

# Age, gender and approaches to studying predict academic performance among Norwegian occupational therapy students

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## AGE, GENDER AND APPROACHES TO STUDYING PREDICT ACADEMIC PERFORMANCE AMONG NORWEGIAN OCCUPATIONAL THERAPY STUDENTS

### Abstract

**Background:** Students' academic outcomes may be a result of several factors including the students' personal characteristics, their study behaviors, and characteristics of the learning environment. This study examined the associations between age, gender, approaches to studying, and academic performance in Norwegian occupational therapy students.

**Methods:** Occupational therapy students (n = 160) completed the Approaches and Study Skills Inventory for Students (ASSIST). Age, gender, and ASSIST subscale scores were used in a hierarchical linear regression analysis to predict the students' average academic performance.

**Results:** Higher age and female gender were associated with higher academic performance among the students. In addition, three ASSIST subscales were associated with higher performance: higher scores on *achieving* and *lack of purpose*, and lower scores on *fear of failure*. The full model accounted for 27.3 percent of the outcome variance.

**Conclusions:** To improve academic performance among occupational therapy students, it appears important to increase their motivation for achievement, and to reduce their fear of failure.

**Keywords:** academic performance, higher education, occupational therapy, students

## INTRODUCTION

Students' learning outcomes and subsequent academic performance may be associated with a range of factors. Knowledge about the factors of importance for students' success in higher education is important because it may enable teachers to identify the students who most likely will perform well without much help, and those who are likely to be in need of more support. Where study behaviors are related to academic performance, students may be provided with specific advice regarding how they can change their way of studying in order to obtain better results.

According to Biggs' (1987) «3P» model of learning, the factors of relevance for students' learning in higher education can be organized in three sections: the presage, process, and product factors. Presage refers to the student's general background and predispositions for studying, in essence, his or her readiness for intellectual inquiry. Presage is also comprised by the context within which learning takes place, including the classroom environment and the teaching and assessment forms frequently used. Process, on the other hand, refers to the student's behaviors when relating to the study content and materials. Following Marten and Säljö (1976) and the later contributions by Entwistle and colleagues (Entwistle, 2007; Entwistle & McCune, 2004; Entwistle & Ramsden, 1983; Entwistle, Tait, & McCune, 2000; Tait & Entwistle, 1996; Tait, Entwistle, & McCune, 1998), the analytic categories of deep, surface, and strategic learning have been frequently used to denote the learning process.

Deep learning takes place

when the student, motivated by a drive towards comprehensive understanding, tries to connect concepts and ideas in order to understand the meanings of the study materials. Surface learning, on the other hand, takes place when the student, motivated by a drive towards avoiding failure, tries to remember factual content and makes sure that the pre-planned syllabus has been read. This approach often results in rote learning (Baxter, Mattick, & Kuyken, 2013). Strategic learning may include aspects from both deep and surface learning approaches, and the motivation is oriented towards achievement. The strategic student wants the best possible grades, and organizes his or her study efforts accordingly (Entwistle & Ramsden, 1983).

The product of learning is generally considered to be related to both presage and process – the learning outcome is seen as a result of the interplay between the student's characteristics, his or her learning environment, and the way the student engages with the study content (Entwistle, 2007). Occupational therapists face a variety of challenges in practice, and thus the learning outcomes of occupational therapy students should mirror this variation (Moyers, 2014). In addition to demonstrating the skills relevant for hands-on clinical practice, occupational therapy students also need to be able to apply relevant concepts and theories to a variety of clinical situations. Without conceptual frameworks to guide their application, clinical skills may not be applied in the most appropriate manner (Cole & Tufano, 2008; McColl, Law, & Stewart, 2015). Thus, learning outcomes for oc-

cupational therapy students need to include the academic aspect, in addition to clinical skills.

Considering presage factors across various disciplines, research on higher education students have generally found that older students perform better than younger students (Bonsaksen, Brown, Lim, & Fong, 2017; Zeegers, 2001). This may be a result of more intrinsic motivation, more higher education experience, and more frequent use of productive study approaches among the older students (Beccaria, Kek, Huijser, Rose, & Kimmins, 2014; Bonsaksen, Brown, et al., 2017; Shanahan, 2004; Zeegers, 2001). Similarly, female students have been reported to perform better academically than male students (Richardson, Abraham, & Bond, 2012), but these findings appear to be more ambiguous and the effects of gender may be discipline specific (Ballantine, Duff, & Larres, 2008; Graunke & Woosley, 2005; Salamonson et al., 2013; Severiens & Dam, 1998; Zeegers, 2001).

