

Approaches to studying and perceptions of academic quality in a short web-based course

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Abstract

Both the Course Experience Questionnaire (CEQ) and the Revised Approaches to Studying Inventory (RASI) were administered to students who were taking an introductory web-based course in computing. The constituent structure of both questionnaires was preserved in this distinctive context, and the students' scores on the individual scales of the CEQ and the RASI shared over 80% of their variance. Students' perceptions of academic quality were positively associated with their adoption of desirable approaches to studying and negatively associated with their adoption of undesirable approaches. Students' academic attainment was positively associated with their perceptions of academic quality and their adoption of a strategic approach to studying and negatively associated with their adoption of a surface approach to studying.

Introduction

Interview-based research carried out in the 1970s showed that students in higher education use a number of qualitatively different approaches to studying (see Marton *et al.*, 1984):

- a “deep” approach focused on understanding the meaning of their course materials;
- a “strategic” approach focused on achieving the highest possible marks or grades; and
- a “surface” approach focused on being able to reproduce the course materials for the purposes of academic assessment.

Further investigations showed that whether students adopt one approach to studying rather than another depends upon their perceptions of the content, the context and the demands of specific learning tasks (Laurillard, 1979; Marton, 1976; Ramsden, 1979).

A number of attempts have been made to investigate the relationship between approaches to studying and students' perceptions of their academic environment using formal questionnaires. Ramsden and Entwistle (1981) devised the Approaches to Studying Inventory (ASI) to obtain self-reports on 16 aspects of studying and the Course Perceptions Questionnaire to obtain self-reports on eight aspects of the academic context. In practice, however, there was little overlap between students' scores on the two instruments (see Entwistle and Ramsden, 1983, 184–189; Meyer and Parsons, 1989). This might be due to inherent weaknesses in both questionnaires (Meyer and Muller, 1990; Richardson, 1990; see also Richardson, 2000, 90–96, 101–105).

Ramsden (1991) developed a new instrument, the Course Experience Questionnaire (CEQ), to measure students' perceptions of the academic quality of their courses. Since 1993, an adapted version of the CEQ has been administered annually to all students graduating from Australian universities, and an extended version of the CEQ was proposed by Wilson *et al* (1997) for use as a research tool. Lawless and Richardson (2002) modified the CEQ and a short version of the ASI for use in distance education and administered both instruments to students taking courses by distance learning. They found a close association between the two instruments, such that the students' scores on the two questionnaires shared nearly half of their respective variance.

Most research on approaches to studying in higher education has been concerned with students taking courses delivered either by face-to-face instruction in campus-based institutions or by correspondence (possibly with support from broadcast materials and face-to-face tutorials) in distance education. In the light of the increasing use of information technology in both campus-based and distance education, Richardson and Price (2003) attempted to replicate the findings obtained by Lawless and Richardson in students taking electronically delivered courses. They too found a close relationship between the CEQ and the short version of the ASI, such that the students' scores on the two questionnaires shared nearly two-thirds of their variance.

Unfortunately, Richardson and Price's study suffered from three problems. First, some of the subscales in their short version of the ASI proved to have relatively poor internal consistency. Second, although a factor analysis of the scores on the CEQ confirmed its value as a measure of perceived academic quality, it also revealed a second factor whereby students who felt that their course allowed choice and enabled them to develop generic skills also tended to feel that their workload was inappropriate. Richardson and Price suggested that this dimension might be peculiar to more highly focused courses where topics of broader interest that went beyond the syllabus were seen by students as being irrelevant to meeting the demands of assessment.

This relates to the third problem, which is that the students surveyed by Richardson and Price were taking postgraduate courses in computer science, in most cases with a view to obtaining professional accreditation. Most of these students would have been highly proficient in the use of information technology and entirely comfortable

with the idea of using such technology as an educational medium. Different results might be obtained in students who were less at ease with information technology. Accordingly, the following study was carried out with students who were taking an introductory web-based course in computing. They were surveyed using the CEQ and Entwistle *et al's* (2000) Revised Approaches to Studying Inventory (RASI). As before, the aim was to investigate concomitant variations in the students' perceptions of the quality of their courses and in the approaches to studying that they adopted on those courses.

