Associations between study approaches and exam grades among occupational therapy students in the United States

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Abstract

Purpose – Previous studies on the associations between approaches to studying and outcomes have been conducted largely in Europe, where participants have been largely undergraduate-level students. The purpose of this study is to examine the associations between study approaches and academic outcomes of graduate occupational therapy students in the USA.

Design/methodology/approach – In this study, 120 masters- and doctoral-level occupational therapy students in their first and second study year in a large metropolitan city completed the short version of the Approaches and Study Skills Inventory for Students (ASSIST). A total of 18 items from the full 52-items version comprise the short version of the ASSIST, with 6 items belonging to each of the deep, strategic and surface scales. Associations between the study approach scales and exam grades were analyzed with single and multiple logistic regression analyses.

Findings – There was a direct association between the use of strategic studying and higher grade point average. Thus, students who want to perform well academically are encouraged to use study behaviors comprised by the strategic approach to studying.

Originality/value – This study appears to be the first to examine associations between study approaches and academic performance among occupational therapy students in the US context. More research on the study approaches of US American students is warranted.

Introduction

Student study approaches have been categorized into three types: deep, in which students attempt to learn material in greater depth, strategic, in which students study with an aim toward getting the better grade, and surface, in which students study solely for the particular test or assignment (Entwistle, 2000). Using the *Approaches and Study Skills Inventory for Students* (ASSIST) (Tait *et al.*, 1998), earlier studies into the study approaches of occupational therapy students have been largely conducted in Australia and Europe, and only of undergraduate occupational therapy students. General findings have indicated that deep and strategic approaches to learning have been associated with good grades (Diseth and Martinsen, 2003; Kusurkar *et al.*, 2013; Salamonson *et al.*, 2003). However, recent findings have not always supported the idea of the use of deep approaches to achieve good grades; avoiding the use of the surface approach has been shown to be even more important. For example, Brown and Murdolo (2017)

investigated undergraduate occupational therapy students in Australia and found that deep and strategic approaches to studying had a very limited impact on academic performance among four year cohorts; however, fear of failure, an aspect of the surface approach, did have an impact. Other studies have observed undergraduate occupational therapy students in Denmark (Richardson *et al.*, 2005) and Australia, Singapore, Hong Kong and Norway (Bonsaksen *et al.*, 2019). Richardson *et al.* (2005) sought to identify a relationship between the "perceptions of academic quality and approaches to studying" in five occupational therapy schools in Denmark (p. 111). The researchers found no "material" consequences between student perceptions of the quality of an occupational therapy program and students' approaches to studying (p. 117). At the

same time, the authors noted that the schools surveyed may need to review their academic practices and procedures with regards to "explicitness" of goals and standards, teaching performance, and academic workload (p. 117). Bonsaksen and coworkers (2019) assessed the construct validity of the ASSIST. This study confirmed that the ASSIST measures students' deep, strategic and surface approaches to studying and that the main scales of the ASSIST may be used cross-culturally.

In the USA, masters- and entry-level occupational therapy programs must be accredited through the American Council of Occupational Therapy Education (ACOTE), which sets minimal standards for all occupational therapy programs (ACOTE, 2018). The 2018 Standards, which went into effect July 1, 2020, reflect a significant range of knowledge and ability for an occupational therapy student to be deemed a competent entry-level practitioner upon graduation. In applying the 2018 ACOTE Standards to an occupational therapy curriculum, one question many occupational therapy programs in the USA may ask is not only how to provide students with a well-rounded curriculum that meets these standards but also what skill set will students need to be successful in a rigorous program of study. Currently, there have been no studies using the ASSIST scale in graduate level occupational therapy students to determine student approaches to studying. Moreover, studies are needed to support or challenge the notion that study approaches are related to academic performance in graduate level occupational therapy education in the US context. Recently, the ASSIST has been investigated in graduate level occupational therapy students in the USA and found to have satisfactory psychometric properties to assess study approaches (Bonsaksen and Breen-Franklin, 2019).

