Academics' views on Personalised e-Learning in Higher Education

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Abstract

The challenges for academics in meeting the learning requirements of students are many and varied. This research focuses on the concept of personalised learning, where activities are specifically selected to suit the learning requirements of individual students. The creation of personalised learning activities to suit every student's learning needs, are not easily achieved. A survey was conducted in June 2012 to determine academics awareness of, and views on, the 'novel teaching approach' of personalised e-learning in higher education. Forty academics participated in this study. 60% of academic respondents agreed with the statement: "There is a need to personalise e-learning to suit individual student's learning requirements". 85% of respondents agreed that e-learning can enhance the learning experience of students, and 70% were of the opinion that the use of personalised e-learning activities would enhance the learning experience of students. 43% of respondents agreed that they would use an authoring tool for personalising e-learning if one was available, and 43% did not know if they would use one or not. 'Prior knowledge' was perceived as the most important student characteristic on which to base personalisation and the easiest to achieve, and 'web navigational behaviour' was seen as the least important and most difficult to achieve. This study contributes to existing research into the development of authoring tools to facilitate the creation of personalised e-learning activities by non-technical authors.

Keywords

Academics, Lecturers, Educators, Instructional Designers, Students, E-learning, Personalisation, Personalised e-learning, Personalised learning activities, Adaptive e-learning, Technology enhanced learning, and Higher education.

1. Introduction and Motivation

"The use of technology in higher education has certainly made information more readily available to students" (O'Donnell, 2012, p. 925). But, easy access to an abundance of information could lead to information overload. Perhaps, there is a case to be made for the use of personalised e-learning in higher education, to guide students through the abundance of available information. Personalisation has gained significant attention from: Technology vendors (Google; Microsoft); Commercial sites (Amazon; eBay; Schafer, Konstan, & Riedl, 2001); and e-Learning vendors (HMH; Pearson).

This research focuses on the divide between the concept and realisation of personalised e-learning. Several systems which were developed to achieve adaptive content were reviewed, some examples are provided below:

- AHAM updated to AHA! ten years later (Knutov, De Bra, & Pechenizkiy, 2009)
- GRAPPLE Adaptive Learning Environment (GALE) adaptation engine is a follow-up of the AHA! adaptation engine (Foss & Cristea, 2009).
- ACCT authoring tool was designed to enable authors to represent their pedagogical strategies as a series of high-level descriptive concepts (Dagger, 2006).
- MOT – Is a collection of authoring tools for creating adaptive hypermedia learning resources (Foss & Cristea, 2009).
- CopperCore Service Integration (CCSI) – A learning design authoring tool (Vogten et al., 2007).

"Several successful applications and application frameworks (of personalised e-learning) exist, but mass employment ... is still lacking. We believe that authoring difficulties are the main problem that remains" (De Bra, Aroyo, & Cristea, 2004, p. 24).

This research was undertaken to establish potential academic authors' awareness of and reflection on the use of personalised e-learning to embrace learner diversity (Harrigan, Kravcik, Steiner, & Wade, 2009), in higher education. Academics can

enhance their pedagogical approach (Fetherston, 2001), in the same way as students can augment their learning through discussions (Conole, 2010), and connectedness (Swanson, 2010), with peers. Pedagogy is not a procedure to be followed but a problem solving exercise (Alvino, Asensio-Perez, Dimitriadis, & Hernandez-Leo, 2009). "Improving the quality of the student learning experience is a key issue in the higher education sector" (Dermo, 2009, p. 203). Is personalised e-learning a worthy 'novel teaching approach' to add to the discussion on improving the learning experiences of students in higher education?

The background to this research stems from research undertaken as part of the GRAPPLE project. GRAPPLE was an EU FP7 funded Specific Targeted Research Project (STREP). GRAPPLE stands for: "Generic Responsive Adaptive Personalized Learning Environment". "The GRAPPLE project aims at delivering to learners a technology-enhanced learning (TEL) environment that guides them through a life-long learning experience, automatically adapting to personal preferences, prior knowledge, skills and competences, learning goals and the personal or social context in which the learning takes place" (GRAPPLE, 2008).