Method

Context

The Open University was founded in 1969 to offer degree programmes by distance education throughout the United Kingdom. It accepts all applicants over the normal minimum age of 18 onto its courses without imposing formal entrance requirements, subject only to limitations of numbers on specific courses. Originally, nearly all of its courses were delivered by specially prepared correspondence materials, combined with television and radio broadcasts, video and audio recordings, tutorial support at a local level and (in some cases) week-long residential schools. Nevertheless, in more recent years, the Open University has made increasing use of computer-based support, particularly CD-ROMs, dedicated websites and conferencing links.

The course chosen for study was TU170 "Learning Online: Computing with Confidence". This course is presented twice a year, runs for 12 weeks and is worth 10 credit points at Level 1. It is summarised for prospective students on the University's website in the following manner:

This introduction to computing and the online world is also a chance to brush up your learning skills and a general introduction to learning online with the OU [Open University]. It teaches basic computer skills such as word-processing and spreadsheet applications, so that through practice you become a confident computer user; and culminates in a section on making the most of the internet, including effective use of e-mail, computer conferences and the production of a web page. This is not a course for "techie" — you are assumed to be fairly new to computing. You need to be able to learn without close supervision, but with lots of online help and supported by a personal tutor.

A survey of students who took this course in May–July 2001 found that the majority (70%) had been using a computer for more than a year, but that they had taken the course to gain a general understanding of computers and the internet (79%), to acquire experience of writing web pages (71%), to develop their IT study skills (69%) and to gain familiarity with the web (66%).

The course is structured into four sections: "Joining the online world"; "Effective groupwork"; "Computing with confidence"; and "Web skills". It is delivered through a website, computer conferencing, CD-ROMs, supplementary printed information and practice learning materials. Students are assigned to a tutorial group and communicate with their tutor and other students by means of e-mail and computer conferencing.

ing. The course is assessed by a piece of written work submitted at the end of the course, for which participation in online groupwork is obligatory.

Participants

A sample of 400 participants was drawn at random from the 831 students who had completed the presentation of this course in May–July 2002. (The remaining students received a separate survey carried out for internal quality-assurance purposes.)

Materials and procedure

The 36-item CEQ had been modified for use with Open University students by Lawless and Richardson (2002), and the RASI was modified along the same lines. In particular, references to “lecturers” or “teaching staff” were removed so that the items referred to tutors or course materials, as appropriate. Participants were asked to think about their course as a whole rather than about particular units, topics or tutors. For both instruments, they were asked to indicate their level of agreement with each item on a 5-point scale from 5 for “definitely agree” to 1 for “definitely disagree”; the midpoint (3) was “only to be used if the statement doesn’t apply to you or if you really find it impossible to give a definite answer”. The survey was mailed after the submission of coursework early in August 2002, and a reminder was sent later that month.

Results

Completed copies of the questionnaire were received from 178 students, and this represents a response rate of 44.5%. This would be considered to be adequate for a postal survey (Babbie, 1973, 165; Kidder, 1981, 150–151). Of these respondents, 75 (or 42%) were male and 103 (or 58%) were female. Their ages ranged from 19 to 85 with a mean of 44.9 years. These students were classified according to their highest educational qualifications on joining the University into four categories: “low”, less than GCE Ordinary Level or the equivalent; “lowish”, less than two passes at GCE Advanced Level or the equivalent; “medium”, two or more passes at GCE Advanced Level or the equivalent; and “high”, beyond GCE Advanced Level. There were 19, 63, 28 and 57 students in the respective categories, with missing data for 11 respondents.

CEQ scores

It was found that 16 students had failed to provide a response to one or more of the 36 items in the CEQ. In most cases, these were isolated instances, and it was thought appropriate to regard them as items that did not apply to the student in question; according, they were coded as “3” (“doesn’t apply to me”). However, four students had missed four or more items, and so they were dropped from further analysis.

