may just differ in the degree of engagement, or the type of engagement. Another possible explanation for the observed differences between language groups, as seen in the emotional subscale where English speakers tended to score higher and displayed stronger effects compared to the Dutch group, may be because international students are often more motivated and emotionally invested in their studies (Chue & Nie, 2016). This may be attributed to the significant financial investment and intentional decision to study abroad, emphasizing the importance they place on their education. Therefore, the results of the correlation and regression analysis with SPSS have to be interpreted carefully. Moreover, these findings should be taken into consideration with the results of the TEO project, as it accentuates the importance

of carefully interpreting the questionnaire outcomes. Future research should consider the consequences of translating and adapting instruments. Gudmundsson (2009) provides guidelines that can improve the standardization of this questionnaire and enhance the comparability and reliability of data, ultimately advancing our understanding of the relationship between engagement and satisfaction in active learning environments.

Lastly, it is worth mentioning that the reduced variability of the item 'Satisfaction' facilitates more accurate predictions of student satisfaction, as these values demonstrate greater consistency compared to item 'Overall Engagement'. Subjective self-perception of engagement can be influenced by factors beyond cognitive engagement, potentially leading to variations in individuals' accuracy in perceiving their own engagement. This could be explored in a more comprehensive follow-up study to differentiate between the perception of being engaged compared to actually being engaged.

Recommendations

Based on the findings of this study, it is recommended that universities invest in Active Learning Classrooms (ALCs) and promote active learning approaches across all courses. Prioritizing the stimulation of students' psychosocial and cognitive engagement is crucial as it can lead to increased student engagement and enjoyment of this learning approach. This aligns with the findings of Muzammil et al. (2020), who discovered that interaction among students, interaction between students and content, and interaction between students and teachers positively impact student engagement and satisfaction. To ensure deep satisfaction in learning, students should go beyond mere participation and actively engage psychologically with the learning process through making connections, applying knowledge, and investing mental energy and attention (Louis & Schreiner, n.d.).

In a related study, Cruickshank et al. (2012) explored the implementation of group work to enhance interaction among students from diverse backgrounds, aiming to foster a sense of community and cultural understanding. They emphasized the importance of creating a supportive learning environment that facilitates effective communication and student interaction. The results demonstrated improvements in student engagement and learning outcomes. These findings collectively underscore the value of promoting active learning, cultivating positive teacher-student relationships, and creating inclusive learning environments to enhance student satisfaction and academic success.

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Appendix A

Table 2

Items of the questionnaire per component of engagement

Item	Question
	Behavioral engagement (BE)
Q2.1	“When I wanted to, I contributed to a class discussion that occurred during class.”
Q2.2	“When I wanted to, I asked questions during class.”
Q2.3	“I came to class without having completed readings or assignments.”
Q2.4	“I worked with other students on projects during class.”
Q2.5	"When I wanted to, I worked with classmates outside of class to prepare assignments/projects.”
Q2.6	"I explained concepts or ideas from class to classmates.”
Q2.7	“When I wanted to, I discussed ideas from readings or class with the instructor outside of class.”
Q2.8	“When i wanted to, I discussed ideas from class with others outside of class (students, family, friends, coworkers, etc.).”
Q3.1	“Overall, how would you describe your engagement in this course this term?”
	Emotional engagement (EE)
Q7.1	"I am comfortable talking to my classmates.”
Q7.2	“My classmates respect what I have to say.”
Q7.3	“The instructor respects what I have to say.”
Q7.4	“Working with classmates on activities during class was a good use of my time.”
Q7.5	“Working with classmates on activities outside of class was a good use of my time.”
Q7.6	"I am comfortable talking to the instructor during class.”
Q7.7	"I am comfortable talking to the instructor outside ofclass.”
	Cognitive engagement (CE)
Q8.1	“When I am in class, my mind is focussed on class activities.”
Q8.2	“I expect to do well in this course.”
Q8.3	“Understanding the subject of this course is important to me.”
Q8.4	“I prefer courses that challenge me intellectually.”
Q8.5	“I put a lot of effort into this course.”
Q8.6	“I am responsible for how well I do in this course.”
Q.9.1	“Generally, how do you feel about this classroom as a learning environment?”