Some of the issues with personalised e-learning authoring tools are: pedagogical considerations (Conlan, 2004); pedagogical merits (Harrigan et al., 2009); and complexity of design (Dagger, Wade, & Conlan, 2005; Glahn, Steiner, De Bra, Docq, & O'Donnell, 2010; Glahn et al., 2011; Steiner et al., 2010; Vassileva, Bontchev, Chavkova, & Mitev, 2009). "There is also a potential conflict between a learner's preferred learning style and an optimal learning strategy. It appears to be a delicate trade-off between pleasing the learner and doing what's best for them from a pedagogical standpoint" (Harrigan et al., 2009, p. 460). Every academic who engages with teaching will have to develop their own unique approach to pleasing the learner in a pedagogically sound learning environment, be it a traditional, e-learning, or a personalised e-learning environment.

The motivation for this research is to gather potential academic authors' opinions on the concept of personalised e-learning in higher education. "Understanding a user's needs is quite important to satisfy the user" (K. Kim, 2011, p. 279). Therefore, it is

important to gather information from academics on their perceived needs from educational technologies to provide suitable learning environments to engage students. Understanding the needs of academics and students, and how these needs can be met through the use of personalised e-learning environments, is paramount to the future development and implementation of personalised/adaptive systems.

Understanding students' needs is necessary to guarantee their satisfaction with their third level educational experience. Research undertaken by O'Donnell and Sharp (2012), in which three hundred and twenty students participated found "more than 80% of students agreed the use of technology effectively enhances the learning experience and increases satisfaction with their course of study" (O'Donnell & Sharp, 2012, p. 219). In addition, "over 75% agreed that technology improved student engagement with course material" (O'Donnell & Sharp, 2011, p. 10). Could personalised e-learning further increase student satisfaction and engagement?

Some authoring tools for personalisation are intended for use by non-technical academic authors, but are not yet freely available online. When these tools become available, academic authors should receive adequate training, to ensure they can achieve effective use of these tools, which will enable them to create personalised learning experiences and realise efficient re-use of learning resources (Griffiths, Beauvoir, Liber, & Barrett-Baxendale, 2009; Pange & Lekka, 2012). At present the opportunity to investigate the effects of personalised e-learning on the students learning experience is unrealisable because authoring tools for use by non-technical authors are still not freely available online. Dagger, O'Connor, Lawless, Walsh, & Wade (2007), warn "without a critical mass of such services, we risk hindering the evolution of next generation LMSs" (Dagger et al., 2007, p. 34). In 2005 Armani (2005) wrote "Adaptive technologies in the field of education have proven so far their effectiveness only in small lab experiments, thus they are still waiting for being presented to the large community of educators" (Armani, 2005, p. 36). Seven years later, Pange and Lekka (2012) concluded that "the two key aspects of e-learning, reusability of learning objects and learner personalization, are not actualized in practice" (Pange & Lekka, 2012, p. 242).

A ‘user model’ or ‘user profile’ (Bajraktarevic, Hall, & Fullick, 2003; Dagger, Wade, & Conlan, 2004; Eirinaki & Vazirgiannis, 2003; Klobučar & Najjar, 2010; Knutov et al., 2009), is necessary to store information on individual students, this information is then used to inform the adaptation process to facilitate personalisation (Brusilovsky, 2001; Brusilovsky & Millan, 2007; Paireekreng & Wong, 2010). User models should be portable between computers with different configurations (Nikoukaran, Hlupic, & Paul, 1998). For example, GUMF is used to store information on learners engaging with “GRAPPLE-based courses (even at different institutes, using a different LMS)” (De Bra et al., 2012). This level of portability over various computer platforms, and interoperability between software applications, is necessary for personalised e-learning to be effectively realised. “What information should be collected about individual students’ characteristics/traits?”, and: “How these individual differences should be measured to provide appropriate data to populate user models?”, are but two of the questions to be answered by academics before effective use can be made of personalisation in educational environments.

Copyright and piracy concerns prevail in the use of e-books and are partly responsible for their slow uptake (Nelson, 2008). Yet, recent advances in e-textbooks have come some way in practically actualising students personalised learning experiences, by affording students the opportunity to personalise their own learning experience through a range of interactive learning choices (Doering, Pereira, & Kuechler, 2012). Information and Communications Technology (ICT), can facilitate active learning to suit the individual learning requirements of students (Jung & Latchem, 2011), and improve retention and understanding (Felder & Soloman, 2009). Personalised e-learning may afford students the opportunity to engage in active learning, “active learning involves students in doing things and reflective thinking about the things they are doing” (Matveev & Milter, 2010, p. 201). “Interactive episodes provide the learner with an opportunity to build knowledge by actively engaging with the instructor feedback” (Chica, Ahmad, Sumner, Martin, & Butcher, 2008, p. 5). Students respond differently to feedback and scaffolds depending on their level of ‘prior knowledge’ (Bulu & Pedersen, 2012; McLaren, DeLeeuw, & Mayer, 2011). Some of the issues which academics must consider before attempting to realise

personalised e-learning, and gain pedagogic merits from their use, are: copyright and piracy concerns; instructor feedback; and the scaffolds used in supporting students.

