# Perceptions of Academic Quality and Approaches to Studying Among Students with Print Disabilities Enrolled in Distance Education

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**Abstract**

*A mailed survey compared the experiences of distance-learning students with print disabilities who were supported by audio recordings of materials, the experiences of students with print disabilities who were supported by an electronic system that permitted more effective access to the same materials, and the experiences of students with no disability. Findings showed that the students with print disabilities rated their courses less favorably and were more likely to adopt a surface approach to studying than were students with no disability. However, the students with print disabilities were just as likely to adopt a deep or a strategic approach to studying as were the students with no disability, and there was no significant difference in the satisfaction ratings of the students with and without print disabilities. Finally, there were no significant differences between the experiences of the students with print disabilities who used the electronic system and the experiences of those who used audio recordings, and no significant differences between the experiences of the students with print disabilities who were visually impaired and the experiences of those with another kind of disability.*

Research based upon interviews with students in higher education in the 1970s identified three predominant approaches to studying: a deep approach based on understanding the meaning of course materials; a surface approach based on memorizing course materials for the purposes of assessment; and a strategic approach based on obtaining the highest grades. The choice of one approach over another appeared to depend upon the content, the context, and the demands of particular learning tasks (e.g., Laurillard, 1979; Marton, 1976; Ramsden, 1979). Subsequent investigations using questionnaire surveys have confirmed that the same students may adopt different approaches, depending upon the academic demands of different courses (Eley, 1992), the quality of the instruction (Vermetten, Lodewijks, & Vermunt, 1999), and the nature of the assessment (Scouller, 1998).

These findings imply that changes in the design and delivery of specific courses should affect how students tackle those courses. In particular, they imply that the choice of appropriate course design, instructional methods, and modes of assessment will induce desirable approaches to studying. Unfortunately, there is little empirical evidence to show that educational interventions can induce positive changes in students' approaches to studying (see Gibbs, 1992; Hambleton, Foster, & Richardson, 1998; Kember, Charlesworth, Davies, McKay, & Stott, 1997). Eley (1992) found considerable variation in how different students perceived the requirements of the same courses. If the effects of contextual factors are mediated by the students' perceptions of their academic environment, educational interventions will not be effective in changing students' approaches to studying unless they also bring about changes in the students' perceptions.

To measure variations in students' perceptions of the quality of their programs, Ramsden (1991) developed the Course Experience Questionnaire (CEQ). This instrument contained 30 items in five scales: Appropriate Assessment; Appropriate Workload; Clear Goals and Standards; Emphasis on Independence; and Good Teaching. Since 1993, an adapted version of the CEQ (containing only 17 of the original 30 items) has been given annually to all new graduates from Australian universities. This includes a sixth scale concerned with the fostering of generic skills, and it is supplemented by an item concerning students' general level of satisfaction with their programs. For research purposes, Wilson, Lizzio, and Ramsden (1997) argued that the original CEQ should be augmented with

the Generic Skills scale to yield a 36-item questionnaire, and they presented evidence from Australian students to demonstrate the reliability and validity of this instrument.

Investigations have shown that the CEQ provides a reliable and valid way of monitoring the perceptions of both students and alumni across a variety of subjects and in several different countries (see Richardson, 2005a, for a review). Investigations have also shown an intimate relationship between students' perceptions of the quality of their courses and programs and the approaches to studying that they have adopted on those courses and programs. That is, students who have positive perceptions are more likely to adopt a deep approach or a strategic approach and are less likely to adopt a surface approach than are students who have negative perceptions. This relationship has been found in face-to-face institutions (Kreber, 2003; Sadlo & Richardson, 2003), in distance education (Lawless & Richardson, 2002; Richardson, 2005b), and even when the courses are delivered wholly online (Richardson, 2003; Richardson & Price, 2003).

These investigations have been carried out with samples from the general population of students in postsecondary education. Several recent studies have explored the experiences of students who have a hearing loss, not only in face-to-face institutions (Richardson, Barnes, & Fleming, 2004; Richardson, MacLeod-Gallinger, McKee, & Long, 2000) but also in distance education (Richardson, Long, & Foster, 2004; Richardson, Long, & Woodley, 2003; Richardson & Woodley, 1999, 2001a, 2001b). Researchers have even examined the experiences of students who have a hearing loss that they have not disclosed to their institutions (Richardson, Long, & Woodley, 2004). Nevertheless, virtually nothing is known about either perceptions of academic quality or approaches to studying in students who have other forms of disablement.

The present investigation was concerned with the heterogeneous population of students who are print disabled. This population encompasses students who are blind or partially sighted, students who are dyslexic or have other specific learning difficulties, and students with various physical or motor difficulties. What the different groups have in common is that they find handling and using printed materials difficult or even impossible. They have traditionally been supported in higher education by the provision of recordings of materials on audiocassettes, but electronic systems are now available that enable students to search and retrieve information from the course materials in a far more effective manner. The present study compared the experiences of students with print disabilities who were using one such system with the experiences of students with print disabilities who were supported by audiocassettes and with the experiences of students taking the same courses who had no form of disablement.

