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# Validation of the Approaches and Study Skills Inventory for Students (ASSIST) using accounting students in the USA and Ireland: a research note

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## Abstract

This paper examines the validity of the Approaches and Study Skills Inventory for Students (ASSIST) for use with accounting students in the United States (USA) and Ireland. Using factor analysis, the three expected learning approaches – deep, strategic and surface apathetic – were clearly identified. Furthermore, comparable factor patterns were revealed for both cohorts of students. These findings offer US and Irish accounting educators the opportunity to develop a better understanding of the learning of their students and the potential to undertake comparative research.

*Keywords:* approaches to learning, ASSIST, US and Irish accounting students

## Introduction

Quality student learning is a key objective of higher education. Students' approaches to learning have a powerful influence on the learning outcomes achieved and gaining an understanding of these approaches is a crucial pre-requisite to designing and implementing effective teaching and learning strategies (Ramsden, 1985; Biggs, 1987; Entwistle *et al.*, 2002). A substantial body of research has demonstrated that learning approaches are highly sensitive to the learning context (Ramsden, 1987; Laurillard, 1997, p.136; Prosser and Trigwell, 1999, pp. 58–82). One of the implications of this is that fine-grained discipline specific studies are warranted (Meyer and Eley, 1999; Neumann, 2001; Lucas, 2001). In light of the increasingly complex demands of accounting education, there is a need to develop greater insights, using both qualitative and quantitative methods, into how accounting students approach their learning (Gow *et al.*, 1994; Sharma, 1997; Beattie *et al.*, 1997; Booth *et al.*, 1999). While a small number of studies have measured accounting students' learning approaches using a variety of standard instruments, few have reported on the psychometric properties of the instruments used. Moreover, most of this research has been conducted in Australasia and the United Kingdom (UK), despite calls for such research in other countries, particularly in the US (Williams *et al.*,

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1988; Stout and Rebele, 1996). Hence, the purpose of this paper is to examine the validity of the latest version of a popular instrument for use with accounting students in the USA and Ireland, thereby facilitating institutional and international comparative research.

The remainder of the paper is structured as follows. The first section explores the nature of learning approaches and their measurement and is followed by a review of prior studies on learning approaches within the accounting discipline. The subsequent section describes the research method and the results of the study are then presented and discussed. The paper concludes by considering the implications of the findings.

### **Approaches to learning and their measurement**

An approach to learning concerns both a student's intention and how he/she relates to a learning task (Ramsden, 1985, 1987). It is not a personal characteristic of a student, rather it is a way of describing how he/she responds to a task in a given context (Ramsden, 1987; Biggs, 1993). Early research used a qualitative, interview-based method known as phenomenography to investigate the observed variation in learning approaches (Marton and Booth, 1997, p. 16). Two distinct approaches were identified: deep and surface. Students adopting a deep approach have a personal interest in learning and set out with the intention of understanding the material. They interact critically with the arguments put forward, relate them to their prior knowledge and experiences and evaluate the extent to which conclusions are justified by the evidence presented. In contrast, students employing a surface approach focus on memorising facts in an unrelated manner. They fail to interact personally with the material and are constrained by the specific task. Importantly, a deep approach to learning is associated with high quality learning outcomes, whereas surface learning is related to poor quality outcomes (Marton and Saljo, 1976; Trigwell and Prosser, 1991).

Subsequent research, recognising the pervasive influence of assessment on student learning, identified an additional approach (Ramsden, 1979). This third approach is known as a strategic approach and it describes the intentions and activities of students who are primarily focused on achieving the highest possible grades. These students are concerned with both the academic content and the requirements of the assessment system and they use whatever strategy will maximise their chances of academic success (Watkins, 2000).

The early phenomenographic research soon led to the development of a number of instruments to operationalise the various learning approach constructs for use with large groups of students (Richardson, 2000, p. 61). While the *Study Process Questionnaire* (Biggs, 1987) is very popular, particularly in Australia where it was developed, Richardson (2000, p. 86) contends that the *Approaches to Studying Inventor* (ASI) devised by Entwistle and his colleagues in the UK (Entwistle and Ramsden, 1983), is 'probably the most widely used questionnaire on student learning in higher education'. This paper examines the most recent version of the ASI, the *Approaches and Study Skills Inventory for Students* (ASSIST) (ASSIST, 1997), for use with accounting students in the USA and Ireland.