This research aims to establish academics opinions and reflections on the following concepts: e-learning; personalised e-learning; the student characteristics on which to base personalisation; interest in using proposed authoring tools; and trust in decision making algorithms. Definition of e-learning: "Learning conducted via electronic media, typically on the Internet*"* (Oxford, 2012), and definition of personalise: *"*Design or produce (something) to meet someone's individual requirements)" (Oxford, 2012). E-learning, alternatively known as technology enhanced learning (TEL), facilitates students' access to electronic learning resources, the 'one size fits all' approach. Personalised e-learning means tailoring learning experiences to suit individual students needs. Adaptive hypermedia aims at providing users with content suitable to their specific requirements, as an alternative to the 'one size fits all' traditional approach (Brusilovsky, 2007; Hauger & Köck, 2007).

2. Procedure for this research

This research encouraged academics to reflect on their teaching approaches, and draw from their teaching experience opinions specifically related to the concept of personalised e-learning. The student characteristics used in this research are: 'prior knowledge'; 'learning preferences'; 'cognitive ability'; and 'web navigational behaviour'. The reasons these characteristics were chosen is explained below:

"Generally, most personalised systems consider learner preferences, interests, and browsing behaviours in providing personalised services" (Chen, Lee, & Chen, 2005, p. 237). 'Learning preferences' and 'web navigational behaviour' were selected for consideration in this research because most personalised systems consider these student characteristics in providing personalised services. Chen et al. (2005) suggest learner ability and cognitive overload are the main research issues to be addressed in personalised e-learning systems, therefore 'cognitive ability' was included as one of the student characteristics for academics to consider. In addition, the findings of Sah (2009), indicate 'prior knowledge' is the most commonly used characteristic in

determining personalisation in adaptive hypermedia (AH), and Donovan and Bransford (2005) suggest 'prior knowledge' can influence future understanding. Therefore 'prior knowledge' was selected as a student characteristic. 'Prior knowledge' refers to conceptual knowledge, competencies, and skills (Sah, 2009). Numerous other students characteristics could have been used in this research and the academics who participated in this research proposed other characteristics worthy of consideration in future research.

The questions used in the questionnaire were devised to encourage academics to think about personalised e-learning, how the personalisation of learning activities could be achieved, the student characteristics/traits which could be used to achieve personalisation, the uses to which personalisation could be put to improve the learning experience of students, and so forth. The academics were encouraged to elaborate on their responses (yes, no, don't know) with qualitative feedback to inform the research of the pedagogic rationale supporting the feedback they provided on each of the questions posed. For more information on this survey please refer to Appendix I. Research ethical clearance was granted from Trinity College Dublin, and the Dublin Institute of Technology, Ireland.

Academics in attendance at the National Academy's 6th Annual Conference and the 4th Biennial Threshold Concepts Conference (Higgs, 2012), the Dublin eLearning Summer School (LTTC, 2012), and academics from the School of Computer Science and Statistics, Trinity College Dublin, and the College of Business, Dublin Institute of Technology were invited to participate. The participants were requested to read the Information Sheet, consent to participate, and complete the twenty questions on the paper based questionnaire. Forty academics consented to take part in this study. Individual responses were aggregated anonymously and the research findings are reported in section three of this paper.

3. Findings

Academics responses to questions:	Yes	No	Don't know
Do you use e-learning?	34	5	
Do you think e-learning can enhance students' learning experience?	34	0	5
Is there a need to personalise e-learning to suit individual student's learning requirements?	24	4	9
Would you develop personalisation based on any other student characteristic?	16	2	17
If an authoring tool for personalising e-learning activities was available would you use it?	17	2	17
Would the use of personalised e-learning activities enhance students' learning experience?	28	0	11
Is there a need for personalised e-learning activities?	23	1	14
Would you trust the decision making algorithms in an authoring tool to determine the most suitable learning activities for each individual student?	4	9	20
Are multiple choice tests suitable for use as components of continuous assessments or examinations for students in Higher Education?	23	10	6
Would the results achieved from multiple choice tests be sufficiently rigorous to base a decision on which personalised e-learning activities are selected for each individual student?	6	17	10
Would the use of personalised e-learning activities assist students in achieving the threshold concepts or basic units of understanding required in their course of study?	22	4	13
Personalised e-learning activities would assist individual students in achieving their full potential.	17	4	18

Table 3.1 - Academics responses to questions

Table 3.1 provides the breakdown of responses to the questions listed.