## Method

*Context*

The Open University was created in 1969 to provide degree courses by distance learning across the United Kingdom. Originally, nearly all its courses were delivered by correspondence materials, combined with television and radio broadcasts, video and audio recordings, tutorial support at a local level, and (in some courses) week-long residential schools. However, in recent years, the University has made increasing use of computer-based support, especially CD-ROMs, dedicated websites, and computer-mediated conferencing. It accepts applicants over the minimum age of 18 onto its courses without imposing any formal entrance requirements.

University courses in the United Kingdom are weighted using a system of credit points where one year's full-time study consists of courses worth 120 credit points and a Bachelor's degree is awarded on the basis of the satisfactory completion of courses worth 360 credit points (480 credit points for some Scottish programs lasting four years). Most of the Open University's courses run from February to October and are weighted at either 30 or 60 credit points (equating to one quarter and one half of full-time study, respectively). Students may register for two or more courses up to a maximum of 120 credit points, but the majority of students register for only one course at a time. Courses that contribute to the undergraduate program can count towards a general degree or to a wide range of subject-based degrees. Most courses are assessed by a combination of written assignments (submitted by surface or electronic mail) and traditional unseen examinations (taken at regional assessment centers).

The University provides extensive human and technical support for students who have disabilities. Roughly 1,800 students have identified themselves as print disabled (from a total population of more than 220,000 students). Traditionally, these students have been provided with recordings on audiocassettes, but these are difficult to access and cumbersome to store. (A course worth 60 points typically requires about 100 C90 audiocassettes.) The ReadOut software was devised to provide such students with a convenient means of accessing their course materials by means of a personal computer and an enabling interface (synthetic speech, text magnification, printed or refreshable Braille, and natural-speech audio recordings of the text).

In the ReadOut production process, printed course material is stored in an electronic document archive, and mark-up scheme is applied in an HTML/XML format. The marked-up text is presented on an autocue system in a booth in which volunteers record the text as digital audio. The text is broken down into the smallest manageable chunks for identification, and the electronic text and digital audio versions are synchronized automatically by the readers. Any essential diagrams or other graphical images in the text are converted into text or audio descriptions. Finally, the electronic text and natural-speech audio recordings of the printed material are distributed to students on DVDs or CD-ROMs together with the navigational software. For further information, see "ReadOut Course Materials" (2003).

*Participants*

The target sample for the study consisted of the 214 students who had taken a course with The Open University in 2003, who had been supported by ReadOut software, and who were available to be surveyed in December of that year under the University's procedures (which, among other things, prohibit a student from being asked to participate in more than two research projects in any year).

The second sample consisted of students who had been supported by audiocassettes during 2003 and who were available to be surveyed. For each student in the ReadOut sample, a student from this sample was sought who had taken the same course and who was of the same gender and similar age (within five years). It was possible to find matches for 193 of the ReadOut sample, and these students constitute the tapes sample.

The third sample consisted of students who had not disclosed any disability to the University and who were available to be surveyed. As before, for each student in the ReadOut sample, a student was sought who had taken the same course and who was of the same gender and similar age. It was possible to find matches for 213 of the ReadOut sample, and these students constitute the nondisabled sample.

*Materials and Procedure*

The 36-item version of the CEQ had been adapted by Lawless and Richardson (2002) for use at The Open University. References to "lecturers" or "teaching staff" were removed so that items referred to tutors or course materials. Lawless and Richardson confirmed the intended structure of the CEQ, except that the Good Teaching scale split into two new scales related to Good Materials and Good Tutoring. The defining items of the seven scales are shown in Table 1. A 37th item, "In general I am satisfied with the quality of OU [Open University] courses," is often included with the CEQ to validate its use as a measure of perceived quality, and that item was used in this study.

The Revised Approaches to Studying Inventory (RASI) was devised by Entwistle, Tait, and McCune (2000). It consists of 52 items in 13 subscales that measure different aspects of studying. A deep approach is defined by four subscales: Seeking Meaning, Relating Ideas, Use of Evidence, and Interest in Ideas. A strategic approach is defined by five subscales: Organized Studying, Time Management, Alertness to Assessment Demands, Achieving, and Monitoring Effectiveness. A surface approach is defined by four subscales: Lack of Purpose, Unrelated Memorizing, Syllabus-Boundness, and Fear of Failure.

Richardson (2005b) modified the RASI for use in distance education and obtained responses from 2,177 students who were taking seven different courses with The Open University. The results confirmed the internal consistency of the RASI, and a factor analysis of the students' subscale scores confirmed its intended structure.

The CEQ and the RASI were combined in a mailed survey. For each item, the participants were asked to indicate the extent of their agreement or disagreement with the relevant statement on a 5-point scale from 5 for *definitely agree* to 1 for *definitely disagree*, where 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 students who were print disabled received additional questions concerning both their disabilities and their use of different kinds of support facilities. The questionnaire was prepared in a large font (Arial 14-point). In a covering letter, the participants were offered the opportunity either to receive the questionnaire on a floppy disk or to complete the survey by telephone. (No participant chose either of these offers.) The survey was distributed in early December 2003, and a reminder was sent out later that month.