### **Accounting students' approaches to learning**

Over the past twenty years, several reports have expressed concern over the quality of accounting education (American Accounting Association (AAA), 1986; Arthur Andersen *et al.*, 1989; Accounting Education Change Commission (AECC), 1990; Mathews, 1990; International

Federation of Accountants (IFAC), 1996; American Institute of Certified Public Accountants, 1998; Albrecht and Sack, 2000). Although these reports have emerged in different contexts, they are remarkably consistent in the issues raised and the recommendations proposed. They contend that, if accounting graduates are to meet the future challenges of the profession, they must develop the knowledge, skills and competencies necessary to become independent, lifelong learners. To achieve these high quality learning outcomes, accounting educators must create environments that promote deep learning. Designing programmes that will successfully foster this learning will require educators to develop a sound understanding of the complex and contingent nature of accounting students' learning approaches (Beattie *et al.*, 1997).

The small number of studies that have measured accounting students' learning approaches have yielded conflicting results. In some cases, students were found to favour a surface approach (Bowen *et al.*, 1987; Chan *et al.*, 1989; Booth *et al.*, 1999; Davidson, 2002), while in others, students showed no preference for any one approach (Sharma, 1997; Byrne *et al.*, 1999). Gow *et al.* (1994) reported that a deep approach to learning was dominant in the first year of study but that this preference declined in later years. Studies have also identified age and gender differences in approaches to learning among accounting students (Jones and Hassall, 1997; Duff, 1999).

When exploring the relationships between learning approaches and learning outcomes, Duff (1996) identified a relationship between deep learning and performance in advanced modules. However, in a later study he found no association between students' learning approaches and outcomes (Duff, 1997). Davidson (2002) found a link between a deep approach and performance on complex examination questions but no relationship between the surface approach and performance. In contrast, Booth *et al.* (1999) failed to identify a relationship between deep learning and performance, but they reported a significant negative relationship between surface learning and academic results. Deep and strategic approaches were positively associated with performance in a study by Byrne *et al.* (2002), while there was a negative association with the surface approach. Gender differences in the relationships were also observed.

The foregoing studies fail to present a clear and consistent picture of accounting students' approaches to learning. The difficulty in interpreting the results can be attributed to a number of issues. Firstly, different instruments have been used to measure students' approaches to learning. This variation hinders comparability and prevents the generalisability of the findings. Secondly, only a few studies have presented any evidence relating to the psychometric properties of the instruments (Duff, 1997, 1999; Byrne *et al.*, 1999, 2002). Instead, the majority of researchers have relied upon validation studies conducted in different settings. In so doing, they have assumed that students from different disciplines are commensurable in terms of their approaches to learning and that the theoretical constructs embodied in the instruments possess empirical integrity in different cultural contexts. It is difficult to sustain these assumptions. The premise that there is no variation in the constructs of approaches to learning in different disciplinary settings is highly questionable and several studies have reported variation in learning approaches across disciplines (Entwistle and Ramsden, 1983, p. 50–52; Watkins, 1986). Other research has identified differences in the conceptual and empirical composition of the factors capturing the approaches to learning of students from different countries and cultures (Kember and Gow, 1990; Speth and Brown, 1988; Schmeck, 1988; Richardson, 1995; Smith *et al.*, 1998). In particular, variation between Western and Asian students has been reported (Hattie and Watkins, 1981; Emilia and Mulholland, 1991; Smith *et al.*, 1998).

As many of the aforementioned accounting studies have not considered these disciplinary and cultural issues, it is possible that their findings are not dependable. Moreover, Duff (2001) contends that the failure of accounting education researchers to report reliability coefficients

and validity data inevitably compromises the results of their research. Consequently, he recommends relying on validity information from prior studies only when the current sample is based on a similar norm group. In all other instances, researchers should confirm that the instrument demonstrates both internal reliability and construct validity for the data in their study.

Hence, identifying an instrument that can be validly applied to measure accounting students' approaches to learning in different contexts has much to offer. Such an instrument will facilitate comparative national and international research and will enable accounting educators to identify exemplary teaching and learning practices. Accordingly, the objective of this paper is to determine whether the ASSIST is suitable for use with US and Irish students within the discipline of accounting.