Knowledge regarding graduate occupational therapy students' study approaches may be helpful for various reasons. Through a better understanding of students' study approaches, occupational therapy programs may be able to review curricular design, content development and quality of the educational program. Many occupational therapy programs require a minimum grade point average (GPA) for students to remain in the graduate course of study. Graduate occupational therapy students are aware that they must achieve this threshold to remain in the program and knowledge about which study approaches are more productive may help them achieve the grades they need. In addition, these studies may help identify how students learn and what strategies may assist them in modifying or changing their study behaviors (Bonsaksen and Breen-Franklin, 2019). Use of the ASSIST may be a helpful tool to begin a conversation on learning styles to help students understand how they learn and how they can improve studying methods during a graduate level program.

Study aim

This study aimed to provide measures of the associations between scores on the ASSIST scales and average exam grades in a sample of masters- and doctoral-level occupational therapy students in the USA, while adjusting for age, gender and independent studying. The results from the study may inform occupational therapy educators in the USA regarding assessment and advising strategies to facilitate student success.

Methods

Design and setting of the study

This cross-sectional survey was conducted at a university in, Philadelphia, PA (identifying information removed for peer review), USA. The data were collected in November–December 2018.

Recruitment and participants

Students were invited to participate in the study provided they were enrolled in the relevant occupational therapy education program and were currently in the first and second year of professional study, before they went out on their level II fieldwork placements. All participants gave their informed consent to participate in the study. The sample size was comprised by 120 masters- and doctoral-level students, representing first year ($n = 61$, 50.8%) and second year professional students ($n = 59$, 49.2%). Ten students failed to complete all items that were used in the analysis for this study and were, therefore, removed from the sample. Once completed, the results were placed in a sealed envelope without identifiers and coded by a third party.

The youngest age group in the sample (18–21 years) comprised 20 students (18.2%), whereas 74 students (67.3%) were aged 22–25 years, 12 students (10.9%) were aged 26–30 years and four students (3.6%) were aged 31–35 years. Female students were in majority ($n = 107$, 89.2%) compared to male students ($n = 9$, 8.2%).

Measurement

Sociodemographic information, independent studying and average exam grade.

The students' age group (18–21 years, 22–25 years, 26–30 years and 31–35 years) and gender was reported as part of the questionnaire. Similarly, the questionnaire asked about the time spent on independent studying during a normal week (reported as number of hours) and the average obtained GPA. The students reported their GPA as ranging 2.5–2.9 (coded as 1), 3.0–3.4 (coded as 2) or 3.5–4.0 (coded as 3).

Approaches to studying.

The original ASSIST instrument (Tait *et al.*, 1998) consists of 52 statements to which the respondent rates the level of agreement (1 = disagree, 2 = disagree somewhat, 3 = unsure, 4 = agree somewhat, 5 = agree). Scale scores are calculated by adding the scores on the relevant items. The instrument items are organized into three main scales, commonly referred to as the deep, strategic and surface approaches to studying. Previous research has confirmed the three-factor structure of the ASSIST (Byrne *et al.*, 2004; Diseth, 2001; Entwistle *et al.*, 2000; Kreber, 2003; Valadas *et al.*, 2010), also within occupational therapy students samples (Bonsaksen *et al.*, 2019; Richardson *et al.*, 2005).

In this study, the short version of the ASSIST was used (Entwistle *et al.*, 2006; Tait *et al.*, 1998). A total of 18 items from the full 52-items version comprise the short version of the ASSIST, with 6 items belonging to each of the *deep*, *strategic* and *surface* scales. The factor structure of the short version has been purported to be identical to that of the full version, as the chosen items were those with the highest loadings on full version scales (Entwistle, 2017). However, when used with the

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current sample, some scale modifications were necessary to obtain a sound scale structure (Bonsaksen and Breen-Franklin, 2019). Resulting from the factor analysis, two items were removed from the surface approach scale, while one item was removed from the deep approach scale. The revised scales had satisfactory levels of internal consistency (mean inter-item correlations ranging between 0.20 and 0.34).