## Results

An alpha level of .05 was used for all statistical tests. The differentiation ratio $ç^2$ (eta squared) was used as a measure of effect size for univariate comparisons that were based on an interval scale. This is the proportion of the variance in a dependent variable that is explained by an independent variable. Cohen (1988, pp. 285–288) suggested that a value of $ç^2$ of .0099 could be regarded as a small effect, a value of .0588 as a medium effect, and a value of .1379 as a large effect.

Table 1

*Defining Items of the Seven Scales in the Adapted Version of the CEQ*

| Subscale | Defining item |
|---|---|
| Appropriate Assessment | Assessment on OU [Open University] courses seems to be more to do with testing what you've memorized than with testing what you've understood.[a] |
| Appropriate Workload | The sheer volume of work to be got through in OU courses means that you can't comprehend it all thoroughly.[a] |
| Clear Goals and Standards | On OU courses, it is always easy to know the standard of work that is expected of you. |
| Generic Skills | As a result of taking OU courses, I feel more confident about tackling unfamiliar problems. |
| Good Materials | The teaching materials for OU courses really try to make topics interesting to students. |
| Good Tutoring | Tutors make a real effort to understand the difficulties that students may be having with their work. |
| Student Choice | Students on OU courses are given a lot of choice in the work they have to do. |

[a]Items to be scored in reverse.

Of the 620 participants, 214 (or 35%) returned copies of the questionnaire. The response rates for the three samples were: ReadOut, 34%; tapes, 33%; nondisabled, 37%. A chi-square test found that the difference among these response rates was not statistically significant, $X^2(2, N = 620) = 0.73$, $p = .69$. The overall response rate was somewhat low for a mailed survey (cf. Babbie, 1990, p. 182; Kidder, 1981, pp. 150–151), but the students who were print disabled were not significantly less likely to return copies of the questionnaire than were the students with no disability, even though it had been administered in a print-based format.

The students with print disabilities were asked to indicate by checking yes/no boxes whether they had a vi-

sual impairment, a specific learning disability, or a disability that caused fatigue, or whether they made use of audiotapes or ReadOut software for some other reason. Of the 136 students with print disabilities, 56 indicated that they had a visual impairment, 65 that they had a specific learning difficulty, 83 that they had a disability causing fatigue, and 45 that they made use of audiotapes or ReadOut software for some other reason (79 checked two or more boxes).

The first of these groups is likely to be more homogeneous than the others (see Simkiss, Garner, & Dryden, 1998), so it was decided to subdivide the respondents from the ReadOut and tapes samples into those who stated that they had a visual impairment and those who did not. Consequently, there were five groups of respondents in total. For the purposes of data analysis, the variation among the five groups was divided into four contrasts: the students with print disabilities versus the students with no disability; the students with visual impairment versus those with another kind of disability; the ReadOut students versus the tapes students; and the interaction between the two latter comparisons. Table 2 summarizes certain demographic characteristics of the five groups.

Table 2

*Demographic Characteristics of Five Groups of Students*

| | No | Visual impairment | | Other disability | |
|---|---|---|---|---|---|
| | disability | ReadOut | Tapes | ReadOut | Tapes |
| *n* | 78 | 28 | 28 | 45 | 35 |
| Gender | | | | | |
| Male | 24 | 13 | 11 | 13 | 5 |
| Female | 54 | 15 | 17 | 32 | 30 |
| Prior qualifications | | | | | |
| Low | 2 | 4 | 4 | 11 | 7 |
| Lowish | 28 | 8 | 10 | 12 | 9 |
| Medium | 19 | 5 | 6 | 7 | 6 |
| High | 24 | 9 | 7 | 13 | 12 |
| Missing | 5 | 2 | 1 | 2 | 1 |
| Age (years) | | | | | |
| Mean | 43.0 | 46.1 | 48.0 | 39.2 | 39.6 |
| Range | 22–74 | 27–72 | 24–64 | 18–81 | 23–63 |

Of the 214 respondents, 66 (or 31%) were men and 148 (or 69%) were women. A chi-square test showed that the gender distribution did not differ between the students with print disabilities and the students with no disability, $X^2(1, N = 214) = 0.00$, $p = .99$. However, the proportion of men was higher among the students with visual impairment (43%) than among the students with another kind of disability (23%), $X^2(1, N = 136) = 6.40$, $p = .01$. This gender difference may reflect the differential prevalence of different kinds of disability between men and women or the differential willingness of men and women with different kinds of disability to undertake courses by distance learning. Nevertheless, the gender distribution did not differ between the ReadOut students and the tapes students, $X^2(1, N = 136) = 1.66$, $p = .20$, and there was no significant interaction between the two latter comparisons, $X^2(1, N = 136) = 0.29$, $p = .59$.

Information concerning educational qualifications on joining The Open University was available for 203 of the respondents. These were classified into four categories in comparison with the U.K. General Certificate of Education (GCE): "low" (less than GCE Ordinary Level, the public examination previously taken at the age of 16, or the equivalent); "lowish" (less than two passes at GCE Advanced Level, the higher school-leaving examination normally taken at the age of 18, or the equivalent); "medium" (two or more passes at GCE Advanced Level, the normal minimum entry requirement at U.K. universities, or the equivalent); and "high" (qualifications beyond GCE Advanced Level). The proportions of respondents within these four subgroups were 14%, 33%, 21%, and 32%, respectively.