## Research method

### *The ASSIST*

The ASI was developed by Entwistle and his colleagues at Lancaster University in the late 1970s and its composition was influenced by the findings from other studies exploring student learning in higher education (e.g., Hudson, 1968; Parlett, 1970; Marton and Saljo, 1976; Biggs, 1976, 1979; Pask, 1976). Over the years, a number of revisions were made to the original ASI, however, it was felt that these amended instruments sacrificed the conceptual integrity of the original ASI and some did not possess the necessary psychometric properties (Tait *et al.*, 1998; Richardson, 2000, p. 123). Thus, in the late 1990s, following extensive research, the instrument was revised and renamed as ASSIST. Comparing this new inventory to the immediate prior version of the ASI, the deep approach was extended to include a *collaboration* subscale capturing students' desire to consult with others. The definition of a strategic approach was broadened to embrace a *monitoring effectiveness* subscale, which encompasses metacognition and self-regulation and the surface approach was renamed surface apathetic as the revised scale placed more emphasis on ineffective studying. Furthermore, a number of subscales were classified as related motives. Following the initial use of the ASSIST and further testing, *collaboration* was removed from the deep scale and *monitoring effectiveness* was reclassified as a related motive within the strategic scale. Additionally, an *alertness to assessment demands* subscale was introduced as part of the strategic approach, thereby moving this approach closer to its original definition where good study habits combine with the intention to maximise performance. It is this amended version of the ASSIST which is used in the current study (ASSIST, 1997). Ultimately, the ASSIST contains 52 statements<sup>1</sup> and respondents indicate their agreement with each statement using a five-point Likert scale where 1 = *disagree* and 5 = *agree*. The statements are combined into 13 subscales of four items each, which are then further grouped into the three main scales: deep, strategic and surface apathetic. The scales of the ASSIST may be seen in Table 1.

### *Data collection*

This study was conducted with students studying accounting in the USA and Ireland. The ASSIST was distributed to students during accounting classes and they were instructed to complete it in respect of their study of accounting. The purpose of the research was explained and

<sup>1</sup>Some examples of these statements are: 'Some of the ideas I come across on the course I find really gripping' (Deep – interest in ideas) 'I organise my study time carefully to make the best use of it' (Strategic – time management) 'I tend to read very little beyond what is actually required to pass' (Surface apathetic – syllabus-boundness).

**Table 1.** Factor pattern matrix and Cronbach alpha values of ASSIST for US and Irish samples

	<i>US sample</i>			<i>Irish sample</i>			<i>Cronbach <math>\alpha</math></i>	
	<i>Factor</i>			<i>Factor</i>			<i>US</i>	<i>Irish</i>
	<i>I</i>	<i>II</i>	<i>III</i>	<i>I</i>	<i>II</i>	<i>III</i>		
<b>Deep</b>							<b>0.82</b>	<b>0.84</b>
Seeking meaning	0.05	-0.03	<b>0.71</b>	0.00	<b>0.72</b>	0.01	0.55	0.63
Relating ideas	-0.14	-0.05	<b>0.68</b>	-0.13	<b>0.77</b>	-0.07	0.59	0.59
Use of evidence	-0.01	0.09	<b>0.76</b>	-0.02	<b>0.82</b>	0.01	0.49	0.59
Interest in ideas ( <i>RM</i> )	0.12	-0.06	<b>0.57</b>	0.11	<b>0.44</b>	-0.21	0.67	0.69
<b>Strategic</b>							<b>0.87</b>	<b>0.87</b>
Organised study	<b>0.72</b>	0.01	0.09	<b>0.83</b>	0.01	-0.02	0.55	0.63
Time management	<b>0.87</b>	-0.03	-0.04	<b>0.93</b>	-0.10	-0.02	0.77	0.74
Alertness to assessment	0.21	0.01	<b>0.35</b>	0.21	0.24	0.17	0.56	0.63
Achieving ( <i>RM</i> )	<b>0.81</b>	-0.05	0.01	<b>0.75</b>	0.07	-0.06	0.63	0.68
Monitoring effectiveness ( <i>RM</i> )	<b>0.38</b>	0.01	<b>0.49</b>	<b>0.33</b>	<b>0.45</b>	0.03	0.61	0.61
<b>Surface Apathetic</b>							<b>0.80</b>	<b>0.83</b>
Lack of purpose	-0.19	<b>0.43</b>	-0.07	<b>-0.31</b>	-0.05	<b>0.54</b>	0.68	0.75
Unrelated memorising	0.15	<b>0.94</b>	-0.08	0.03	0.11	<b>0.73</b>	0.57	0.59
Syllabus boundness	-0.10	<b>0.40</b>	-0.09	-0.21	0.17	<b>0.52</b>	0.55	0.64
Fear of failure ( <i>RM</i> )	0.03	<b>0.66</b>	0.15	0.10	0.08	<b>0.58</b>	0.72	0.74

Note: RM = related motive.

students were assured that their answers were confidential and would only be used for the purposes of the study.