Considering process factors, the deep and strategic study approaches have generally been associated with better learning outcomes when compared with the surface approach (Diseth & Martinsen, 2003; Kusrkar, Ten Cate, Vos, Westers, & Croiset, 2013; Mattick, Dennis, & Bligh, 2004; Richardson et al., 2012; Salamonson et al., 2013). A recent cross-cultural study with 712 students from Australia, Norway, Hong Kong, and Singapore found that five subscales of the employed study approach measure were associated with the students' average exam grade (Bonsaksen, Brown, et al., 2017). Specifically, higher scores on the subscales *seeking meaning*, *achieving*, and

*lack of purpose*, and lower scores on *time management* and *fear of failure* were directly associated with the higher self-rated academic performance. However, another study from the same cross-cultural project showed considerable differences between the countries with regard to the students' scores on the study approach measure, the differences concerning eight of the 13 subscales and two of the three main scales (Brown et al., 2016). Thus, the results shown for the cross-cultural sample as a whole may have limited applicability to students in each of the specific countries. Because of this, country-specific analyses of the associations between approaches to studying and academic performance are warranted.

### STUDY AIM

The aim of the current study was to examine whether age, gender, and approaches to studying were associated with the Norwegian occupational therapy students' academic performance, as measured with their average exam grades. In addition, the outcome variance proportions explained by the demographic variables and the subscales belonging to each of the deep, strategic and surface approaches to studying were assessed.

## Methods

### DESIGN AND SETTING OF THE STUDY

This cross-sectional design study was conducted in the context of a cross-cultural study, including students from four different countries as participants (Brown et al., 2016). In this sub-study, data from the Norwegian students only were used.

### PARTICIPANTS AND RECRUITMENT

The inclusion criteria for the study were: 1) students enrolled in the relevant occupational therapy education program; and 2) students provided informed consent to participate in the study. A non-teaching member of staff distributed the questionnaires to students during breaks in classrooms. The data were collected in 2015.

One hundred and sixty students completed the questionnaire. The participants included all three year levels (first year  $n = 57$ , second year  $n = 50$ , and third year  $n = 53$ ).

The mean age of the students was 23.9 years (SD = 4.5 years), and female students were in majority ( $n = 126$ , 78.8 percent). The mean exam grade in the sample was 4.1 (SD = 0.9), indicating a 'good' grade level among the participants.

### MEASUREMENT

The outcome variable in the study was the students' academic performance, operationalized as their average exam grade at the time of the data collection. Academic performance scores were based on the qualitative descriptors related to the students' exam grade (The Norwegian Association of Higher Education Institutions, 2011): fail = 1, sufficient = 2, satisfactory = 3, good = 4, very good = 5, and excellent = 6.

Data related to the students' approaches to studying was obtained from the Approaches and Study Skills Inventory for Students (ASSIST; Tait et al., 1998). In this study, we used the 52-item questionnaire in section B (the Approaches to Studying questionnaire), and the students completed the Norwegian version

of the instrument (Diseth, 2001). Factor analysis has confirmed that the ASSIST items can be meaningfully organized as three main factors: the deep, strategic, and surface approaches (Byrne, Flood, & Willis, 2004; Entwistle et al., 2000; Reid, Duvall, & Evans, 2005). Each of the main factors consists of several subscales. The deep approach consists of the subscales *seeking meaning*, *relating ideas*, *use of evidence*, and *interest in ideas*. The strategic approach consists of *organized study*, *time management*, *alertness to assessment demands*, *achieving*, and *monitoring effectiveness*. Finally, the surface approach consists of *lack of purpose*, *unrelated memorizing*, *syllabus-bound*, and *fear of failure*.

The English version of the ASSIST scales has been shown to possess good internal consistency (Cronbach's  $\alpha$  ranging 0.61-0.88) when used with students in different academic and professional areas (Ballantine et al., 2008; Brodersen, 2007; Brown, Wakeling, Naiker, & White, 2014; Byrne et al., 2004; Reid et al., 2005). With the Norwegian version of the ASSIST (Diseth, 2001), the same three latent factors have been found, and satisfactory measures of internal consistency (Cronbach's  $\alpha$  ranging 0.70-0.82) have been established for each of them (Bonsaksen, Småstuen, et al., 2017; Diseth, 2001). In addition to the ASSIST, information regarding demographics (age and gender) were collected using a brief questionnaire.

