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*Special issue*  
Perceiving and Representing  
the Role of ICTs  
in Learning Processes

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# Attitudes to ICTs and approaches to studying in higher education

John T.E. Richardson\*

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## Abstract

This article reviews the literature on the relationship between students' attitudes to ICTs and the approaches to studying that they adopt on their programmes of study in higher education. There is a consistent finding that students who have more positive attitudes to ICTs are more likely to adopt desirable approaches to studying. This is true of younger and older students, and it is true both in face-to-face education and in distance education. The implication is that in both kinds of setting and whatever their age today's students regard the use of ICTs as an integral part of their experience of higher education.

**Keywords:** age, approaches to studying; attitudes to ICTs; distance education; higher education

## Introduction

Since the 1990s, institutions of higher education around the world have introduced a wide variety of digital technologies. They make

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routine use of learning management systems (virtual learning environments) and web-based applications both to deliver course content and to provide student support. Brown *et al.* (2010) and Hawkins and Rudy (2008) reported results of surveys of the situation in the United Kingdom and the United States, respectively. The adoption of ICTs on the part of institutions has been matched by students themselves. For example, Smith and Caruso (2010, pp. 41-42) found that 98% of undergraduate students in the United States owned their own computers and that 63% also owned an internet-capable handheld device such as an iPhone. Dahlstrom, de Boor, Grunwald, and Vockley (2011, pp. 10-12) found that most students regarded ICTs as being extremely valuable to their academic success. The current situation is broadly similar in the United Kingdom (*Student perspectives on technology*, 2010).

Some writers have claimed that the increased use of ICTs among young people in general means that they represent a distinct population who think and learn in qualitatively different ways from older people. They have been variously called “Millennials” (Strauss & Howe, 1991), the “Net Generation” (Tapscott, 1998), “Digital Natives” (Prensky, 2001a) and “Generation Y” (Jorgensen, 2003). Indeed, some argue that exposure to ICTs has brought about changes in the structure and function of the brains of people born since the early 1980s (Prensky, 2001b; Tapscott, 2009, pp. 97-119). Ideas such as these have potentially important implications for teaching and course design in higher education (see Howe & Strauss, 2003; Prensky, 2010). Nevertheless, they are essentially speculations for which there is little or no direct evidence (for critical evaluations of the Net Generation and Digital Natives hypotheses, see Bennett, Maton, & Kervin, 2008; Jones, 2011; Schulmeister, 2009, 2010; Selwyn, 2009).

Even so, it would not be surprising if young people who have grown up with ICTs make more use of those technologies and have more positive attitudes to those technologies. This is relevant to their attainment in higher education, because there is some evidence that students who have more positive attitudes to ICTs are also more likely to adopt desirable approaches to studying in higher education. In this article, I briefly review this evidence and discuss its implications for our understanding of the student experience in higher education.

## Approaches to studying in higher education

Interview-based research carried out in the 1970s found that individual students in higher education adopted different approaches or orientations towards their academic studies: a deep approach, or an orientation towards understanding the meaning of their course materials; a surface approach, or an orientation towards being able to reproduce the materials for the purposes of assessment; and a strategic approach, or an orientation towards achieving the highest possible marks or grades. The evidence suggested that a student's choice of approach depended on the content, the context and the demands of particular learning tasks (Laurillard, 1979; Marton, 1976; Ramsden, 1979).

A variety of different questionnaires were devised to measure approaches to studying in larger numbers of students (e.g., Biggs 1987; Entwistle & Ramsden 1983; for a review, see Richardson 2000). Surveys using instruments such as these subsequently confirmed that students adopt different approaches to studying on particular courses depending upon their perceptions of the demands of those courses (Eley, 1992), their perceptions of the quality of the teaching (Vermetten, Lodewijks, & Vermunt, 1999) and their perceptions of the nature of the assessment (Scouller, 1998).

## Approaches to studying and attitudes to ICTs

Goodyear, Asensio, Jones, Hodgson, and Steeples (2003) administered questionnaires of this sort to students who were taking courses at four U.K. universities that were delivered by networked learning using computer-mediated conferencing (see also Goodyear, Jones, Asensio, Hodgson, & Steeples, 2005). The survey also included sections about the students' expectations and experiences of using ICTs. A factor analysis of their responses to the section on their expectations yielded four scales:

- Worth: students' expectations of the worth of using technology
- Confidence: students' expectations about their confidence in using technology

- Utility: students' expectations about the future benefits of using technology
- Interest: students' expectations about their interest in using technology

Goodyear *et al.* found that students who expressed more positive attitudes regarding worth, utility and interest were more likely to adopt a deep approach in their studies; that students who expressed more positive attitudes regarding utility were more likely to adopt a strategic approach in their studies; and that students who expressed more positive attitudes regarding worth and confidence were less likely to adopt a surface approach in their studies.

