Associations Between Learning Environment and Study Satisfaction Across Time: Two Cross-Sectional Analyses of Occupational Therapy Students

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Abstract

There is increasing attention toward students' satisfaction and how they perceive the quality of the program they attend. This study examined stability and change across time with regard to the relationships between learning environment factors and occupational therapy students' satisfaction with the program. In the two consecutive cross-sectional analyses performed in this study, 163 second-year students and 193 third-year students from all six occupational therapy education programs in Norway participated. The Course Experience Questionnaire was used to assess learning environment factors and study satisfaction. The data were analyzed with Pearson's correlation coefficient r and with hierarchical linear regression. Bivariate associations between the learning environment scales were positive and most associations were statistically significant in both study years. Relatively stable associations between the learning environment variable "good teaching" and higher study satisfaction were detected, while other associations differed between years of study. Embedding quality into the learning process, in particular by emphasizing good teaching and the clear dissemination of goals and standards, is important for student satisfaction throughout years of study.

Comments

The authors declare that they have no competing financial, professional, or personal interest that might have influenced the performance or presentation of the work described in this manuscript.

Keywords

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By educating knowledgeable, engaged, and conscious citizens, higher education institutions play a decisive social role in society. The key to success is high-quality education that activates and engages students as equal members of the academic community, building on an understanding that knowledge is not a product to be passed on and consumed but rather something that forms and develops during inspiring and challenging learning activities (Ministry of Education and Research, 2017).

During the last decades, there has been increasing attention toward students' satisfaction and how they perceive the quality of the program they attend. Educational institutions and government agencies perform systematic evaluations at the start, during, and toward the end of the programs. Results from national surveys on student satisfaction are publicly disseminated and may create competition between programs and educational institutions. However, Calma and Dickson-Deane (2020) argued that focusing on student satisfaction by using product-based quality indicators with the business aim to give the student ("customer") what he or she wants is in disagreement with the principal aims of quality in higher education. One such principal aim is for the student to become an active participant in the learning process. Mark (2013), on the other hand, emphasized that the customer role is no longer seen as a passive demander and that the "customer student" can both participate and collaborate. To ensure student retention and progression, higher education institutions are required to continuously develop strategies that meet the students' expectations (Mark, 2013). By emphasizing the students' evaluations, the students' involvement in and collaboration on curriculum development will help increase the quality of education.

A shift from lecture-based courses to student-centered learning activities characterizes modern higher education (Lumpkin et al., 2015). As educators in occupational therapy undergraduate programs, we have reflected on student satisfaction and the role it may have in the planning and delivery of teaching in these programs. For example, using student-active learning activities requires substantial student engagement, with the teacher role shifting from traditional lecturing to a more facilitating role (Biggs et al., 2022). In retrospect, we have experienced that students tend to evaluate courses positively based on student-active teaching methodologies. Nevertheless, in these courses, students are required to take responsibility for their own learning and may, therefore, describe these learning activities as frustrating, unsettling, and highly demanding (Dall'Alba & Bengtsen, 2019). Even though the students often say they have learned a lot, some students state that they are not satisfied because they have to do the work themselves. In fact, researchers have reported that students choose courses without significant challenges to obtain a degree as easily as possible (Garnjost & Lawter, 2019; Nixon et al., 2018). This aligns with what Illeris (2016) described as the psychological misunderstanding about learning; teachers, faculty, management, and students may be satisfied when the expected lecture has been delivered, repeating core aspects of the syllabus. The emphasis on delivering the lecture implies a focus on the teacher's activity rather than on the students' learning. Consequently, there is a risk of resources being spent on activities that have little effect on learning or that, in some cases, work directly against its intentions (Illeris, 2016). According to Garnjost and Lawter (2019), consumerism has also culminated in faculties promoting courses with entertaining lectures. Educational institutions have put more pressure on faculties to develop courses that are engaging, entertaining, and with attention paid to marketable skills (Garnjost & Lawter, 2019).