As adapted by Lawless and Richardson (2002) for use in distance education, the CEQ consists of seven scales. The scores on each scale are obtained by averaging the responses to the items in question, and an overall measure of perceived quality is obtained by averaging the scores on the seven scales. Relevant descriptive statistics are presented in Table 1. The mean scores are fairly positive, with the highest scores on Appropriate Assessment and Good Materials and the lowest scores on Student Choice.

Table 1: Descriptive statistics and factor loadings for the seven scales of the CEQ

Scale	Mean	Standard deviation	Coefficient alpha	Correlation with satisfaction	Factor loading
Appropriate Assessment	4.17	0.77	0.72	0.33	0.37
Appropriate Workload	3.48	1.01	0.82	0.51	0.49
Clear Goals and Standards	3.47	0.97	0.78	0.59	0.75
Generic Skills	3.77	0.88	0.86	0.65	0.67
Good Materials	3.96	0.86	0.70	0.71	0.77
Good Tutoring	3.57	0.93	0.88	0.47	0.67
Student Choice	3.01	0.79	0.60	0.42	0.63
Overall perceived quality	3.63	0.61	0.81	0.77	

Note: $N = 174$. The possible range of scores on all seven scales and on the overall measure of perceived quality is from 1 to 5, where 5 is the most favourable response.

The internal consistency of the seven scales, as measured by Cronbach's (1951) coefficient alpha, is good by conventional criteria (Robinson *et al*, 1991).

As in previous research, a 37th item ("In general, I am satisfied with the quality of TU170") was included to validate the CEQ as a measure of perceived quality. All of the students who provided usable responses to the CEQ had responded to this item. Their mean response on a scale from 1 to 5 was 4.10, 79.3% of the students indicated their agreement with the item, and the modal response was 5; all of these findings imply a high degree of satisfaction with this course. Table 1 shows the correlation coefficients between the students' scores on the seven scales of the CEQ and their satisfaction scores. The latter were significantly correlated with their scores on all seven scales of the CEQ but were most strongly associated with perceptions of having received good materials, generic skills, clear goals and an appropriate workload.

A factor analysis was carried out on the participants' scores on the seven scales using principal axis factoring. This yielded just one factor, and the loadings of this factor on the seven scales are shown in Table 1. All seven scales showed loadings greater than 0.30, although the highest loadings were found on Good Materials, Clear Goals, Generic Skills and Good Tutoring. This demonstrates the construct validity of the CEQ as a measure of perceived academic quality.

RASI scores

It was found that 14 students had failed to provide a response to one or more of the 52 items in the RASI. These were again in most cases isolated instances, and it was thought appropriate to regard them as items that did not apply to the student in question; accordingly, they were coded as "3" ("doesn't apply to me"). However, three students had missed four or more items, and so they were dropped from further analysis.

As constructed by Entwistle *et al* (2000), the RASI consists of 13 subscales subsumed within three major scales, and the scores on each scale and subscale are obtained by

Table 2: Descriptive statistics and factor loadings for the 13 subscales of the RASI

Subscale	Mean	Standard deviation	Coefficient alpha	Factor loadings		
				1	2	3
Deep Approach						
Seeking Meaning	16.09	2.75	0.68	<i>0.64</i>	0.29	0.03
Relating Ideas	15.24	2.66	0.61	<i>0.84</i>	-0.07	-0.02
Use of Evidence	15.84	2.47	0.55	<i>0.54</i>	0.21	-0.01
Interest in Ideas	16.09	2.90	0.67	<i>0.56</i>	0.13	-0.11
Total	63.26	8.66	0.82			
Strategic Approach						
Organised Studying	13.88	3.24	0.62	0.02	<i>0.77</i>	-0.05
Time Management	14.83	3.63	0.78	0.01	<i>0.79</i>	-0.07
Alertness to Assessment Demands	14.15	2.79	0.45	0.13	<i>0.33</i>	0.30
Achieving	16.24	2.62	0.56	0.09	<i>0.67</i>	-0.25
Monitoring Effectiveness	17.16	2.44	0.74	0.29	<i>0.45</i>	-0.10
Total	76.26	11.02	0.79			
Surface Approach						
Lack of Purpose	6.79	3.28	0.77	-0.09	-0.15	<i>0.47</i>
Unrelated Memorising	9.46	2.99	0.55	-0.17	0.02	<i>0.65</i>
Syllabus-Boundness	11.37	3.19	0.54	-0.29	0.05	<i>0.47</i>
Fear of Failure	12.60	4.18	0.75	0.23	-0.17	<i>0.64</i>
Total	40.22	9.69	0.66			