Some missing values exist in this dataset, because respondents were given the following information in the questionnaire: "Each question is optional. Feel free to omit a response to any question". Where respondents omitted to respond to any question, only the actual responses received were used in the analyses of this data to determine findings.

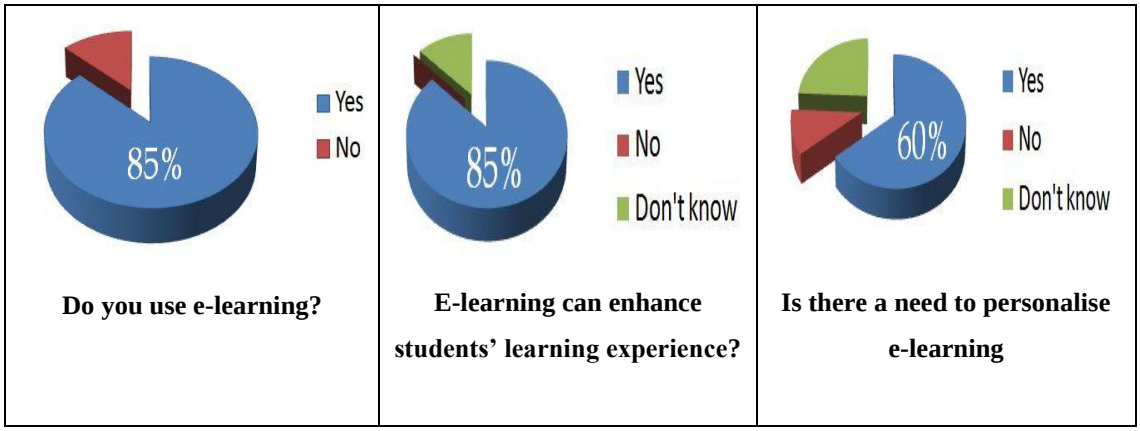

Figure 3.1 – Academics responses

Figure 3.1 illustrates academics responses to: "Do you use e-learning?"; "Do you think e-learning can enhance students' learning experience?"; and "Is there a need to personalise e-learning?" The aggregated responses were: 85% use e-learning; 85% were of the opinion that e-learning can enhance students' learning experience; and 60% thought that there is a need to personalise e-learning to suit individual student's learning requirements. One academic elaborated on the question of needing to personalise e-learning to suit individual student's learning requirements by responding "Perhaps rather than personalising it give them the choice – offer text/audio choice in content also". This opinion concurs with Doering, Pereira and Kuechler (2012) who recommend affording students the opportunity to personalise their own learning experience through a range of interactive learning choices.

Student characteristic	Most Important (1)	(2)	(3)	Least Important (4)
Prior knowledge	22	10	2	5
Learning preferences	9	12	13	4
Cognitive ability	5	10	18	5
Web navigational behaviour	4	7	12	13

Table 3.2 – Academics preference for most important to least important

Table 3.2 depicts academics selected preferences for the most important ('prior knowledge') to the least important ('web navigational behaviour') student characteristic on which to base personalised e-learning. In **Figure 3.2** below this data is illustrated in a bar chart.