Several researchers have questioned the pragmatic and non-binding use of the "quality in education" concept. Karlsen (2017) criticized how the Norwegian Agency for Quality Assurance in Education (NOKUT) refers to the concept of education quality with a somewhat random and varying meaning content in the analyses of the annual national student survey. Some researchers have also

questioned the lack of a clear understanding of the relationship between educational quality and student satisfaction (Grace et al., 2012). Overall satisfaction with a program has been found to be an emotive variable that includes a range of different aspects, such as students' perceptions of teaching, standard settings, assessment, and workload, but also their perceptions of other services in the educational setting, such as administrative quality, parking or access to public transport, timetabling, facilities, and technologies (Duque, 2014; Grace et al., 2012). Thus, student satisfaction can be viewed as influenced by several more or less distinct aspects of the learning environment. Moreover, such environmental influences on student satisfaction may vary between universities, study programs, and other contexts and may also vary across time. Thygesen and coworkers (2020), in a study of first-year occupational therapy students, found that higher scores on the learning environment scales "good teaching," "emphasis on independence," and "clear goals and standards" were related to higher overall education program satisfaction. However, as that study only included one measurement, the degree to which these associations are stable over time is unknown. Repeating the analysis in subsequent years of study may improve the understanding of how learning environment factors are related to overall student satisfaction and whether relationships detected in an early stage of the education program change or persist over time.

Study Aim

This study aimed to examine stability and change across time with regard to the relationships between learning environment factors and student satisfaction while adjusting for individual background variables. The research questions were:

1. What are the intrinsic relationships between the five learning environment scales in different years of study?
2. What are the associations between each of the learning environment scales and student satisfaction in different years of study?

Method

Design and Study Context

The study is part of a 3-year investigation of one cohort of Norwegian occupational therapy students. Students from all six occupational therapy education programs in Norway were included. The class sizes differed between 24 and 77 students. The bachelor's degree study program has a duration of 3 years, and all six study programs are full-time. The research project has previously investigated the students' perceptions of the learning environment (Bonsaksen et al., 2019; Stigen et al., 2022; Thordardottir et al., 2020; Thygesen et al., 2020), the students' approaches to studying (Bonsaksen et al., 2019; Stigen et al., 2022; Thordardottir et al., 2020; Thygesen et al., 2020), associations between the perceived learning environment and study approaches (Bonsaksen et al., 2019; Stigen et al., 2022; Thordardottir et al., 2020; Thygesen et al., 2020), as well as associations between the perceived learning environment, approaches to studying, and the students' academic performance (Bonsaksen et al., 2019; Bonsaksen et al., 2021; Mygland et al., 2023; Stigen et al., 2022; Thordardottir et al., 2020; Thygesen et al., 2020).

Participants, Recruitment, and Response Rate

Occupational therapy students admitted to one of the involved education institutions in 2017 were approached in their respective classrooms with an invitation to participate in this study. The questionnaires were identical in all three study years and completed with paper and pencil during a classroom session. For this study, data were collected while the students were in the second and third years of study. The second-year data gathering was performed from December 2018 to February 2019, and the third-year data

gathering was from December 2019 to February 2020. In the second year, 168 students participated (55.1% response rate), while 200 students participated in the third year (response rate 65.6%). This resulted in 305 participating students. After removing the participants with missing values on one or more variables, the sample sizes were 163 students in the second year and 193 students in the third year.

Measurement

Sociodemographic Background and Education-Related Variables

Information regarding sociodemographic background (age and gender) and education (prior higher education and time spent self-studying during a typical week) was collected as part of the questionnaire. The relevant data are presented in Table 1.