It is generally assumed that a deep approach to studying and a strategic approach to studying are desirable forms of study behaviour, insofar as they conform to the expressed aims of teachers and institutions of higher education; and that a surface approach to studying is an undesirable form of study behaviour, insofar as it conflicts with the expressed aims of teachers and institutions of higher education. The pattern of results obtained by Goodyear *et al.* therefore suggests that students who have more positive attitudes to ICTs are more likely to adopt desirable approaches to studying and are less likely to adopt undesirable approaches to studying than students who have less positive attitudes to ICTs.

Foster and Lin (2007) surveyed students taking Master's programmes in information systems and information management who were supported by a learning management system designed in WebCT. The students' attitudes to the learning management system were positively correlated with aspects of a deep approach to studying and a strategic approach to studying but were not significantly correlated with aspects of a surface approach to studying. In fact, those students who did adopt a surface approach to studying were able to use the learning management system to retrieve lecture notes and other course-related materials and to obtain formative feedback on drafts of their assignments from the course tutors.

Chen, Lambert, and Guidry (2010) analysed data from the National Survey of Student Engagement, which is administered to first-

year and final-year students at colleges across the United States to obtain feedback on their experience of higher education. It includes scales to measure three different aspects of deep learning: higher-order thinking, integrative learning, and reflective learning. In 2008, the institutions involved in the survey could opt to include an additional section concerned with the students' experience of online learning, and this yielded responses from nearly 24,000 students. Chen *et al.* found that ratings of their use of learning technology were positively correlated with their scores on all three aspects of deep learning.

## Age and attitudes to ICTs

The studies that have just been mentioned were concerned mainly with young adults, and the possibility of age-related variations in students' attitudes to ICTs was ignored. Quite apart from the Net Generation and Digital Natives hypotheses, it is possible that younger adults differ in their use of ICTs from older people. This is typically attributed to older people having poor access to ICTs, less motivation to use ICTs and fewer digital skills than younger people (e.g., Peacock & Künemund, 2007; Wagner, Hassanein, & Head, 2010). This "digital divide" is likely to be moderated by gender, class, ethnicity and other characteristics (e.g., Goode, 2010; Graham, 2011; Shieh, Chang, & Liu, 2011). However, in the context of higher education, age differences have been the primary concern.

These were examined in a study by Jones, Ramanau, Cross, and Healing (2010; see also Jones & Hosein, 2010). In 2008, they had surveyed first-year undergraduate students at five English universities on their use of ICTs and their attitudes to ICTs. There were age-related differences in technology use: for instance, younger students were more likely to use laptop computers or handheld devices but older students were more likely to use desktop computers; younger students were also more likely to use newer forms of technology such as wikis, blogs or virtual worlds. Moreover, there were age-related differences in attitudes to ICTs: generally speaking, older students reported less confidence in their use of digital tools. Nevertheless, neither the older students nor the younger students constituted a homogeneous group

in their use of ICTs, and there was no evidence for any discontinuity around the age of 30, as would be predicted by the Net Generation and Digital Natives hypotheses.

## **Age, attitudes to ICTs and approaches to studying**

One basic problem with this study was that nearly all of the older students were taking courses by distance learning with the U.K. Open University, whereas most of the younger students were at campus-based institutions. Consequently, variations in age were confounded with difference in the mode of course delivery. This was addressed in a survey by Jelfs and Richardson (in press), who surveyed a large sample of students taking courses with the Open University, stratified into successive decades of the adult life span. Responses were obtained from 4,066 students aged between 21 and 92, representing a response rate of 58.1%. The survey questionnaire covered both their attitudes to ICTs and their approaches to studying: their use of a deep approach, their use of a surface approach, and their use of two aspects of a strategic approach, monitoring studying and organised studying.

Consistent with the findings of Jones *et al.* (2010), Jelfs and Richardson found that the students in the older age groups were more likely than the students in the younger age groups to have access to a desktop computer, but that the students in the younger age groups were more likely than the students in the older age groups to have access to a variety of other ICTs. Most of the students had mobile phones, and the students in the older age groups were as likely as the students in the younger age groups to use them for making and receiving calls; however, the students in the older age groups were less likely than the students in the younger age groups to use them for other purposes such as making or receiving text messages, using them as a camera or a music player, or using them for internet access or to use WiFi. The students in the younger age groups also spent more time per week using ICTs both for study and for other purposes than did the students in the older age groups.