### DATA ANALYSIS

All data were entered into the computer program IBM SPSS version 23 (IBM Corporation, 2015). Descriptive analyses were performed on all variables using means

(M), standard deviations (SD), frequencies and percentages as appropriate. Bivariate associations between the outcome and the independent variables were investigated using Pearson's correlation coefficient  $r$ . Hierarchical linear regression analysis was used to assess the amount of variance in the participants' academic performance that was explained by age, gender, and the ASSIST subscale scores. The analysis also assessed the independent associations between each of the independent variables and the participants' academic performance. In the first block of the regression model, the demographic variables were included: (1) age and gender (male = 0, female = 1). In the second block, the deep approach subscales were included: (2) *seeking meaning, relating ideas, use of evidence, and interest in ideas*. The third block added the strategic approach subscales: (3) *organized study, time management, alertness to assessment demands, achieving, and monitoring effectiveness*. The fourth block added the surface approach subscales: (4) *lack of purpose, unrelated memorizing, syllabus-bound, and fear of failure*. The level of statistical significance was set at  $p < 0.05$ .

## ETHICS

Approval for conducting the study was obtained from the Norwegian Data Protection Official for Research (project number 40314). The students were informed that completion of the questionnaires was voluntary, that their responses would be kept confidential, and that there would be no negative consequences from opting not to participate in the study.

ASSIST main scales	ASSIST subscales	Mean scores (SD)
<i>Deep approach</i>	Seeking meaning	14.71 (2.40)
	Relating ideas	14.03 (2.81)
	Use of evidence	14.26 (2.61)
	Interest in ideas	14.54 (2.91)
		71.13 (10.00)
<i>Strategic approach</i>	Organized study	13.03 (2.90)
	Time management	12.83 (3.04)
	Alertness to assessment demands	15.04 (2.71)
	Achieving	14.34 (2.68)
	Monitoring effectiveness	15.97 (2.33)
<i>Surface approach</i>		48.02 (8.74)
	Lack of purpose	8.85 (3.07)
	Unrelated memorizing	11.67 (2.85)
	Syllabus-bound	13.53 (2.91)
	Fear of failure	14.34 (3.67)

Table 1. The participants' approaches to studying ( $n = 160$ ).

Note. ASSIST: Approaches and Study Skills Inventory for Students.

## Results

### ASSIST SCORES

The mean deep approach score was 57.55 ( $SD = 8.33$ ), the mean strategic approach score was 71.13 ( $SD = 10.00$ ), and the mean surface approach score was 48.02 ( $SD = 8.74$ ). The mean ASSIST main scale scores and subscale scores are displayed in Table 1.

### FACTORS ASSOCIATED WITH ACADEMIC PERFORMANCE

The bivariate correlation analysis showed that higher age, higher scores on the *organized study* and *achieving* subscales, and lower scores on the *unrelated memorizing* and *fear of failure* subscales were associated with higher average exam grades among the students.

The subsequent multivariate linear regression analysis controlled for all variables simultaneously. Being of higher age and

being female were both directly associated with higher average exam grade. None of the deep approach subscales was associated with higher average exam grade. Among the strategic approach subscales, higher scores on *achieving* were directly associated with better average grade. Among the surface approach subscales, higher scores on *lack of purpose* and lower scores on *fear of failure* were directly associated with higher average exam grade. The strongest association was shown for *achieving* (std.  $\beta = 0.40$ ). The full regression model explained 27.3 percent of the total variance in average exam grades among the students, and 22.3 percent of the outcome variance was explained by the ASSIST subscales. Among the three main approaches, the strategic approach subscales explained the largest part of the outcome variance (10.0

percent), whereas the surface and deep approach subscales explained 8.2 percent and 4.1 percent, respectively. The results from the correlation and regression analyses are displayed in Table 2.

## Discussion

The aim of the current study was to examine associations between age, gender, approaches to studying, and academic performance among Norwegian occupational therapy students. The results showed that higher age, female gender, and three of the ASSIST subscales (higher scores on *achieving* and *lack of purpose*, and lower scores on *fear of failure*) were independently associated with better exam grades.