The Learning Environment

The original *Course Experience Questionnaire* (Ramsden, 1991) was devised to assess the quality of the education programs as perceived by students. The instrument has 30 items distributed onto five scales. The scales are, with example items in parenthesis: clear goals and standards (e.g., "It's always easy here to know the standard of the work expected"), emphasis on independence (e.g., "There are few opportunities to choose the particular areas you want to study"), good teaching (e.g., "The teaching staff of this course motivate students to do their best work"), appropriate workload (e.g., "The workload is too heavy"), and appropriate assessment (e.g., "To do well on this course all you really need is a good memory"). A "long version" of the CEQ (36 items) has also been established (Lizzio et al., 2002; Wilson et al., 1997), including a sixth scale concerned with generic skills (e.g., "This course has helped me develop the ability to plan my own work"). In addition, one item was added to the original scale (Richardson, 2009), assessing the students' general satisfaction with the course ("Overall, I am satisfied with the quality of this course"). The Norwegian translation of the long version has previously been validated (Pettersen, 2007), and this was used in the present study.

Scores on each item reflect that the participants *agree* (5), *agree somewhat* (4), *are not sure* (3), *disagree somewhat* (2) and *disagree* (1). Higher scale scores indicate that the education program is perceived to have (a) clearly established and disseminated goals; (b) high levels of student autonomy and independence; (c) teaching that engages and involves the students; (d) a workload that is not too high; and (e) assessment forms that promote and support learning. The program is also perceived to (f) support the transfer of content knowledge and skills to the relevant work context. The internal consistency (Cronbach's α) of each of the scales were in the first study year 0.73 (clear goals and standards), 0.63 (emphasis on independence), 0.70 (good teaching), 0.69 (appropriate workload), 0.45 (appropriate assessment), and 0.83 (generic skills). Owing to its low internal consistency, the appropriate assessment scale was not used in the analyses (Bonsaksen et al., 2019).

Data Analysis

All data were entered into the computer program IBM SPSS Statistics (Version 26). Separate analyses were performed for each study year. Descriptive analyses were performed on all variables using means (*M*), standard deviations (*SD*), frequencies, and percentages. Bivariate associations between the learning environment scales and between learning environment scales and education program satisfaction were assessed with Pearson's correlation coefficient *r*. Hierarchical linear regression analyses were conducted to assess direct relationships between the learning environment scales and study satisfaction while adjusting for sociodemographic variables, study effort, and prior experience from higher education. Effect sizes from the analysis were reported as standardized beta coefficients (β). Building on Cohen (1992), effect sizes were interpreted as small (β about 0.10), medium (β about 0.30), and large (β about

0.50). The regression models also assessed the regression models' explanatory power. Statistical significance was set at $p < 0.05$.

Ethics

Approval for collecting and storing the data was granted by the Norwegian Center for Research Data. The students were informed that completion of the questionnaires was voluntary, their responses would be treated in confidence, and there would be no negative consequences for opting not to participate in the study. Written informed consent was provided from all of the participants. The students were also informed that it was possible to withdraw their consent at any time without providing a reason.

Results

Participants

At enrollment, the mean age of the participants in the sample was 23 years, and about four out of five were women. The participants' background characteristics, scores on the learning environment scales, and scores on education program satisfaction are displayed in Table 1.

Table 1

Background Characteristics and Learning Environment Scale Scores in the Second-Year and Third-Year Student Samples

Characteristics	Scale range	2nd year (*n* = 163)	3rd year (*n* = 193)
Background variables			
Age at enrollment (M [SD])		22.5 (4.5)	22.7 (4.5)
Female gender (n [%])		131 (80.4)	149 (77.2)
Prior higher education (n [%])		63 (38.7)	78 (40.4)
Time spent on self-study (M [SD])		9.1 (6.8)	8.4 (6.7)
Learning environment scales			
Clear goals and standards (M [SD])	5–25	17.0 (3.2)	17.0 (3.6)
Emphasis on independence (M [SD])	6–30	18.1 (3.8)	18.0 (4.6)
Good teaching (M [SD])	8–40	25.2 (5.3)	26.0 (6.1)
Appropriate workload (M [SD])	5–25	15.4 (3.7)	15.2 (3.9)
Generic skills (M [SD])	6–30	23.7 (3.2)	24.6 (4.6)
Education program satisfaction (M [SD])	1–5	3.8 (0.9)	3.7 (0.9)

Note. All learning environment items are scored 1–5. Thus, the scale range is a result of the number of items on the scale. Age is age when enrolled in the program.