Note: $N = 175$. The possible range of scores on all 13 subscales is from 4 to 20. Factor loadings greater than 0.30 in absolute magnitude are shown in italics.

summing the responses to the relevant items. Relevant descriptive statistics are presented in Table 2. The mean scores on the subscales measuring Deep Approach and Strategic Approach were higher than those on the subscales measuring Surface Approach. The internal consistency of most scales, as measured by coefficient alpha, is generally satisfactory by conventional criteria.

A factor analysis on the scores on the 13 subscales of the RASI using principal axis factoring and oblique rotation yielded three factors, and the results are shown in Table 2. Factor loadings greater than 0.30 in magnitude were regarded as being salient for the purposes of interpretation (see Tabachnik and Fidell, 1996, 677). The first factor showed salient loadings on the four subscales measuring Deep Approach, the second factor showed salient loadings on the five subscales measuring Strategic Approach, and the third factor showed salient loadings on the four subscales measuring Surface Approach. The first factor was highly correlated with the second ($r = +0.55$), but the third factor was largely independent of both the first factor ($r = -0.18$) and the second factor ($r = -0.20$). These results demonstrate the construct validity of the RASI as a measure of distinct approaches to studying.

Usable data on both the CEQ and the RASI were obtained from 173 students. A multivariate analysis of variance showed that the two sets of scores shared 82.6% of their variance. The overall measure of perceived quality from the CEQ was positively correlated with the students' total scores on Deep Approach ($r = 0.31$) and with their total scores on Strategic Approach ($r = 0.27$) but was negatively correlated with their total scores on Surface Approach ($r = -0.44$).

Coursework marks

Although this course was simply assessed on a pass/fail basis, the students were assigned marks for their coursework on a scale from 0 to 100. The mean of the marks that were awarded to the 178 respondents was 59.3 with a standard deviation of 26.6.

The respondents' marks were significantly correlated with the overall measure of perceived quality from the CEQ ($r = +0.46$). In fact, they were significantly correlated with their scores on all seven scales of the CEQ but were most strongly associated with perceptions of having received appropriate workload, appropriate assessment and generic skills. They were also significantly correlated with their ratings of general satisfaction with the course ($r = +0.48$).

With regard to the RASI, the respondents' marks were significantly correlated with their total scores on Strategic Approach ($r = 0.22$), but this was due to significant correlations with their scores on merely two of the five subscales: Achieving ($r = +0.36$) and Monitoring Effectiveness ($r = 0.26$). The respondents' marks were significantly but negatively correlated with their total scores on Surface Approach ($r = -0.36$), and this was due to significant correlations with their scores on three out of the four subscales: Lack of Purpose ($r = -0.41$), Unrelated Memorising ($r = -0.34$), and Fear of Failure ($r = -0.18$). Finally, the respondents' marks were not significantly correlated with their total scores on Deep Approach and were significantly correlated with their scores on only one of the four subscales, Interest in Ideas ($r = 0.19$).