### DEMOGRAPHIC FACTORS ASSOCIATED WITH ACADEMIC PERFORMANCE

In line with previous research (Duckworth & Seligman, 2006; Richardson et al., 2012; Zeegers, 2001), being older and being female were associated with better average exam grades in the sample. However, the ASSIST subscale scores were held constant by the analyses in the current study. Thus, the effects of being older and being female are not just illustrating the tendency to employ productive approaches to studying among the older and female students. Being older and being female appears to be of importance for the students' academic performance in ways that extend beyond the older and female students' perhaps more productive approaches to studying. In comparison to the results of the cross-cultural study (Bonsaksen, Brown, et al., 2017), the associations between higher age, female gender and better

exam grades were also stronger in the Norwegian sample.

### ASSOCIATIONS WITH ACADEMIC PERFORMANCE AMONG THE ASSIST SUBSCALES

The *achieving* subscale, one of the strategic approach subscales, showed the strongest association with the students' academic performance. The strategic approach has been emphasized in prior research as a productive way of relating to study tasks (Diseth & Martinsen, 2003; Richardson et al., 2012), and the current study found that the ASSIST *achieving* subscale may be of particular importance. In fact, the effect size (std.  $\beta = 0.40$ ) was considerably larger than in the cross-cultural study (std.  $\beta = 0.22$ ; Bonsaksen, Brown, et al., 2017). The achievement-oriented student is strongly motivated towards getting good grades. Thus, the association between higher scores on the *achieving* subscale and higher average exam grade is a logical one. Similarly, it is logical that the strategic subscales taken together accounted for a larger part of the outcome variance, compared to the deep and surface scales.

Related to the surface approach, higher scores on the *fear of failure* subscale was associated with poorer average exam grades, and this is also consistent with previous education research (Richardson et al., 2012; Salamonson et al., 2013; Zeegers, 2001). The students who are afraid of failure may feel overwhelmed, worried about their own performance, and anxious if they think they do not keep up with the progression of their peers in the course. Such an anxiety-laden approach to studying may not translate into good academic results, which is refle-

cted in the results of this study. The attention directed towards their possible failure means less focus available for productive studying. The effect size related to *fear of failure* (std.  $\beta = -0.23$ ) was slightly larger than the one seen in the cross-cultural study (std.  $\beta = -0.17$ ; Bonsaksen, Brown, et al., 2017).

We also found that higher scores on *lack of purpose* (surface approach subscale) were associated with better average exam grades. This result is in conflict with study approach theory (Tait et al., 1998), and in direct contrast to previous research findings linking a surface approach to studying to poorer academic performance (Diseth, 2001; Diseth & Martinsen, 2003; Richardson et al., 2012). However, the association is similar – and with a larger effect size (std.  $\beta = 0.20$ ) – in comparison to the results of the cross-cultural study (std.  $\beta = 0.14$ ; Bonsaksen, Brown, et al., 2017). When considering the items comprising the *lack of purpose scale* (items expressing that the study may not be worthwhile, interesting, or relevant), it may be that some of the academically very capable students consider the occupational therapy course to be too easy, in that the intellectual challenge it presents them with does not live up to their perceived capacity. If this were the case, the intellectually very strong students may have rated the *lack of purpose subscale* at a high level while still achieving a high average exam grade.

Summarizing the similarities and differences between the cross-cultural study and the present study, using data from the Norwegian students only, a few issues deserve noting. In

the cases of statistically significant associations in the present study, the associations showed larger effect sizes. This serves to illustrate that large and heterogeneous samples often produce smaller effect sizes than smaller and more homogeneous samples. The associations detected in this study largely mirror the ones detected in the cross-cultural study, with two exceptions. The positive association with *seeking meaning* and the negative association with *time management*, as found in the cross-cultural study (Bonsaksen, Brown, et al., 2017), were not reproduced with the current sample. One reason for this may concern decreased statistical power in the present study, which can be assumed from examining the association of *time management* with academic performance – in fact, this association was stronger in the present study, compared to the cross-cultural study, but did not reach statistical significance.