Bivariate Associations Between the Learning Environment Scales

The bivariate associations between the learning environment scales (including the study satisfaction item) are shown in Table 2. Among students in the second study year, the intrinsic associations between the learning environment scales were positive (*r* ranging between 0.11 and 0.57) and most associations, but not all, were statistically significant. The scales' bivariate associations with education program satisfaction ranged between 0.10 (*ns*) for the association with "appropriate workload" and 0.56 ($p < 0.001$) for the association with "good teaching."

Among students in the third study year, all intrinsic associations between the learning environment scales were also positive (*r* ranging between 0.10 and 0.48) and most, but not all associations, were statistically significant. The scales' bivariate associations with education program satisfaction ranged between 0.20 ($p < 0.01$) for the association with "appropriate workload" and 0.43 ($p < 0.001$) for the association with "good teaching."

Table 2

Bivariate Intrinsic Associations Between the Learning Environment Scales and Between the Scales and Study Satisfaction Among the Students While in the Second- (n = 163) and Third- (n = 193) Year of Study

Learning environment scales	1.	2.	3.	4.	5.	6.
1. Clear goals and standards	1	0.26***	0.48***	0.32***	0.35***	0.41***
2. Emphasis on independence	**0.37*****	1	0.38***	0.10	0.28***	0.24**
3. Good teaching	**0.57*****	**0.42*****	1	0.13	0.41***	0.43***
4. Appropriate workload	**0.23****	**0.14**	**0.16***	1	0.23**	0.20**
5. Generic skills	**0.41*****	**0.33*****	**0.44*****	**0.11**	1	0.38***
6. Study satisfaction	**0.37*****	**0.37*****	**0.56*****	**0.10**	**0.34*****	1

Note. Learning environment scales are derived from the Course Experience Questionnaire. Table content is Pearson's correlation coefficient *r*. Associations in **bold** are derived from the responses of second-year students, associations in not bold are derived from the responses of third-year students. *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

Adjusted Associations Between Learning Environment Scales and Study Satisfaction

The results from the linear regression analyses are displayed in Table 3. Among the second-year students, while controlling for all variables in the final model, higher education program satisfaction was significantly associated with higher scores on "emphasis on independence" ($\beta = 0.15$, $p < 0.05$) and higher scores on "good teaching" ($\beta = 0.46$, $p < 0.001$). The final model accounted for 35.6% of the outcome variance, of which the scores on the learning environment scales contributed 35.4%.

Among the third-year students, higher education program satisfaction was significantly associated with higher scores on "clear goals and standards" ($\beta = 0.21$, $p < 0.01$), "good teaching" ($\beta = 0.22$, $p < 0.01$), and "generic skills" ($\beta = 0.19$, $p < 0.01$). The final model accounted for 27.7% of the outcome variance, of which the scores on the learning environment scales contributed 27.2%.

Table 3

Direct Associations Between Individual Background Variables, Perceptions of the Learning Environment, and Education Program Satisfaction in the Two Study Years

Characteristics	Education program satisfaction	
	2nd year	3rd year
Background variables	Std. β	Std. β
Age	0.07	0.04
Gender (male is reference)	0.01	0.02
Prior higher education (none is reference)	-0.02	0.01
Time spent on self-study	0.08	0.03
Explained variance	**0.2 %**	**0.5%**
Learning environment		
Clear goals and standards	0.04	0.21**
Emphasis on independence	0.15*	0.05
Good teaching	0.46***	0.22**
Appropriate workload	0.00	0.06
Generic skills	0.08	0.19**
R² change	**35.4 %*****	**27.2%*****
Explained variance	**35.6 %*****	**27.7%*****