A chi-square test showed that the distribution of prior qualifications differed between the students with print disabilities and the students with no disability, $X^2(3, N = 203) = 12.38$, $p < .01$: 20% of the students with print disabilities had joined The Open University with low educational qualifications, but only 3% of the students with no disability had done so. This difference may reflect the impact of the students' preexisting disabilities on their prior academic attainment. However, the distribution of prior qualifications did not differ between the students with visual impairment and the students with another kind of disability, $X^2(3, N = 130) = 1.85$, $p = .60$, or between the ReadOut students and the tapes students, $X^2(3, N = 130) = 0.37$, $p = .95$, and there was no interaction between the two latter comparisons, $X^2(3, N = 130) = 0.68$, $p = .88$.

The ages of the respondents on December 31, 2003, varied from 18 to 81, with an overall mean of 42.7 years. An analysis of variance found no significant difference in age between the students with print disabilities and the students with no disability, $F(1, 209) = 0.02$, $p = .90$, $ç^2 = .00$, but the students with visual impairment tended to be significantly older than the students with another kind of disability, $F(1, 209) = 14.94$, $p < .01$, $ç^2 = .07$. This may reflect the increasing prevalence of visual impairment with increasing age but the congenital nature of other disabilities, particularly certain kinds of specific learning difficulty. There was no significant difference in age between the ReadOut students and the tapes students, $F(1, 209) = 0.33$, $p = .57$, $ç^2 = .00$, and there was no significant interaction between the two latter comparisons, $F(1, 209) = .13$, $p = .13$, $ç^2 = .00$.

*CEQ Scores*

On examining the responses to the CEQ, it was found that 19 students had failed to give a response to one or more of the 36 items. In most cases, these were isolated instances, and it was felt appropriate to regard them as items that did not apply to the student; accordingly, they were coded as "3" (i.e., "doesn't apply to me"). Nevertheless, three respondents missed more than three items and were dropped from further analysis. Thus, the final sample consisted of 211 students who provided usable sets of data. The scales defined by Lawless and Richardson (2002) contain varying numbers of items. Thus, the students were assigned scores on the seven scales by computing the mean response across the relevant items, and their scores varied between 1 and 5.

Descriptive statistics are provided in Table 3. The scores on all the scales showed a satisfactory level of internal consistency, with values of Cronbach's (1951) coefficient alpha between .66 and .86. An exploratory factor analysis was carried out on the scale scores; the loadings of the seven scales on the single factor that emerged are shown in Table 3. All seven scales showed loadings greater than .50 in magnitude, which indicates that this factor may be interpreted as an overall measure of perceived academic quality. A second-order factor-based scale, labeled "Perceived Academic Quality," was constructed by computing each student's mean score across the seven CEQ scales (cf. Pedhazur & Schmelkin, 1991, pp. 625–626). This scale exhibited good internal consistency, as shown by a coefficient alpha of .85.

All but one of the students who had provided usable responses to the CEQ had responded to the 37th item ("In general I am satisfied with the quality of OU courses"). The overall mean on a scale from 1 to 5 was 4.42, and more than 50% of the students produced a response of 5 (*definitely agree*), implying a high degree of satisfaction. The correlation coefficient between their responses to this item and the second-order factor-based scale was +.73, and this provides further support for the

Table 3

*Descriptive Statistics of Students' Scores on the CEQ*

| Scale | No. of items | *M* | *SD* | Coefficient alpha | Factor loadings |
|---|---|---|---|---|---|
| Appropriate Assessment | 4 | 3.94 | 0.85 | .70 | .53 |
| Appropriate Workload | 5 | 3.09 | 0.89 | .73 | .56 |
| Clear Goals and Standards | 4 | 3.65 | 0.97 | .81 | .78 |
| Generic Skills | 6 | 3.80 | 0.85 | .85 | .67 |
| Good Materials | 3 | 4.22 | 0.82 | .75 | .79 |
| Good Tutoring | 9 | 3.78 | 0.83 | .86 | .71 |
| Student Choice | 5 | 3.46 | 0.76 | .66 | .68 |
| Perceived Academic Quality | | 3.70 | 0.62 | .85 | |

interpretation of the latter as a measure of perceived academic quality.

Table 4 shows the mean scores obtained by the five groups of students. A multivariate analysis of variance showed a significant difference between the scores obtained by the students with print disabilities and the students with no disability, $F(7, 200) = 2.43$, $p = .02$. However, there was no significant difference between the students with visual impairment and those with another kind of disability, $F(7, 200) = 0.45$, $p = .87$, or between the ReadOut students and the tapes students, $F(7, 200) = 0.22$, $p = .98$. Finally, there was no interaction between the two latter comparisons, $F(7, 200) = 0.62$, $p = .74$.