The US data were collected from 298 full-time students attending a private university located on the eastern coast, which has a student population of approximately 16,000 full-time and 7,000 part-time students. Sixty eight per cent of the respondents were taking their first course in accounting and 32% were taking an intermediate course. Their mean age was 20.5 years and 53% of respondents were male with 47% female. The Irish sample contained 437 full-time students from a publicly-funded university with a student population of approximately 6,500 full-time and 2,000 part-time students. Sixty four per cent of the respondents were taking their first course in accounting, 20% an intermediate course and 16% an advanced course. The respondents had a mean age of 19.3 years. Fifty one per cent were female and 49% were male.

Guilford (1956) and Gorsuch (1983) suggest that a sample size of at least 200 is required to undertake factor analysis. Additionally, Bryant and Yarnold (1995) suggest that the case to variable ratio should be no lower than five. Both of the samples in this study exceed the minimum suggested by these tests.

## Results and discussion

Cronbach alpha values were extracted to test the internal reliability of each of the main scales and subscales. As may be seen in Table 1, the alpha values for the main scales range from 0.80 to 0.87 for the US sample and from 0.83 to 0.87 for the Irish sample, indicating high

**Table 2.** Factor correlation matrices

	<i>US sample</i>			<i>Irish sample</i>		
	<i>Factor I</i>	<i>Factor II</i>	<i>Factor III</i>	<i>Factor I</i>	<i>Factor II</i>	<i>Factor III</i>
Factor I	1	-0.261	0.546	1	-0.54	-0.129
Factor II	-0.261	1	-0.167	-0.54	1	0.211
Factor III	0.546	-0.167	1	-0.129	0.211	1

levels of internal consistency. The alpha values for the subscales for the US sample range from 0.49 to 0.77 and from 0.59 to 0.75 for the Irish students.<sup>2</sup> The values for both the main scales and the subscales are acceptable for scales of their respective length and type (Entwistle *et al.*, 2000) and are similar to the values reported in other studies which used the ASSIST (Byrne *et al.*, 1999; Tait *et al.*, 1998; Entwistle *et al.*, 2000; Diseth, 2001). Factor analysis was carried out on the subscales using maximum likelihood extraction. Both the eigenvalue greater than one criterion and the scree test indicated that a three factor solution should be extracted. This solution also provided the best balance between interpretability and the percentage of the variance explained.<sup>3</sup> While recent research has suggested the appropriateness of a two factor model in some contexts (Entwistle *et al.*, 2000; Flood and Wilson, 2004), in this study, the three factor model produced a better measure of fit, yielding acceptable relative chi-square values of 1.98 and 3.68 for the US and Irish samples respectively (Marsh and Hocevar, 1985). Given the correlation between the factors (see Table 2), the extracted factor matrix was rotated to oblique simple structure using a direct oblimin rotation. For both samples the resulting three factors are those that were expected conceptually and can be clearly identified as deep, strategic and surface apathetic, as shown in the pattern matrix in Table 1. Pattern matrix coefficients, hereafter referred to as the loadings, in excess of 0.60 are considered high and those between 0.30 and 0.60 as moderate (Kline, 1994, p.6). In the social sciences, it is common practice to only report loadings in excess of 0.30 (Kline, 1994, p. 180). Thus, these loadings have been highlighted in bold italics in Table 1 and are the focus of the subsequent analysis. It should be noted that the three factor solution explains 61% of the variance for both samples.