Note. Table content is standardized beta coefficients, denoting the strength of each variable's association with education program satisfaction while adjusting for all other variables in the model. *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

Discussion

Intrinsic Associations Between Learning Environment Variables

In both the second and third study year, the bivariate associations between the learning environment scales were positive, and most associations were statistically significant. These associations are in line with the findings reported by Thygesen and co-workers (2020). Together, all the subscales cover aspects of the learning environment, which provides a theoretical rationale that supports the existence of positive relationships between the scales (Byrne & Flood, 2003; Pettersen, 2007; Wilson et al., 1997).

In both study years, "good teaching" demonstrated strong associations with most of the other learning variable scales. The largest effect sizes were found between "good teaching" and "clear goals and standards," and these associations were stronger in the second and third study years compared with the first (Thygesen et al., 2020). One possible explanation for the strong associations between these variables can be that the students value supportive teachers and their ability to explain and clarify the courses' goals and standards. Having a clear sense of the goals and standards of a course may make it easier to follow and focus on the essentials of the teaching content. Hence, the teachers' ability to convey clearly what they expect of their students may be viewed as an aspect of good teaching. Moreover, the results showed that the students who scored higher on teaching quality also perceived more strongly that the program facilitated the development of generic skills and emphasized student independence. These associations were also found in the first study year (Thygesen et al., 2020), which allows a speculation as to whether satisfaction with teaching quality may serve as a catalyst. When satisfied with the teaching, satisfaction may easily carry over to other elements of the learning environment.

On the other hand, the "appropriate workload" scale demonstrated the weakest correlations with the other learning environment variables and with overall satisfaction. This is consistent with findings from the first year of study (Thygesen et al., 2020) and the early validation study of the CEQ (Wilson et al., 1997). Because of these recurring results, it has been debated whether the "appropriate workload" scale should be viewed as a separate dimension distinct from the other learning environment factors (Richardson, 2009). While student evaluations are routinely used as a background for adjusting the curriculum, it would be problematic if educators were to alter pedagogically sound courses, including the workload on students, based on student evaluations that might over or underestimate the significance of the workload (Grace et al., 2012).

Associations Between Learning Environment Variables and Study Satisfaction

In the second and third study years, higher scores on "good teaching" were significantly associated with higher overall satisfaction, and the first study year demonstrated the same result (Thygesen et al., 2020). Students who have a positive learning experience through good teaching are likely to consider their skills and knowledge base as enhanced by the teaching and, therefore, likely to rate overall study satisfaction as higher (Grace et al., 2012). Other researchers have detected this association. Wilkins and Balakrishnan (2013) identified the quality of lectures as a key determinant of student satisfaction, and Thien and Jamil (2020) showed similar findings for female students in a recent study. In line with Illeris' (2016) claim that students may be inclined to misunderstand what learning is and what it entails, some researchers have discussed that it may not be the type of learning activity that is the students' utmost concern but rather the teachers' capacity for meeting their expectations in a "satisfying the customer" way (Calma & Dickson-Deane, 2020; Garnjost & Lawter, 2019). Since it has been argued that students are more satisfied with entertaining teachers (Borch et al., 2020; Nixon et al., 2018), it is conceivable that the entertainment factor is probably one of several factors the students consider when assessing teaching quality. However, as we do not have access to data regarding perceptions of the entertainment qualities of the assessed teaching, these are only preliminary thoughts. What seems evident, though, is that perceptions of good teaching, regardless of the specific factors that made it good, are strongly related to occupational therapy students' study satisfaction throughout the whole education program.