Appendix B

Questionnaires in English and Dutch

Vragenlijst studentbetrokkenheid

Uit: Holec, Victoria, and Richelle Marynowski. 2020. “Does It Matter Where You Teach? Insights from a Quasi-Experimental Study of Student Engagement in an Active Learning Classroom.” *Teaching & Learning Inquiry* 8, no. 2. http://dx.doi.org/10.20343/teachlearninqu.8.2.10.

Engels (original)

[1. Four questions pertaining to age, gender, year of study, and whether the course was required for the student’s degree.]

2. Please rate the frequency with which you have engaged in the following behaviors in this course this term.

[1] Never
[2] Rarely
[3] Sometimes
[4] Often
[5] Very often

1. When I wanted to, I contributed to a class discussion that occurred during class.
2. When I wanted to, I asked questions during class.
3. I came to class without having completed readings or assignments.
4. I worked with other students on projects during class.
5. When I wanted to, I worked with classmates outside of course to prepare assignments/projects.
6. I explained concepts or ideas from class to class mates.
7. When I wanted to, I discussed ideas from readings or class with the instructor outside of class.
8. When I wanted to, I discussed ideas from class with others outside class (students, family, friends, co-workers, etc.)

3. Overall, how would you describe your engagement in this course this term?
[1] Not at all engaged
[8] Very engaged

4. Please rate your level of agreement with the following items:
[1] Strongly disagree
[8] Strongly agree

The instructor…

1. Encourages me to participate in class.
2. Encourages me to collaborate with my classmates.
3. Helps to create a positive atmosphere in class.
4. Gives me a sense of belonging in this class.

5. Please rate your level of agreement with the following items:
[1] Strongly disagree
[8] Strongly agree

My classmates…

1. Encourage me to collaborate with them.
2. Give me a sense of belonging in this class.
3. Encourage me to participate in class.
4. Help to create a positive atmosphere in class.

6. Please rate your level of agreement with the following items:
[1] Strongly disagree
[8] Strongly agree

This classroom…

1. Helps to create a positive atmosphere in class.
2. Encourages me to participate in class.
3. Gives me a sense of belonging in this class.
4. Encourages me to collaborate with my classmates.

7. Please rate your level of agreement with the following items:
[1] Strongly disagree
[8] Strongly agree
[x] N/A / I did not do this

1. I am comfortable talking to my classmates.
2. My classmates respect what I have to say.
3. The instructor respects what I have to say.
4. Working with classmates *during* class was a good use of my time.
5. Working with classmates *outside* of class was a good use of my time.
6. I am comfortable talking to the instructor *during* class.
7. I am comfortable talking to the instructor *outside* of class.

8. Please rate your level of agreement with the following items:
[1] Strongly disagree
[8] Strongly agree

1. When I'm in class, my mind is focused on class activities.
2. I expect to do well in this course.
3. Understanding the subject of this course is important to me.
4. I prefer courses that challenge me intellectually.
5. I put a lot of effort in this course.
6. I am responsible for how well I do in this course.

9. Other information
Please rate your level of agreement with the following items:
[1] I hate it
[5] I love it

1. Generally, how do you feel about this classroom as a learning environment?

Nederlands

1. Basisgegevens

1. Wat is je naam?
2. Wat is je emailadres?
3. Welke cursus heb je gevolgd in een ALC? noteer de naam en cursuscode.
4. Met welk gender identificeert u zich?
5. Wat is uw leeftijd?
6. Was de cursus verplicht voor het behalen van een diploma?