Univariate tests showed that the students with no disability produced higher scores than did the students with print disabilities on Appropriate Assessment, $F(1, 206) = 13.37$, $p < .01$, ç² = .06; Appropriate Workload, $F(1, 206) = 8.06$, $p < .01$, ç² = .04; Clear Goals and Standards, $F(1, 206) = 5.07$, $p = .03$, ç² = .02; Good Materials, $F(1, 206) = 4.18$, $p = .04$, ç² = .02; Good Tutoring, $F(1, 206) = 6.03$, $p = .02$, ç² = .03; and Student Choice, $F(1, 206) = 4.98$, $p = .03$, ç² = .02. The difference on Generic Skills was in the same direction but was not statistically significant, $F(1, 206) = 2.03$, $p = .16$, ç² = .01.

To determine whether these effects resulted from differences among the groups in terms of demographic variables, this analysis was repeated with the covariates of gender, age, and prior education. (Gender was coded as 0 for men and 1 for women, and prior education was coded from 1 for low to 4 for high.) The only significant effect of the covariates was that prior education was positively correlated with scores on Appropriate Workload, â= +0.15, $F(1, 193) = 4.56$, $p = .03$. When the possible effects of the covariates had been statistically controlled, all of the differences observed between the students with print disabilities and the students with no disability remained significant except for the difference on Good Materials, $F(1, 193) = 3.38$, $p = .07$, ç² = .02.

Table 4 also lists the mean scores obtained by the five groups on Perceived Academic Quality. An analysis of variance showed that the students with no disability obtained higher scores than did the students with print

Table 4

*Mean Scores Obtained by Five Groups of Students on the CEQ*

| Scale | No disability | Visual impairment | | Other disability | |
|---|---|---|---|---|---|
| | | ReadOut | Tapes | ReadOut | Tapes |
| *N* | 78 | 27 | 27 | 44 | 35 |
| Appropriate Assessment | 4.22 | 3.77 | 3.73 | 3.72 | 3.92 |
| Appropriate Workload | 3.32 | 3.01 | 2.93 | 2.88 | 3.02 |
| Clear Goals and Standards | 3.85 | 3.54 | 3.51 | 3.52 | 3.56 |
| Generic Skills | 3.91 | 3.77 | 3.83 | 3.67 | 3.69 |
| Good Materials | 4.38 | 4.22 | 4.15 | 4.03 | 4.14 |
| Good Tutoring | 3.96 | 3.64 | 3.60 | 3.61 | 3.82 |
| Student Choice | 3.61 | 3.52 | 3.25 | 3.29 | 3.42 |
| Perceived Academic Quality | 3.89 | 3.64 | 3.57 | 3.53 | 3.65 |
| General satisfaction | 4.54 | 4.42 | 4.52 | 4.20 | 4.34 |

disabilities, $F(1, 206) = 11.19$, $p < .01$, $ç^2 = .05$. However, there was no significant difference between the students with visual impairment and those with another kind of disability, $F(1, 206) = 0.01$, $p = .91$, $ç^2 = .00$, or between the ReadOut students and the tapes students, $F(1, 206) = 0.07$, $p = .80$, $ç^2 = .00$. Also, there was no interaction between the two latter comparisons, $F(1, 206) = 0.76$, $p = .39$, $ç^2 = .00$. The difference between the students with print disabilities and the students with no disability remained significant when the effects of gender, age, and prior education had been statistically controlled, $F(1, 193) = 9.79$, $p < .01$, $ç^2 = .05$, and the covariates themselves had no significant effect, $F(3, 193) = 0.08$, $p = .97$.

Table 4 also shows the mean ratings of general satisfaction produced by the five groups. The modal response was 5 for all five groups, again implying a high level of satisfaction. An analysis of variance found no significant difference between students with print disabilities and the students with no disability, $F(1, 205) = 1.73$, $p = .19$, $ç^2 = .01$; no significant difference between the students with visual impairment and the students with another kind of disability, $F(1, 205) = 1.59$, $p = .21$, $ç^2 = .01$, no significant difference between the ReadOut students and the tapes students, $F(1, 205) = 0.56$, $p = .46$, $ç^2 = .00$, and no significant interaction between the two latter comparisons, $F(1, 205) = 0.02$, $p = .89$, $ç^2 = .00$. This was also true when the effects of gender, age, and prior education had been statistically controlled, and the covariates themselves had no significant effect, $F(3, 192) = 2.00$, $p = .12$.

*RASI Scores*

On examining the responses to the RASI, it was found that 17 students had not provided a response to one or more of the 52 items. In most cases, these were again