Data analysis
Associations were analyzed with unadjusted and adjusted logistic regressions. Dependent variable was exam grade ranging between 3.5 and 4.0 (recoded 1), versus all lower grades (recoded 0). The included independent variables were age group, gender, weekly hours spent on independent studying and the deep, strategic and surface approach scale scores. The adjusted analysis included all of the independent variables together, such that the effects of covariance between the predictors were canceled out. Effect sizes were reported as odds ratio (OR) with corresponding 95% confidence interval (95% CI). The OR indicated the change in odds for obtaining the favorable outcome (higher exam grade) for each point increase in the predictor variables. All analyses were performed using IBM SPSS version 24 (IBM Corporation, 2016). For all analyses, statistical significance was set at $\alpha < 0.05$.

Ethics
Approval for conducting the study was obtained from the Institutional Review Board at (Identifying information removed for peer review), where it received exempt status. The participants were informed that completing and returning the questionnaires was voluntary and that confidentiality would be maintained throughout the project. They were informed that there would be no negative consequences from opting not to participate in the study. No person-identifying information was collected; thus, the anonymity of the participants was ensured.

Results

Study approach scale scores and average grades
The scores on each of the three study approach scales are as shown in Table 1. The standardized scores, computed by dividing each of the scale scores on the relevant number of included items, indicated that the sample had higher scores on the strategic ($M = 4.0$) and deep approach scales ($M = 3.7$) and lower scores on the surface approach scale ($M = 2.9$). Two students (1.8%) had a GPA between 2.5 and 2.9, 38 students (34.5%) had GPA between 3.0 and 3.4, whereas the GPA of 69 students (63.3%) was 3.5 or above.

Table 1 ASSIST scale scores in the sample ($n = 110$)

Scales	Scores	Adjusted scores
Deep approach (*M* [*SD*])	18.5 (3.1)	3.7 (0.6)
Strategic approach (*M* [*SD*])	23.9 (4.0)	4.0 (0.7)
Surface approach (*M* [*SD*])	11.6 (3.7)	2.9 (0.9)

Note: Adjusted scores are raw scores divided by the number of items on the relevant scale

Associations with exam grades
Associations between exam grades and the independent variables are displayed in Table 2. Unadjusted associations with better exam grade were shown for female gender (OR: 6.90, 95% CI: 1.36–35.02), higher scores on the strategic study approach (OR: 1.16, 95% CI: 1.04–1.28) and lower scores on the surface study approach (OR: 0.89, 95% CI: 0.80–0.99).

The adjusted analysis showed that associations with better exam grade were retained for female gender (OR: 8.17, 95% CI: 1.25–53.28) and higher strategic approach scores (OR: 1.15, 95% CI: 1.02–1.30), whereas the association with surface approach scores was no longer significant. The association between exam grade and deep approach scores was not significant in any of the models.

Discussion
The results showed that higher scores on the strategic approach scale increased the odds of having obtained a good GPA. Female gender was strongly associated with a good GPA, but the small number of male students included in the analysis makes any further interpretation of this finding difficult.

The results indicated that students used the strategic approach to studying at a higher rate than both deep and surface learning study approaches. The score for the surface study approach was lower than the deep and strategic approaches to studying. This result may indicate that students understand to some degree that it is not enough for them to merely study the material for the particular exam; they must also synthesize the information learned to achieve a better grade. Students may understand that learning the material for the sake of one test or assignment is insufficient and does not help them earn a better grade.

This study found that there was a direct association between better grades (higher GPA) and the strategic approach to learning. Thus, this study confirms the instrumental importance of a strategic approach to learning for occupational therapy students in a graduate program of study. Previously, a range of studies with undergraduate students have found similar associations between higher strategic approach ratings and academic performance (Diseth and Martinsen, 2003; Bonsaksen *et al.*, 2017; Bonsaksen *et al.*, 2020). It is not surprising that strategic study behaviors are related to exam grades also for those studying at the graduate level. In fact, one may assume that adopting effective study behaviors becomes increasingly important for meeting the higher standards set in graduate education. Again, turning to the descriptive results, the higher ratings on strategic approach (compared with the ratings on the surface and deep approaches to learning) illustrate that the graduate students relied most strongly on this approach. Further, in view of the detected association, it is possible that the students' reliance on the strategic study approach partly accounts for their overall good academic performance.