The association between *seeking meaning* and academic performance was weaker than in the cross-cultural study, and it is therefore not surprising that it did not reach statistical significance. In fact, in the present study none of the deep approach subscales showed significant associations with academic performance. In view of the theoretical framework (Tait et al., 1998) and empirical studies (e.g., Bonsaksen, Brown, et al., 2017; Diseth & Martinsen, 2003; Kusrkar et al., 2013; Mattick et al., 2004; Richardson et al., 2012; Salamonson et al., 2013), this is rather surprising. It may indicate that students in the Norwegian occupational therapy course who prefer the deep learning approach are not well rewarded for their efforts to combine, contrast,

Independent variables	Academic performance	
<i>Demographics</i>	<i>r</i>	Std. $\beta$
Age	0.17*	0.19*
Gender	0.09	0.18*
<b>Explained variance</b>		<b>5.0 %*</b>
<i>Deep approach subscales</i>		
Seeking meaning	0.12	0.09
Relating ideas	-0.02	-0.14
Use of evidence	0.08	-0.02
Interest in ideas	0.00	-0.13
<b>R<sup>2</sup> change</b>		<b>4.1 %</b>
<b>Explained variance</b>		<b>9.1 %</b>
<i>Strategic approach subscales</i>		
Organized study	0.19*	-0.02
Time management	0.14	-0.18
Alertness to assessment	0.09	-0.00
Achieving	0.33**	0.40**
Monitoring effectiveness	0.20*	0.12
<b>R<sup>2</sup> change</b>		<b>10.0 %*</b>
<b>Explained variance</b>		<b>19.1 %**</b>
<i>Surface approach subscales</i>		
Lack of purpose	-0.07	0.20*
Unrelated memorizing	-0.25**	-0.14
Syllabus-bound	-0.14	0.02
Fear of failure	-0.23**	-0.23*
<b>R<sup>2</sup> change</b>		<b>8.2 %*</b>
<b>Explained variance</b>		<b>27.3 %**</b>

Table 2. Predictors of academic performance among the participants (n=160)  
 Note. Table content is Pearson's correlation coefficient *r*, indicating the strength of the bivariate associations, and standardized  $\beta$  weights, indicating the strength of each variable's relationship with average exam grade while controlling for all variables in the model. Coding: male = 0, female = 1. For all other variables higher scores indicate higher levels.  
 \*  $p < 0.05$ , \*\*  $p < 0.01$ .

and understand the ideas and meanings in the curriculum.

### STUDY LIMITATIONS

The study has several limitations. The cross-sectional study design precludes from inferring causal relationships between the study variables, i.e., it may be that academic results play a part in determining the students' way of

studying, and not just the opposite, as suggested from this study. Reciprocal relationships also seem possible. Convenience sampling and self-report questionnaires were used, both of which can lead to biased results. The participants in the study were recruited from one university only, and this may decrease the generalizability of the results. The study also

does not take into account other factors that may be associated with the adopted study approaches, such as students' perception of workload in their academic course, the types of assessments conducted, and the teaching approaches employed in the education program (Diseth, Pallesen, Hovland, & Larsen, 2006; Trigwell, Prosser, & Waterhouse, 1999).

## FUTURE RESEARCH

A similar study could be completed using a larger number of students groups from a larger number of universities. In the potential case of using international comparisons, undergraduate occupational therapy students' approaches to studying could be compared to those of graduate-entry masters or entry-to-practice clinical doctorate occupational therapy students. Occupational therapy students' approaches to studying may also be compared to those of other health professional student groups. Outcome variables in future studies may include objective measures of academic performance (actual exam grades), and may even go beyond the use of exam grades as outcome. Competent and effective occupational therapists need not just good grades, a perspective that preferably should be reflected in future research on this group of students.

## CONCLUSION

This study found that higher age and female gender were associated with better academic performance in a sample of Norwegian occupational therapy students. Three of the ASSIST subscales – higher *achieving*, higher *lack of purpose*, and lower *fear of failure* – were also associated with better exam grades. Based on the results,

educators should stimulate students to strive for positive achievement and try to prevent them from focusing on potential failure when engaged with learning. The message to students who want to perform well is that they should orient themselves toward achievement – to study in order to be able to perform well – rather than to try to avoid failure. Those who have a lower sense of purpose with their studying may also benefit from seeking and finding a meaningful purpose with it. However, with a view to their academic achievements, it appears that these students may perform well anyway.

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## Varmehjelpemidler

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