Learning Preferences and Readiness for Online Learning

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Using a sample of 314 Australian university students the Readiness for Online Learning questionnaire was tested for its technical characteristics of reliability and factorability, with results indicating the instrument has promise both for research and for practice. The factor analysis identified a factor associated with self-management of learning, and one of comfort with e-learning. These factors are interpreted and discussed within a framework of the broader literature on learning preferences associated with flexible delivery and resource-based learning.

Assessing student readiness for online learning is an issue facing many education and training providers as more learning opportunities are made available online in varying formats. While readiness for online learning clearly involves the technical skills of computer usage and site navigation, there are also issues associated with how students learn online, and the learner styles, preferences, and strategies that may be related to effective student engagement with online learning. In developing readiness for online learning, a number of writers (for example, Alexander, Polyakova-Norwood, Johnston, Christensen, & Loquist, 2003) have paid attention to the hardware and software technical skills required both of teachers and learners, as well as to the dispositional skills of attitude to online engagement and communication. Similarly, Barker (2002) has recognised the technical skills required as well as the skills of interaction.

Placed in Billett's (1993) framework of workplace knowledge, there is procedural knowledge about how to use the software and hardware involved; propositional knowledge about what the technical systems can do and how they work; and there are dispositional variables related to motivations to use these systems, and the styles or preferences for learning that users may exhibit. The current paper will focus on the dispositional variables that influence online learning engagement.

There is confusion in the literature over what is meant by 'online'. Indeed, it is not always made clear what is actually being referred to when the term 'online' is applied.

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to education and training. At one end of a spectrum it can mean that learning materials are available to learners electronically for them to read on screen or download, but without any communication between instructor and learner. At a similarly basic level it can mean merely the occasional exchange of emails between learner and instructor, with no other learning resources or experiences provided in electronic form. At a much more sophisticated level it can mean that learning resources are available electronically, and supported by a groupware system where learners can interact together and interact with their instructor.

In the current paper my focus is on that last form of online learning, where learners access at least part of the required learning resources from an electronic source, and where they participate in discussion using a groupware system of computer-mediated communication (CMC). The conceptualisation of CMC used here is that discussed by Stacey (1998) and characterised by groupware systems (such as First Class) that enable learners to interact collaboratively with other learners, with their instructors, and with other experts who may be external to the teaching–learning environment. The interaction may be synchronous or asynchronous.

**Collaborative Learning and Discussion**

There are a number of reasons for one of the focuses of this paper being on student interaction in online learning. For example, there is considerable evidence in the literature (Harasim, Hiltz, Teles, & Turoff, 1995; McKavanagh, Kanes, Beven, Cunningham, & Choy, 2002) that “active participation, encouraged by the atmosphere and course design and in other ways, is central to a successful online course” (Harasim et al., 1995, p.177).

The importance to learning of the opportunity to participate in a social construction of knowledge has been researched by cognitive psychologists such as Piaget, Vygotsky, and Bruner, who emphasised the social nature of learning, particularly when learners are confronted with problems which they cannot solve on their own without the resources of a group. More importantly, the process of discussion, listening to other group members and receiving feedback on ideas, provides the cognitive scaffolding these constructivists see as essential to higher-order thinking (Slavin, 1994). The development of knowledge and understanding within conceptual frameworks, it is argued by the constructivists (von Glasersfeld, 1987), is an ongoing interpretive process, which is reinforced by past and ongoing experiences. Individuals collaboratively construct a common grounding of beliefs, meaning, and understandings that they share in activity (Pea, 1993) through a community of learning or practice (Lave & Wenger, 1991). As Stacey (1996, 1998) has argued, these constructions depend largely on a socio-cultural and communicative context for their development.

Stacey’s (1996, 1998) research with university level learners online found that a socially constructed learning environment is essential for effective learning. The social conversation provides the learner with a context and stimulus for thought
construction and learning, which is the means by which the group contributes more to each learner’s understanding than they are able to do individually. Finally, Rainbow and Sadler-Smith (2002), in their research with business students in the UK, also observed that to be effective computer aided learning needs to be integrated with opportunities for dialogue. Accordingly, it is argued here that a willingness to engage collaboratively with other learners online is an important characteristic of learners if they are to be successful within an online environment.