Interestingly, the results indicated that the deep approach to studying was not associated with better grades for students. This is not as expected from theory (Tait *et al.*, 1998), which would suggest a positive relationship between deep approach scores and academic performance. However, empirical studies have questioned the logic behind the proposed

Table 2 Logistic regression analysis showing associations between study approach scores and exam grade ($n = 110$)

Independent variables	Unadjusted model			Adjusted model		
	OR	95% CI	p	OR	95% CI	p
Age group	1.20	0.66–2.18	0.55	1.51	0.72–3.14	0.28
Gender	6.90	1.36–35.02	<0.05	8.17	1.25–53.48	<0.05
Hours of independent studying	0.98	0.95–1.02	0.31	0.98	0.94–1.02	0.28
Deep approach score	0.96	0.84–1.09	0.50	0.90	0.77–1.05	0.18
Strategic approach score	1.16	1.04–1.28	<0.01	1.15	1.02–1.30	<0.05
Surface approach score	0.89	0.80–0.99	<0.05	0.92	0.82–1.04	0.17

Notes: Reference categories are lower age group, male gender, less time spent on independent studying and lower scores on the deep, strategic and surface study approach scales. Adjusted model parameters: Nagelkerke $R^2 = 0.22$, Cox and Snell $R^2 = 0.16$, Model $\chi^2 = 19.73$, $p < 0.01$. Hosmer Lemeshow: $\chi^2 = 6.62$, $p = 0.58$.

association between deep approach studying and academic results (Campbell and Cabrera, 2014; Herrmann *et al.*, 2017). Moreover, researchers have suggested that study behaviors appear in a broader context, e.g. the nature of the knowledge to be acquired and the type of assessment used to measure the students' learning. These and other factors may influence the nature of the associations between study approaches and students' exam grades. The results of this study of graduate occupational therapy students in the USA appear to confirm earlier studies of undergraduate occupational therapy students which found that the deep approach to learning do not necessarily correlate to better grades (Diseth and Martinsen, 2003: Kusurkar *et al.*, 2013; Salamonson *et al.*, 2003).

Study limitations

There are several major limitations to this study. The sample size is a small convenience sampling of only one graduate-level occupational therapy school in the USA, and student participants comprised only first- and second-year students. Excluded from this study were students who were currently on their fieldwork level II placements, or who had recently completed their placements and were preparing for the doctoral capstone project and experiential, an extraneous variable that potentially impacted the results. These factors limit the generalizability of the results. In addition, the outcome measure (exam grade) was dichotomized into high versus low, instead of graded steps. Thus, this study examined an association with obtaining a good grade, rather than a linear relationship between two continuous variables. Finally, there were few men in the sample, which makes it difficult to assess the significant association between male gender and poorer grades.

Conclusion and implications

Higher scores on the strategic approach to studying were associated with better grades among graduate occupational therapy students in the USA. Thus, students who want to perform well academically are encouraged to use study behaviors comprised by the strategic approach to studying. In practical terms, this would mean using behaviors such as organizing one's time for studying, working steadily instead of postponing until the last minute and spending the required effort on study tasks. Faculty and supervisors may want to encourage students to use these and other strategies that may be helpful to the students' learning process.

Information regarding study approaches may help inform educational practice in graduate level occupational therapy education programs. Educators may not only want to focus on what and how students must learn but also develop varied outcome measures that students will understand and which measure course objectives. Understanding student study approaches may help educators develop outcome measures that students comprehend that also incorporate learning strategies to enable students to enter the profession of occupational therapy as qualified, well-rounded generalists.

Faculty may consider advising students who are struggling individually on a regular basis to discuss grade requirements and the skills necessary for students to meet graduate program requirements. It may also be helpful to administer the short version of the ASSIST scales to graduate occupational therapy students during their first semester as a way to help them understand their learning strategies. It may prove useful to engage students in a discussion of learning strategies and best ways to learn occupational therapy concepts required of entry-level practitioners. Student understanding of these different study approaches may help to inform them regarding the different types of study approaches and the correlation between these approaches and obtaining good grades.

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