Jelfs and Richardson used a six-item scale to measure students' attitudes to ICT:

- I have access to all the ICT necessary to study with the OU [Open University].
- I am not clear about how the use of ICT can improve my learning.\*
- I enjoy using ICT in my studies.
- I think the importance of using ICT in education is overstated.\*
- I am excited by the use of ICT at the OU.
- I am reluctant to use ICT in my OU studies.\*

The respondents indicated their agreement or disagreement with each item on a scale from “totally agree” (scored 5) to “totally disagree” (scored 1). The scale score was the mean of the responses to the six items after the negatively worded items (shown with asterisks) were coded in reverse (so that 5 was coded as 1 and vice versa). The students in the younger age groups had rather more positive attitudes to ICTs than the students in the older age groups. However, in each age group the mean score was above the midpoint of the response scale (3), indicating broadly positive attitudes to ICTs. Also consistent with the findings of Jones *et al.* (2010), there was no evidence for any discontinuity in ICT use or in attitudes to ICTs around the age of 30, as would be predicted by the Net Generation and Digital Natives hypotheses.

Previous research had found that older adults were more likely to adopt a deep approach and less likely to adopt a surface approach than were younger students (see Baeten, Kyndt, Struyven, & Dochy, 2010, for a review). The most commonly suggested explanation for this pattern is that older students are more likely than younger students to be studying out of intrinsic interest or for their own personal development (see, e.g., Gow & Kember, 1990; Richardson, 1994; Watkins, 1982). Consistent with this broad pattern, Jelfs and Richardson (in press) found that the students in the older age groups obtained higher scores on deep approach, monitoring studying and organised studying than the students in the younger age groups, but the students in the older age groups obtained lower scores on surface approach than did the students in the younger age groups. This pattern remained the case even when the effects of variations in the students’ attitudes to ICTs had been statistically controlled.

Conversely, and consistent with the findings of Goodyear *et al.* (2003, 2005), Foster and Lin (2007) and Chen *et al.* (2010), the students who had more positive attitudes to ICTs obtained higher scores on deep approach, monitoring studying and organised studying, and they obtained lower scores on surface approach than did the students who had less positive attitudes. This pattern remained the case even when the effects of variations in the students' ages had been statistically controlled. Jelfs and Richardson concluded that students' age and their attitudes to ICTs were distinct predictors of approaches to studying in higher education.

## Conclusions

We now have a fairly clear picture concerning the interrelationships between age, attitudes to ICTs and approaches to studying among students in higher education. First, younger adults tend to have access to a wider range of technologies than older adults, and they tend to have more positive attitudes to those technologies than do older adults. Nevertheless, these are all monotonic trends across the adult life span, and there is no evidence for any discontinuity around the age of 30, as would be predicted by the Net Generation and Digital Natives hypotheses. Indeed, provided that they have access to relevant forms of technology, students in all age groups express broadly positive attitudes to the use of ICTs in their courses. As Jelfs and Richardson (in press) noted, researchers, practitioners and policy-makers need to avoid accepting lazy stereotypes about the capabilities of older people.

Another lazy stereotype which is sometimes encountered is that the experience of older students in higher education is inherently problematic (see Richardson & King 1998). On the contrary, the research evidence shows that older students are more likely to adopt desirable approaches to studying and are less likely to adopt undesirable approaches to studying than are younger students. They also tend to show better attainment than younger students (Richardson & Woodley, 2003). It follows that institutions of higher education should have few qualms about recruiting older students in significant

numbers, even while there is continuing demand for higher education among young adults.

As a separate phenomenon, students who have more positive attitudes to ICTs are more likely to adopt desirable approaches to studying and are less likely to adopt undesirable approaches to studying than are students who have less positive attitudes to ICTs. Research has shown that this pattern is true in both younger and older students, and that it is true both in campus-based, face-to-face settings and also in distance education. Jelfs and Richardson concluded that, in both kinds of setting and whatever their age, today's students regard the use of ICTs as an integral part of their experience of higher education. Those responsible for evaluating and enhancing the quality of that experience need to ensure that proper attention is paid to the contribution of ICTs to higher education. Nevertheless, the use of ICTs needs to be carefully integrated into the curriculum through appropriate pedagogy and assessment if it is to be of genuine benefit to students (Kirkwood & Price, 2005).

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