Self-Management of Learning

There has been research in online learning focussed on learner willingness to be self-directed and to take control and self-manage their learning. For example, Wang and Newlin (2000), working with undergraduate students in a course on psychological statistics, showed that success among their students in a virtual classroom was predicted by “intellectual inquisitiveness, and an internal locus of control” (p.142). Research by Valenta, Therriault, Dieter, and Mrtek (2001), using the Canfield Learning Styles Inventory (Canfield, 1988), has also identified a strong independent learning factor as a possible predictor of success with technology-mediated distance education. Other work, among vocational training students (Warner, Christie, & Choy, 1998), indicates that a capacity for self-directed learning and an ability to work with textually presented materials are important characteristics among learners who engage successfully with online learning, including computer-mediated communication (CMC).

These findings regarding the importance of self-management to effective online learning engagement are consistent with the broader literature on resource-based learning, distance education, and flexible delivery. Evans and Smith (1999) have observed that, although there are different conceptualisations of these terms, each includes the notion of independence and self-directedness in learning. Boote (1998) and Smith (2000) have also concluded from research findings that the skills of self-directed learning are necessary for effective engagement with flexible delivery and resource-based learning, while Evans (2000) has asserted that for distance education and flexible delivery to be effective, self-direction on the part of learners is a necessary condition. Finally, Kember’s (1995) two-dimensional model of open learning argues that success is dependent upon learners moving to a more independent, self-directed style of learning.

Measuring Learner Preferences Towards Online Learning

The suggestion here is, then, that willingness to engage with others through electronic communication and a preference towards self-managed learning represent at least two important learner dispositional characteristics that may predict success with collaborative online learning.

This suggestion that important student online learning preference characteristics include a willingness to participate in collaborative learning, and a preference
towards self-managed learning, is consistent with other work on students' learning preferences as they relate to flexible delivery and distance education. Previous research by Smith (2001), using the Canfield Learning Styles Inventory with university students, has shown a similar two underlying dimensions of preference. One of these was associated with the degree of comfort students had with the learning tasks presented to them (verbal–nonverbal; collaborative), while the second dimension was associated with self-directedness.

McVay (2000, 2001) has developed a Readiness for Online Learning questionnaire which focuses on student behaviour and attitudes as predictors of online learning readiness. The questionnaire shows promise because it is provided some validity through McVay's own research, and Smith, Murphy, and Mahoney (2003) have shown the instrument to have promising reliability characteristics, although they proposed some adjustments to the instrument to enhance reliability. The Smith et al. study was exploratory only, and the data set comprised 107 undergraduate students, with around equal numbers from the US and from Australia, and spread throughout a number of disciplines. Smith et al. were able to identify a factor structure for the instrument that is readily interpretable, and that showed a factor describing self-management of learning, and a second factor that was described as "comfort with e-learning".

The "self management of learning" factor identified with the McVay instrument in an e-learning context was clearly similar to the "self-directed/dependent" factor identified in the earlier Smith (2001) study with the Canfield Learning Styles Inventory. The second factor, comfort with e-learning, included a number of questions in the instrument that dealt with willingness to engage with others through electronic means, and comfort with accessing learning resources from electronic sources such as the Internet. That second factor is similar to the verbal–nonverbal/collaborative factor identified in earlier research by Smith, and interpreted as comfort with the learning tasks presented. It seemed then that the McVay instrument factor structure also had the attraction of being interpretable within an existing body of similar research and theory, but within the more specialised context of e-learning. Differentiation between students in an e-learning environment, it could be argued, may be rather similar to the differentiation among their preferences in a broader and more traditional resource-based learning environment.

The current study has been designed to test further, with a larger sample of Australian university students only, the value of McVay's (2000, 2001) instrument as a potentially useful tool for assessing student readiness for online learning that involves learning at a distance from the instructor, and learning in a collaborative environment. It was acknowledged by Smith et al. (2003) that the matrix on which they had conducted their exploratory study of the McVay questionnaire was rather small at 107 participants, and needed to be repeated. There is also a case for testing the reliability of the items again with a larger number of participants, all drawn from the same nation.
Table 1. Distribution of students by program area

<table>
<thead>
<tr>
<th>Program area</th>
<th>Number of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business</td>
<td>34</td>
</tr>
<tr>
<td>Arts/social science/law</td>
<td>73</td>
</tr>
<tr>
<td>Education</td>
<td>69</td>
</tr>
<tr>
<td>Nursing/health sciences/science</td>
<td>138</td>
</tr>
</tbody>
</table>

**Method**

McVay's (2000, 2001) Readiness for Online Learning questionnaire was administered to 314 Australian undergraduate university students at the same university. All students were studying on campus on a full time or part time basis. The sample of students was chosen across a selection of program areas in order to overcome any specific course effects, and to control for some varying experiences with online learning in the different programs offered at the university. The 62 Australian university students included in the Smith et al. (2003) study were also included in the data set of the current study. Table 1 shows the distribution of students across the program areas. The age range of the students was from 18 to 54 years with 90% of the sample being 25 years or younger. The mean age was 21.4 years with a standard deviation of 5.3.