Table 5

*Descriptive Statistics of Students' Scores on the RASI*

| Subscale | *M* | *SD* | Coefficient alpha | Factor loadings 1 | 2 | 3 |
|---|---|---|---|---|---|---|
| Deep Approach | | | | | | |
| Seeking Meaning | 16.69 | 2.68 | .68 | .63 | .02 | .23 |
| Relating Ideas | 15.82 | 2.76 | .56 | .84 | .10 | -.04 |
| Use of Evidence | 16.69 | 2.40 | .59 | .67 | .21 | .20 |
| Interest in Ideas | 17.09 | 2.92 | .72 | .69 | -.09 | .16 |
| Total | 66.29 | 8.97 | .85 | | | |
| Strategic Approach | | | | | | |
| Organized Studying | 13.92 | 3.39 | .59 | -.01 | -.15 | .78 |
| Time Management | 15.46 | 3.85 | .83 | -.09 | -.12 | .85 |
| Alertness to Assessment Demands | 14.20 | 3.18 | .60 | .04 | .20 | .49 |
| Achieving | 16.46 | 2.73 | .62 | .29 | -.16 | .57 |
| Monitoring Effectiveness | 17.38 | 2.41 | .55 | .30 | .02 | .55 |
| Total | 77.42 | 12.01 | .82 | | | |
| Surface Approach | | | | | | |
| Lack of Purpose | 7.16 | 3.50 | .72 | -.44 | .40 | -.04 |
| Unrelated Memorizing | 10.17 | 3.34 | .58 | -.12 | .68 | -.01 |
| Syllabus-Boundness | 11.72 | 3.03 | .48 | -.44 | .15 | .09 |
| Fear of Failure | 13.55 | 4.18 | .76 | .09 | .71 | -.08 |
| Total | 42.60 | 9.82 | .64 | | | |
| Factor correlations | | | | | | |
| Factor 1 | | | | 1.00 | -.23 | .49 |
| Factor 2 | | | | -.23 | 1.00 | -.08 |
| Factor 3 | | | | .49 | -.08 | 1.00 |

isolated instances, and it was felt appropriate to regard them as items that did not apply to the student in question. Consequently, they were coded as "3" (i.e., "doesn't apply to me"). However, five respondents had missed more than three items and were dropped from any further analysis. Accordingly, the final sample consisted of 209 students who had provided usable sets of data. Following Entwistle et al. (2000), respondents were assigned a score on each subscale by computing the total of the responses given to the four relevant items; thus, these scores varied between 4 and 20. Scale scores were similarly assigned by computing the total scores across the relevant subscales.

Descriptive statistics are shown in Table 5. The scores on the scales and the subscales showed a satisfactory level of internal consistency, with values of Cronbach's (1951) coefficient alpha between .55 and .85, except for Syllabus-Boundness. An exploratory factor analysis was carried out on the subscale scores, and the three factors that emerged were subjected to oblique rotation. The loadings of the 13 subscales on the three rotated factors are shown in Table 5. As illustrated, the factors represented a deep approach, a surface approach, and a strategic approach, respectively, but two of the subscales from the Surface Approach scale showed salient negative loadings on the factor associated with a deep approach. A large positive correlation was found between the first and third factors, a small negative correlation was found between the first and second factors, and essentially no relationship was found between the second and third factors.

Of the 214 respondents, 208 provided usable sets of data on both the CEQ and the RASI. Their scores on Perceived Academic Quality according to the CEQ were positively correlated with their scores on Deep Approach, $r = +.44$, and their scores on Strategic Approach, $r = +.39$, but they were negatively correlated with their scores on Surface Approach, $r = -.61$. All but one of these students provided ratings of their general satisfaction. These ratings were positively correlated with their scores on Deep Approach, $r = +.39$, and their scores on Strategic Approach, $r = +.31$, but they were negatively correlated with their scores on Surface Approach, $r = -.48$. All of these correlation coefficients were statistically significant ($p < .01$ using two-tailed tests), confirming the intimate relationship between students' perceptions and approaches to studying.

Table 6 shows the mean scores obtained by the five groups of students on the 13 subscales of the RASI. A multivariate analysis of variance showed that there was a significant difference between the scores obtained by the students with print disabilities and those obtained by the students with no disability, $F(13, 192) = 3.63$, $p < .01$. However, there was no significant difference between the students with visual impairment and those with another kind of disability, $F(13, 192) = 0.81$, $p = .65$, or between the ReadOut students and the tapes students, $F(13, 192) = 0.73$, $p = .74$, and there was no interaction between the two latter comparisons, $F(13, 192) = 0.68$, $p = .78$. Univariate tests showed that the students with print disabilities produced higher scores than did the students with no disability on Time Management, $F(1, 204) = 4.80$, $p = .03$, $ç^2 = .02$; Unrelated Memorizing, $F(1, 204) = 21.41$, $p < .01$, $ç^2 = .09$, Syllabus-Boundness, $F(1, 204) = 6.05$, $p = .02$, $ç^2 = .03$; and Fear of Failure, $F(1, 204) = 11.55$, $p < .01$, $ç^2 = .05$.

To determine whether these effects resulted from differences among the groups in terms of demographic variables, this analysis was repeated with the covariates of gender, age, and prior education. The only significant effects of the covariates were that prior education was negatively correlated with scores on Unrelated Memorizing, $â = -0.26$, $F(1, 191) = 15.84$, $p < .01$, and Fear of Failure, $â = -.255$, $F(1, 191) = 13.25$, $p < .01$. When the possible effects of the covariates had been statistically controlled, all the differences observed between the students with print disabilities and the students with no disability remained significant.

A further multivariate analysis of variance found a significant difference between the students with print disabilities and the students with no disability in terms of their scores on the three major scales of the RASI, $F(3, 202) = 9.23$, $p < .01$. However, there was no significant difference between the students with visual impairment and those with another kind of disability, $F(3, 202) = 1.26$, $p = .29$, or between the ReadOut students and the tapes students, $F(3, 202) = 0.22$, $p = .88$. Also, there was no interaction between the two latter comparisons, $F(3, 202) = 0.40$, $p = .75$. Univariate tests showed that the students with print disabilities produced higher scores than did the students with no disability on Surface Approach, $F(1, 204) = 19.35$, $p < .01$, $ç^2 = .09$, but not on Deep Approach, $F(1, 204) = 0.28$, $p = .60$, $ç^2 = .00$, or Strategic Approach, $F(1, 204) = 1.06$, $p = .31$, $ç^2 = .01$.