Higher scores on "clear goals and standards" were associated with higher study satisfaction both in the first (Thygesen et al., 2020) and third years of study. This is in line with other studies, implying that students who perceive the goals as clear and the standards as relevant are generally more satisfied with

the program (Kaur et al., 2022; Thien & Jamil, 2020; Yin et al., 2016). However, this association was not found in the second study year. As overall satisfaction has been found to be an emotive variable that includes students' perceptions of other services in the educational setting, such as administrative quality, timetabling, parking or access to public transport, teaching facilities, and technologies (Duque, 2014; Grace et al., 2012), there may be many underlying reasons for why associations vary from year to year. Overall, the students in this study had more clinical practice in the second year of study, especially compared to the first year (Thordardottir et al., 2020). Goals and standards are operationalized in learning outcomes in all courses, including clinical practice. Nevertheless, as the students changed their physical learning environment from classrooms to clinical practice settings, received supervision from an occupational therapist, and performed client services, it may have led to decreased emphasis on theory and the stated learning outcomes. Perceptions of actual learning and mastery in real-life situations are likely important for study satisfaction and may far outweigh the importance of how learning outcomes are stated in the curriculum.

Higher scores on "generic skills" were significantly associated with higher overall satisfaction, but only in the third year of study. This association is in line with other similar studies (Grace et al., 2012; Kaur et al., 2022; Yin et al., 2016). Of particular interest is that this correlation became significant only in the last study year. It takes time to become aware of the importance of skills, such as critical thinking, problem-solving, and communication, which may partially explain these differences between the study years. The skills are relevant to the field of work the students are entering. Knowing that they have improved these skills by their participation in the program may have increased their study satisfaction toward the end of their studies.

Higher scores on "emphasis on independence" were significantly associated with higher study satisfaction in the second year of study. This is consistent with the results reported by Yin and colleagues (2016). However, the effect size found in the second study year was smaller compared with the effect size detected in the first year of study (Thygesen et al., 2020). As no significant association was found in the third study year, students' perceived independence may become gradually less important for their study satisfaction throughout their studies. One reason can be a potential response shift among students, who may view independence in the program differently when having become more accustomed to it (Stigen et al., 2022). They may expect more of themselves and others, and independence may not be of the same importance for their overall study satisfaction.

Study Strengths and Limitations

Our use of only one group of health care students is a limitation. Nevertheless, it strengthens the study that all six occupational therapy programs in Norway were included, even though the response rate varied between the institutions. Measuring the learning environment factors using a validated questionnaire strengthens this study. However, the study sample was too small for formally validating the CEQ.

Participants who complete longitudinal studies may be somewhat more well-organized and academically oriented than those who drop-out (DaLomba et al., 2021). Thus, the students who participated in the surveys, in particular those who participated in every one of them, may have had a more positive attitude toward the learning environment and may have been more satisfied compared to those who did not participate.

Overall study satisfaction was measured with a 1-item scale. Although this question is frequently used in research, there is a lack of information about its validity. For example, the extent to which

responses to the question would be related to responses to other scales designed to assess study satisfaction is unknown. Moreover, there is uncertainty regarding what students have in mind and how they might weigh different aspects against each other when they respond. To address this issue, researchers may conduct qualitative interviews with students as a follow-up after a questionnaire-based data collection. This will, to a greater extent, provide knowledge about what students refer to when they are asked about their overall satisfaction with the study program. It will also be applicable to investigate students' study satisfaction over a longer period even after having completed the study program, since students need time to reflect fully on their experiences with the study program and how one's learning can be applied in a work situation (Lomas, 2007).

Conclusion and Implications

In both study years, the learning environment scales related positively to each other, yet with varying effect sizes, and not all associations reached statistical significance. While higher scores on "good teaching" were significantly associated with higher satisfaction in both study years, although with decreasing effect size over time, other associations differed more strongly between the study years. Based on our findings, fostering generic skills and making the students aware of them is increasingly important for their study satisfaction toward the end of the study program. Student independence, however, appears to be more important for study satisfaction in the early stages of the program. Overall, embedding quality into the learning process, in particular by emphasizing good teaching and the clear dissemination of goals and standards, appears particularly relevant for ensuring student satisfaction.

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