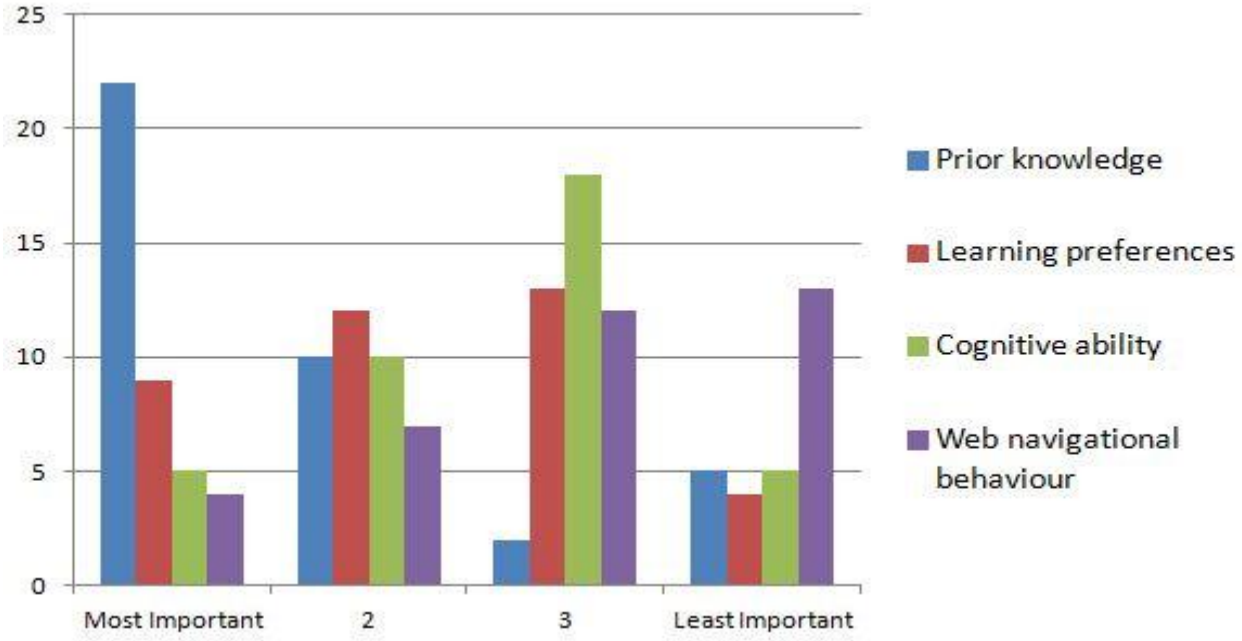

Figure 3.2 – The most important to least important student characteristics

Figure 3.2 shows responses to "In your opinion, what student characteristics are the most important to base personalisation on?" Academics were requested to select on the basis of the most important (1) the least important (4): 55% selected 'prior knowledge' as the most important student characteristic to base personalisation on; 22% selected 'learning preferences'; 13% selected 'cognitive ability'; and 10% selected 'web navigational behaviour'. The high proportion of academics who selected 'prior knowledge' as the most important student characteristic on which to base personalisation concurs with the findings of Sah (2009), 'prior knowledge' is the most commonly used characteristic in determining personalisation in adaptive hypermedia (AH). One academic contributed an interesting perspective on the students' characteristics under discussion:

> "'Prior knowledge' and 'cognitive ability' each have a direct effect on how a student will consume the material. 'Learning preference' plays a role but should not be given precedence over these two factors. 'Web navigational behaviour' can be modified without much difficulty and so should not dictate the structure of the material".

In summary, academics were of the opinion personalisation based on 'prior knowledge' would be the most important and 'web navigational behaviour' would be the least important student characteristic on which to base personalised e-learning. Identifying suitable metrics to determine personalisation based on student characteristics requires further investigation.

Student characteristic	Easiest to achieve (1)	(2)	(3)	Most difficult (4)
Prior knowledge	19	6	4	5
Learning preferences	10	12	7	5
Cognitive ability	2	15	10	5
Web navigational behaviour	7	3	10	11

Table 3.3 – Academics preference for easiest to most difficult characteristic

Table 3.3 depicts academics responses to "which student characteristic would be the easiest to base personalisation on?" Academics were requested to select on the basis of the easiest to achieve (1) the most difficult to achieve (4). This data is displayed as a bar chart in **Figure 3.3** below.