This analysis, too, was repeated with the covariates of gender, age, and prior education. Age was positively correlated with scores on Strategic Approach, $â = +0.19$, $F(1, 191) = 6.20$, $p = .01$, and prior education was negatively correlated with scores on Surface Approach, $â = -0.18$, $F(1, 191) = 6.99$, $p = .01$. When the possible effects of the covariates had been statistically controlled, the students with print disabilities still produced significantly higher scores on Surface Approach than did the students with no disability, $F(1, 191) = 16.25$, $p < .01$, $ç^2 = .07$.

Table 6

*Mean Scores Obtained by Five Groups of Students on the RASI*

| Scale | No disability | Visual impairment | | Other disability | |
|---|---|---|---|---|---|
| | | ReadOut | Tapes | ReadOut | Tapes |
| *N* | 76 | 28 | 27 | 43 | 35 |
| Deep Approach | | | | | |
| Seeking Meaning | 16.66 | 17.25 | 17.30 | 16.47 | 16.14 |
| Relating Ideas | 15.67 | 16.71 | 15.89 | 15.56 | 15.69 |
| Use of Evidence | 16.39 | 17.64 | 17.04 | 16.51 | 16.54 |
| Interest in Ideas | 17.30 | 17.11 | 17.48 | 16.53 | 16.97 |
| Total | 66.03 | 68.71 | 67.70 | 65.07 | 65.34 |
| Strategic Approach | | | | | |
| Organized Studying | 13.71 | 14.71 | 13.89 | 13.84 | 13.86 |
| Time Management | 14.71 | 16.36 | 16.00 | 15.70 | 15.66 |
| Alertness to Assessment Demands | 14.01 | 15.25 | 13.78 | 14.09 | 14.20 |
| Achieving | 16.55 | 16.54 | 16.48 | 16.37 | 16.29 |
| Monitoring Effectiveness | 17.37 | 17.61 | 17.30 | 17.35 | 17.34 |
| Total | 76.36 | 80.46 | 77.44 | 77.35 | 77.34 |
| Surface Approach | | | | | |
| Lack of Purpose | 6.64 | 7.18 | 7.85 | 7.81 | 6.91 |
| Unrelated Memorizing | 8.76 | 10.36 | 10.63 | 11.74 | 10.80 |
| Syllabus-Boundness | 11.01 | 11.68 | 11.93 | 12.21 | 12.51 |
| Fear of Failure | 12.29 | 13.75 | 14.96 | 13.93 | 14.57 |
| Total | 38.71 | 42.96 | 45.37 | 45.70 | 44.80 |

## Discussion

This study compared the experiences of three samples of students enrolled in distance education: (a) students with print disabilities supported by the ReadOut system; (b) students with print disabilities supported by audio recordings; and (c) students with no disability. In the original research design, the three samples of students had been individually matched. Although the individual matching was lost because of the failure to achieve a 100% response rate, the three samples of respondents were still matched at the group level in terms of age and gender. Even so, they were not matched in terms of prior qualifications, and the students with visual impairment were not matched with the students who had another kind of disability in terms of gender or age. The possible effects

of gender, age, and prior qualifications consequently must be taken into account when comparing the five groups in terms of their scores on the CEQ and the RASI.

This investigation has confirmed the conclusion of Lawless and Richardson (2002) that the CEQ is a robust instrument when used in the highly distinctive context of distance education. Individually, the seven scales exhibited levels of internal consistency that would be regarded as highly satisfactory by conventional research-based criteria (Nunnally, 1974, pp. 245–246; Robinson, Shaver, & Wrightsman, 1991). Collectively, they defined a single higher-order construct that could be interpreted as a measure of perceived academic quality. The CEQ can thus be recommended as a useful tool for monitoring the experiences of students both with and without disabilities in both face-to-face institutions and distance education.

The students with no disability produced more positive ratings of their courses than did the students with print disabilities. This difference occurred both on the measure of Perceived Academic Quality and on six of the seven scales that constitute the CEQ. The difference between the students with print disabilities and the students with no disability remained significant on five of the seven scales when the possible effects of demographic variables had been statistically controlled. The differences that arose on the measure of Perceived Academic Quality and on the Appropriate Assessment subscale would be characterized as medium effects on Cohen's (1988) criteria; hence they are likely to be of both theoretical and practical importance.

In short, students with print disabilities provided less favorable evaluations of their courses than did students with no disability, particularly in terms of their assessment but also with regard to workload, tutoring, the clarity of the goals, and the amount of choice. Since the two groups of students were taking the same courses, it would appear that the lower evaluations given by the students with print disabilities were indicative of their reduced capacity to engage with those courses. It is interesting that this was not reflected in their ratings of general satisfaction: Both the students with print disabilities and the students with no disability reported high levels of satisfaction. The ratings given by the students with print disabilities tended to be lower than those given by the students with no disability (see Table 4), but the difference was both non-significant and small on Cohen's (1988) criteria. This suggests that the students with print disabilities had calibrated their satisfaction ratings to their personal situation.