There are few noticeable differences in the overall factor patterns of both groups. Three subscales (*seeking meaning, relating ideas and use of evidence*) included in the deep approach have high loadings for both groups, while the *interest in ideas* subscale has a moderately high loading. *Organised study, time management and achieving* all have high loadings for both samples on the strategic scale. While *monitoring effectiveness* loaded as anticipated on the strategic scale, it also loaded on the deep scale. This cross loading is consistent with results reported elsewhere (Byrne *et al.*, 1999; Entwistle *et al.*, 2000; Diseth, 2001) and as noted by Entwistle *et al.* (2000, p. 37) it is 'entirely understandable in conceptual terms'. Additionally, Entwistle and McCune (2004) contend that some interconnection between domains should not be seen as a weakness, rather it is an inevitability of the seamlessness of human behaviour. The remaining strategic subscale, *alertness to assessment demands*, does not load as expected. For the US students it loads on the

<sup>2</sup>An item attrition analysis was conducted on the only subscale yielding an alpha <0.5 ('use of evidence' with the US sample), but the removal of any of the items led to lower alpha values.

<sup>3</sup>In addition, an item level factor analysis was conducted. The outcome shows little variation from the analysis conducted on the subscales and a three factor pattern is supported.

deep factor, while it fails to load at a significant level on any factor for the Irish students. To investigate this further an item level factor analysis was carried out to examine the behaviour of the items included in the subscale. This examination revealed that only one of the four statements in the subscale loaded for the US sample, while none of the items loaded for the Irish students. The problems associated with this subscale are not wholly unexpected. Entwistle *et al.* (2000) indicate alertness to assessment is more likely to be relevant to students in the final stages of their studies, whereas the students in this study are primarily taking their first course in accounting. In the validation of the ASSIST with Norwegian students on an introductory philosophy module, Diseth (2001) also reported difficulties with the behaviour of the *alertness to assessment demands* subscale.

For the surface apathetic scale, *unrelated memorising* loads highly for both samples. *Fear of failure* has a high loading for the US students and a moderate loading for the Irish group, while *syllabus boundness* and *lack of purpose* show moderate loadings for both samples. However, it must be noted that the *lack of purpose* subscale also loads negatively, albeit only at 0.31, on the strategic scale for the Irish students. Smith *et al.* (1998) argue that, when a subscale loads substantively on more than one factor and the difference between the loadings is greater than 0.20, the highest loading is considered to be distinctive. Thus, in this study the loading of the *lack of purpose* subscale on the surface apathetic scale is deemed dominant.

Before considering the implications of this study, it is appropriate to identify some limitations. Firstly, the ASSIST measures the broad learning approaches of a group of students, but it fails to fully capture the complexity of individualised ways of learning and studying. Thus, to explore the individual richness of student learning, combining qualitative and quantitative research may have much to offer educators. Secondly, a sample drawn from more than two universities might also have been useful to capture greater variation in students. However, these limitations also provide an opportunity for future research to apply the instrument to additional samples. Such studies would also facilitate further examination of the subscales of the ASSIST which did not behave exactly as expected in the current study, i.e. *alertness to assessment demands* and *monitoring effectiveness*.

The benefits of this study far outweigh its limitations. The results indicate that the students in both samples similarly construe the underlying constructs of the three distinctive approaches to learning. This similarity may be attributed to a range of factors including: the consistency of the goals of higher education, the closeness of the traditions of the accounting profession in both countries and possible resemblances of the two samples in terms of biodata variables. The primary implication of these findings is that the ASSIST is a robust instrument that can be used with confidence to measure accounting students' approaches to learning in the USA and Ireland. Using the ASSIST, educators can determine how students respond, or relate, to different subjects and different learning tasks and they can also monitor changes in students' learning approaches over time. Such research is likely to prompt accounting educators to interrogate the role they play in influencing learning approaches and to consider ways of appropriately aligning their curriculum, teaching and assessment strategies, ultimately leading to the design of initiatives focused on improving learning approaches and outcomes. Additionally, these studies might initiate a dialogue between educators and students regarding their respective expectations and responsibilities for student learning in higher education. Moreover, the findings of this study facilitate inter-institutional research across boundaries and offer educators the opportunity to explore the strengths of alternative teaching and learning strategies. In summary, if accounting educators and other stakeholders are serious about developing accounting education in the twenty-first century then a programme of research focused on student learning is essential.

## Conclusion

The purpose of this study was to validate the ASSIST for use with accounting students in two different countries thereby facilitating institutional and comparative research into students' approaches to learning. Factor analysis was conducted on data gathered from a sample of students in the USA and Ireland. The resulting factor patterns clearly identified the expected deep, strategic and surface apathetic approaches. Accordingly, it is concluded that the ASSIST is an instrument that will yield valid and reliable scores for assessing the learning approaches of accounting students in both countries.

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