The questionnaire was administered during class time and students were instructed to answer the questionnaire in a context of their university study. The questionnaire is answered by respondents choosing, along a four-point Likert scale, their level of agreement with 13 statements, where 1 represents a low level of agreement, and 4 a high level. These statements are shown in Table 2.

**Results**

**Reliability Analysis**

The reliability of the questionnaire is satisfactory, with a Cronbach alpha of 0.79. Both Coakes and Steed (1997) and Pallant (2001) suggest alpha values above 0.7 are sufficient for reliability to be assumed. No items showed a corrected item-total correlation of less than 0.3, and no item showed an alpha if deleted score less than the Cronbach. These are the criteria suggested by Pallant as necessary for retention of an item in a questionnaire.

**Factorability of the Matrix**

Coakes and Steed (1997) suggest a minimum of five subjects per variable, which has been achieved in this study. As also suggested by Coakes and Steed, factorability was established through an inspection of the correlation matrix, and through conducting
the Kaiser-Meyer-Olkin measure of sampling adequacy and Bartlett's test of sphericity.

A sizeable number (51) of the correlations in the matrix were significant at the 0.05 level. The KMO test yielded a measure of 0.78, and Coakes and Steed recommend that this measure should exceed 0.6 to proceed with factoring. Bartlett's test of sphericity was significant well beyond the 0.001 level. Accordingly, having established the factorability of the matrix, the factor analysis proceeded.

**Factor Analysis**

As this was an exploratory study several analyses were conducted to establish the one that yielded the most satisfactory results for interpretation. Each was a principal components analysis with varimax rotation. A factor loading criterion of 0.40 was adopted for inclusion of an item in the interpretation, more stringent than Tabachnik and Fidell (1996), who suggest 0.32, and consistent with Comrey and Lee (1992) who suggest the criterion should be set a little higher than 0.32. Additionally, where an item loaded on more than one factor, following the advice of Arrindell, Emmelkamp, Brilman, and Monsma (1983), the item was included in the factor on which it scored highest, provided the difference between the two-factor loadings was at least 0.2. The first analysis, after varimax rotation, indicated three factors with eigenvalues greater than one. That solution accounted for 50.7% of the variance; however, applying Cattell's (1966) scree test indicated that a two-factor solution was the most satisfactory. The two-factor solution was chosen since it provided a clear interpretation, and accounted for 42.2% of the variance, and was consistent with the previous study conducted by Smith et al. (2003). That solution is shown below in Table 2.

**Factor Interpretation**

Items 4, 8, 9, 10, 11, 12, and 13 loaded highly and distinctively on Factor 1, which has been interpreted as “self-management of learning”, similarly to Smith et al. (2003). The factor may possibly also be interpreted as “self-directed learning”. Items 1, 2, 3, and 5 loaded highly on Factor 2, and that factor has been interpreted as “comfort with e-learning”, again the same as in Smith et al.

**Discussion and Conclusions**

The current study has established a factor structure for the McVay (2000, 2001) Readiness for Online Learning questions that is very similar to that established by Smith et al. (2003). Although the two studies have shown some differences in the questions that load on each of the factors, these are relatively minor and make no difference to the interpretation of the two factors. Specifically, Questions 4 and 12 loaded distinctively on the self-management factor in the current study, but did not do so in the Smith et al. (2003) study. For the “comfort with e-learning” factor the
Table 2. Questionnaire items and factor loadings