The RASI proved to be less satisfactory. The internal consistency of certain of the 13 subscales would not be regarded as satisfactory by conventional research-based criteria, and two subscales that supposedly constituted positive indicators of a surface approach were more plausibly construed as negative indicators of a deep approach (see Table 5). However, the instrument as a whole did seem to measure the three distinct approaches to studying that were identified in previous research. Moreover, students who had positive perceptions of their courses were more likely to adopt a deep or a strategic approach and were less likely to adopt a surface approach than were students who had negative perceptions of their courses.

A similar pattern of individual covariation was apparent at the group level in differences between the students with print disabilities and those with no disability. The students with print disabilities not only produced less positive ratings of their courses; they were also more likely to adopt a surface approach than were the students with no disability. This difference occurred on their overall scores on Surface Approach and their scores on three of its constituent subscales concerned with Unrelated Memorizing, Syllabus-Boundness, and Fear of Failure. Even on the fourth subscale (concerned with a lack of purpose), there was a nonsignificant trend in the same direction. The differences between the students with print disabilities and the students with no disability remained significant when the possible effects of demographic variables had been statistically controlled.

The differences between the students with print disabilities and the students with no disability in their scores on Surface Approach and their scores on the subscales concerned with a fear of failure and unrelated memorizing would be characterized as being at least medium effects on Cohen's (1988) criteria. Once again, they are likely to be of both theoretical and practical importance. It would appear, then, that students with print disabilities are more likely to exhibit a surface approach to studying than are students with no disability, insofar as they are more likely to engage in a strategy of rote memorization and to experience pessimism and anxiety about academic outcomes. They are also more likely to exhibit syllabus-boundness, which Ramsden and Entwistle (1981) defined as the students' reliance upon their teachers to define their learning tasks.

Even so, there were no significant differences between the students with print disabilities and the students with no disability in terms of their scores on Deep Approach or Strategic Approach. Thus, the difficulties encountered by the students with print disabilities did not interfere with their capacity to adopt more desirable approaches to studying. Indeed, they obtained higher scores than did the students with no disability on Time Management (see Table 6). This suggests that the students with print disabilities tried to compensate for their difficulties

by adopting a more structured and organized approach to their studies. It should also be noted that both the students with print disabilities and the students with no disability tended to obtain higher scores on the subscales defining a deep approach and a strategic approach than they did on the subscales defining a surface approach. In short, all of the students were likely to adopt desirable rather than undesirable approaches to studying.

There were no differences between the students with print disabilities supported by the ReadOut software and the students with print disabilities supported by audio recordings of the course materials in terms of their scores on either the CEQ or the RASI. The ReadOut software might have been expected to provide a more interactive learning environment than conventional forms of support. Consequently, it should have encouraged students with print disabilities to adopt more active and hence more desirable approaches to studying and to provide more positive evaluations of their courses. Nevertheless, any differences between the students with print disabilities who used the ReadOut software and those who used audio recordings in terms of their scores on the CEQ and the RASI were nonsignificant and small in magnitude. While intriguing, this should not detract from the tremendous advantage of the ReadOut software in terms of its sheer practical convenience.

There were also no significant differences between the students with visual impairment and those with another kind of disability in terms of their scores on the CEQ and the RASI, despite the very different circumstances in which these students approach the task of taking courses in distance education. It was suggested in the introduction that students with print disabilities constitute a heterogeneous population. However, the results of the present investigation suggest that they are a rather homogeneous population based on their experiences of distance learning, not only in terms of their perceptions of the academic quality of their courses but also in terms of the approaches that they adopt to studying those courses.

A methodological point that should be considered is whether the differences between the students with print disabilities and the students with no disability were artifacts due to problems encountered by the former students in completing a printed questionnaire. Although there was no difference in their response rates, it is possible that the students with print disabilities had difficulty using the full range of response alternatives and perhaps tended to confine themselves to the middle of the 5-point scale. Nevertheless, this idea is not supported by the selective nature of the differences that were demonstrated. The students with print disabilities obtained lower scores than did the students with no disability on some of the CEQ scales but not on other scales or on their ratings of general satisfaction. Similarly, the students with print disabilities obtained higher scores than did the students with no disabilities on the Surface Approach scale of the RASI, but the two groups of students did not differ in their scores on the Deep Approach scale or the Strategic Approach scale.

Richardson (1994) argued that a deep approach or an orientation towards the meaning of course materials was consistent across all cultures, reflecting a consensus about the fundamental aims of higher education. However, a surface approach or an orientation towards reproducing course materials was more diverse across cultures and reflected a variety of abilities and attitudes that became salient when practical circumstances (for instance, inappropriate assessment or an overloaded curriculum) served to subvert those aims. The present findings suggest that a surface approach or a reproducing orientation is also likely to be engendered when the aims of higher education (both at the institutional and the personal level) are frustrated by disabilities that make it difficult or impossible for students to make appropriate use of text-based resources.

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