A multiple regression analysis was carried out to try to predict the respondents' marks based on their overall scores on the CEQ and the RASI. This found significant contributions of both the overall measure of perceived quality ($\beta = 0.37$) and their total scores on Surface Approach ($\beta = -0.18$). However, when the effects of these variables had been statistically controlled, there was no significant contribution of either their total scores on Deep Approach or their total scores on Strategic Approach. In other words, the apparent effect of the latter variable upon the students' performance was merely an artefact due to its positive relationship with the overall measure of perceived quality and its negative relationship with the total score on Surface Approach.

Discussion

Before examining the detailed findings, it is worth noting the very diverse nature of the student population. There was a broad parity with regard to gender (indeed, a moderate preponderance of women), but the respondents' ages ranged from 19 years to 85

years. There was considerable variation also in their prior qualifications. This reflects the Open University's multiple role in providing access to higher education for people who lack the normal entrance qualifications; in providing opportunities for people who did not enter (or did not succeed in) higher education on leaving secondary school, even though they had the qualifications to do so; and in providing continuing education for people who have already participated in traditional higher education.

Despite the tremendous diversity of the students and the highly distinctive nature of the course that they had taken, both of the questionnaires used in this study turned out to be highly robust. All the scales in the CEQ and most of the subscales in the RASI exhibited satisfactory internal consistency. Students' perceptions of their academic context, as measured by the CEQ, were found to be multidimensional but dominated by a single overarching construct that could be interpreted as perceived academic quality. Students' reports of how they had studied during this course were also multidimensional but conformed to the three qualitatively distinct approaches that have been identified in qualitative research since the 1970s (Marton *et al.*, 1984).

The results of the present investigation also confirmed the existence of an intimate relationship between students' approaches to studying and their perceptions of their academic environment. This is consistent with the idea that the choice of one approach to studying rather than another depends on students' perceptions of the content, the context and the demands of their courses (Laurillard, 1979; Marton, 1976; Ramsden, 1979; see also Scouller, 1998). More specifically, the results confirm the pattern identified by Lawless and Richardson (2002) and by Richardson and Price (2003) whereby perceptions of academic quality are positively related to the more desirable forms of studying (a deep approach and, to a lesser extent, a strategic approach) and negatively related to the less desirable forms of studying (a surface approach).

The present investigation went beyond previous studies in relating the students' perceptions of academic quality and their approaches to studying to their level of attainment. On the one hand, students who rated the course as being of higher quality also tended to obtain better marks for their coursework. This might be because more able students were more likely to have received positive feedback from their tutors (Marsh, 1987). On the other hand, students who adopted a surface approach to studying also tended to obtain poorer marks for their coursework. In other words, the assessment criteria appeared to discourage inappropriate or undesirable approaches to studying, though they did not actually encourage more appropriate or desirable ones. Similar findings were obtained by Scouller (1998) in campus-based students assessed by coursework.

As mentioned earlier, most of the students who were surveyed by Richardson and Price (2003) would have been highly proficient in the use of information technology and comfortable with the idea of using such technology as an educational medium. In contrast, the participants in the present study were relative novices in computing who were being introduced to online learning perhaps for the first time. Even so, they rated their

course fairly positively on the CEQ, both in absolute terms and in comparison with students taking other Open University courses (Lawless and Richardson, 2002; Richardson and Price, 2003), and they also expressed a very high degree of general satisfaction with the course. Finally, they were much more likely to report desirable forms of learning than undesirable forms of learning according to their responses to the RASI.

Nevertheless, the main lesson from the present study is that the conceptual frameworks and the methodological tools that have been devised to investigate perceptions of academic quality and approaches to studying in traditional, face-to-face settings are just as appropriate and useful for investigating perceptions of academic quality and approaches to studying in web-based courses. The rapidly increasing use of information technology may make out of date many assumptions about teaching and learning in higher education, but it does not seem to have rendered obsolete the basic apparatus for understanding the nature and origin of variations in student learning.

Acknowledgements

I am grateful to Jenny Curtis and Nick Haycox of the Open University's Survey Office for preparing and distributing the survey, to Sarah Young for providing the results of the previous survey of students taking this course and to Linda Price and Simon Rae for their comments on an earlier version of this paper.

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