<table>
<thead>
<tr>
<th>Factor</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eigenvalue</td>
<td>3.21</td>
<td>2.28</td>
</tr>
<tr>
<td>% of variance</td>
<td>24.71</td>
<td>17.53</td>
</tr>
<tr>
<td>Questionnaire item</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. I am able to easily access the Internet as needed for my studies.</td>
<td>.03</td>
<td>.62</td>
</tr>
<tr>
<td>2. I am comfortable communicating electronically.</td>
<td>.02</td>
<td>.87</td>
</tr>
<tr>
<td>3. I am willing to actively communicate with my classmates and instructors electronically.</td>
<td>.09</td>
<td>.78</td>
</tr>
<tr>
<td>4. I am willing to dedicate 8 to 10 hours per week for my studies.</td>
<td>.52</td>
<td>.16</td>
</tr>
<tr>
<td>5. I feel that online learning is of at least equal quality to traditional classroom learning.</td>
<td>.07</td>
<td>.56</td>
</tr>
<tr>
<td>6. I feel that my background and experience will be beneficial to my studies.</td>
<td>.38</td>
<td>.33</td>
</tr>
<tr>
<td>7. I am comfortable with written communication.</td>
<td>.36</td>
<td>.25</td>
</tr>
<tr>
<td>8. When it comes to learning and studying, I am a self-directed person.</td>
<td>.75</td>
<td>.00</td>
</tr>
<tr>
<td>9. I believe looking back on what I have learned in a course will help me to remember it better.</td>
<td>.42</td>
<td>.13</td>
</tr>
<tr>
<td>10. In my studies, I am self-disciplined and find it easy to set aside reading and homework time.</td>
<td>.78</td>
<td>−.02</td>
</tr>
<tr>
<td>11. I am able to manage my study time effectively and easily complete assignments on time.</td>
<td>.68</td>
<td>.09</td>
</tr>
<tr>
<td>12. As a student, I enjoy working independently.</td>
<td>.52</td>
<td>−.03</td>
</tr>
<tr>
<td>13. In my studies, I set goals and have a high degree of initiative.</td>
<td>.75</td>
<td>.02</td>
</tr>
</tbody>
</table>
questions that loaded distinctively were the same in both studies. It needs to be recalled here that the 62 Australian students in the Smith et al. sample were also included in the data set of the current investigation of 314 Australian students.

Besides sample size, there were some major differences between the sample in the current study and the sample in the Smith et al. (2003) study, and these differences are most likely to explain the slightly different loading patterns. First, the original study was undertaken both with US and Australian students, whereas the current study included only Australians. Differences between US students and Australian students may be present, but that analysis has yet to be undertaken. More importantly, though, the sample in the current study comprised a larger proportion of older students, whereas the Smith et al. study sample was of almost entirely younger students between 18 and 24 years of age.

As argued by Smith et al. (2003), the “comfort with e-learning” factor is recognisable as an e-learning-focussed dimension not unlike the verbal–nonverbal/collaborative dimension identified by Smith (2001) in his work with Australian university students in a broader context of resource-based flexible learning materials. The McVay questionnaire describes a readiness for engagement with the particular form of resource-based learning delivery that is online, and that includes accessing learning materials through the Internet, as well as collaborating with a group online. As discussed earlier in this paper, there is considerable evidence (Harasim et al., 1995; McKavanagh et al., 2002; Stacey, 1996, 1998) that willingness to participate in online discussion groups is crucial to the effectiveness of online learning in contexts that require students to construct meaning and understandings.

Similarly, the identification of a “self-management of learning” factor in the McVay instrument is clearly also evident in the broader research by Smith (2000). Indeed, the need for self-direction, or self-management of learning, runs clearly throughout the distance education and resource-based flexible learning literature. Several writers (Boote, 1998; Evans, 2000; Warner et al., 1998) have commented that self-direction is a necessary pre-requisite for effective resource-based learning in distance education and flexible delivery.

The identification through the readiness questionnaire of these two factors with congruence in the broader resource-based distance education and flexible delivery indicates that the instrument is measuring learner preferences that have been identified in broader studies designed to investigate preferences or styles.

The McVay (2000, 2001) instrument has shown very adequate reliability for the Australian sample, although there is scope for adjustment and re-testing of some items, as proposed by Smith et al. (2003). Additionally, the factor structure appears to be fairly robust, with the same factors being identified in the two studies conducted on the questionnaire. As a consequence, the McVay Readiness for Online Learning questionnaire may have useful applicability to research and practice in the area of student dispositions and preferences associated with online learning.

There is need for much more work on the validity of the instrument, in order to establish its value as a predictor of online learning success, but the current research, together with that of McVay (2000) and Smith et al. (2003), indicates that the
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An instrument has sufficient merit to justify the further research that is required. There is also scope for further development of the questionnaire to review and rework those questions that failed to provide a distinctive loading on either identified factor. In the current research, those questions have not contributed distinctively to the measurement of either of the factors. Addressing and reworking those questions to provide better distinctiveness would also serve to increase the amount of variance that is explained by the two-factor structure.

An additional attraction of the McVay instrument is its brevity, rendering it quick and easy to administer in a context of practice, but also providing scope for the addition of other questions that may further enhance the value of the questionnaire.

Acknowledgement

The Readiness for Online Learning survey is taken from How to be a successful distance learning student: Learning on the Internet written by Marguerita McVay (2001), and used in this study with the kind permission of the author.

References


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