2. Betrokkenheid
Geef aan hoe vaak u de onderstaande gedragingen heeft vertoond tijdens het vak in dit blok.

[1] Nooit
[2] Zelden
[3] Soms
[4] Vaak
[5] Bijna altijd

1. Wanneer ik dat wilde, droeg ik bij aan discussies die plaatsvonden tijdens de colleges
2. Wanneer ik dat wilde, stelde ik vragen tijdens de colleges.
3. Ik kwam naar de les zonder de voorgeschreven literatuur helemaal gelezen te hebben of de opdrachten te hebben gemaakt.
4. Ik werkte met andere studenten aan projecten tijdens de les.
5. Wanneer ik dat wilde, werkte ik met andere studenten buiten de les samen om opdrachten of projecten voor te bereiden.
6. Ik heb concepten of ideeën uit de les uitgelegd aan andere studenten.
7. Wanneer ik dat wilde, heb ik ideeën of literatuur uit de les met de docent besproken buiten de les.
8. Wanneer ik dat wilde heb ik ideeën uit de les besproken met anderen buiten de les, zoals studenten, familie, vrienden, collega's etc.

3. Hoe zou jij jouw betrokkenheid bij deze cursus willen omschrijven?
[1] Helemaal niet betrokken
[8] Heel erg betrokken

4. De docent
Geef aan in welke mate je het eens bent met onderstaande stellingen.

[1] Geheel mee oneens
[8] Geheel mee eens

De docent…
1. Stimuleert mij om mee te doen in de klas.
2. Stimuleert mij om samen te werken met mijn klasgenoten.
3. Helpt om een positieve sfeer in de klas te creëren.
4. Geeft mij het gevoel dat ik thuishoor in deze klas.

5. Klasgenoten
Geef aan in welke mate je het eens bent met onderstaande stellingen.

[1] Geheel mee oneens
[8] Geheel mee eens

Mijn klasgenoten…
1. Stimuleren mij om met hen samen te werken.
2. Geven mij het gevoel dat ik thuishoor in deze klas.
3. Helpen mij om mee te doen in de klas.
4. Helpen om een positieve sfeer in de klas te creëren.

6. Het klaslokaal
Geef aan in welke mate je het eens bent met onderstaande stellingen.

[1] Geheel mee oneens
[8] Geheel mee eens

Dit klaslokaal…
1. Helpt om een positieve sfeer in de klas te creëren.
2. Stimuleert mij om mee te doen in de les.
3. Geeft mij het gevoel dat ik thuishoor in deze les.
4. Stimuleert mij om samen te werken met mijn klasgenoten.

7. Geef aan in hoeverre je het eens bent met de volgende uitspraken:
[1] Geheel mee oneens
[8] Geheel mee eens
[x] Niet van toepassing / Dit heb ik niet gedaan

1. Ik voel mij comfortabel om met mijn klasgenoten te praten.
2. Mijn klasgenoten respecteren wat ik te zeggen heb.
3. De docent respecteert wat ik te zeggen heb.
4. Samenwerken met klasgenoten aan activiteiten *tijdens* de klas was een goede besteding van mijn tijd.
5. Samenwerken met klasgenoten aan activiteiten *buiten* de klas was een goede besteding van mijn tijd.
6. Ik voel me comfortabel om tegen de docent te praten *tijdens* de klas.
7. Ik voel me comfortabel om tegen de docent te praten *buiten* de klas.

8. Geef aan in hoeverre je het eens bent met de volgende uitspraken:
[1] Geheel mee oneens
[8] Geheel mee eens

1. Tijdens de les is mijn aandacht gefocust op les gerelateerde activiteiten.
2. Ik verwacht het goed te doen in dit vak.
3. Het begrijpen van het onderwerp van dit vak is belangrijk voor me.
4. Ik heb een voorkeur voor cursussen die mij intellectueel uitdagen.
5. Ik steek veel moeite in dit vak.
6. Ik ben zelf verantwoordelijk voor hoe goed ik het doe in dit vak.

9. Overig
[1] Ik heb er een hekel aan
[5] Ik hou er van

1. Wat vind je, in het algemeen, van dit lokaal als leeromgeving?