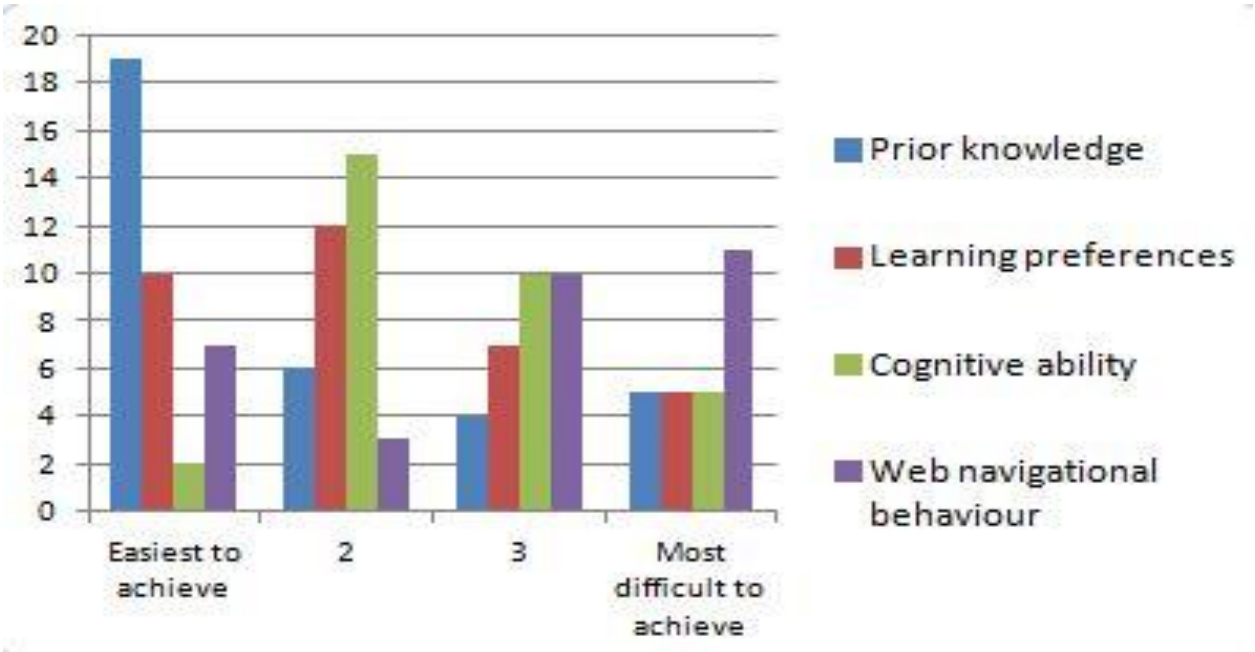

Figure 3.3 – The easiest to most difficult characteristic to base personalisation on

Figure 3.3 illustrates academics responses to "which student characteristic would be the easiest to base personalisation on?": 48% of academics were of the opinion personalisation based on 'prior knowledge'; 25% thought personalisation based on 'learning preferences'; 5% reckoned personalisation based on 'cognitive ability'; and 17% considered personalisation based on 'web navigational behaviour', would be the easiest to achieve.

One academic responded:

> "Knowing a student's 'prior knowledge' would make it very easy to decide what content they should and shouldn't be shown. 'Prior knowledge' could be determined relatively easily by means of some simple questions. 'Cognitive ability' is far harder to determine and would also be hard to account for in the material as it is subject to larger variability. 'Learning preferences' will also vary largely and thus would be difficult to personalise for. 'Web navigational behaviour' would be subject to much the same variation and thus would be hard to personalise for".

In summary, academics were of the opinion personalisation based on 'prior knowledge' would be the easiest to achieve and 'web navigational behaviour' would be the most difficult to achieve. Identifying suitable metrics to determine personalisation based on student characteristics requires further investigation.

There is a clear indication in the data shown in Tables 3.2 and 3.3 above, that there exists a significant relationship between respondents' answers to these two questions. A correlation result of 0.96 indicates a very strong linear positive relationship exists between academics responses to these two questions with respect to 'prior learning'. The correlation results of 0.58 and 0.57 shows a weaker linear positive relationship for 'learning preferences' and 'cognitive ability', respectively, for responses to these two questions. These weak correlations may imply that academics were unclear on how important and easy it would be to represent 'learning preferences' and 'cognitive ability' in personalised e-learning. The strong correlation result of 0.72 for 'web navigational behaviour' indicates academics opinions on this student characteristic are

more clearly defined than 'learning preferences' and 'cognitive ability' but not as strong as academics opinions on 'prior knowledge'. 'Prior knowledge' was perceived as the most important student characteristic on which to base personalisation and the easiest to achieve, and 'web navigational behaviour' was seen as the least important and most difficult to achieve.

Participants were also asked "Would you develop personalisation based on any other student characteristic?": 40% of academics surveyed responded 'Yes'. Some suggestions made were: sound; professional competencies; disabilities; cultural and language differences; full-time or part-time students; motivation; and prior skills. These recommendations would be interesting for future research studies.

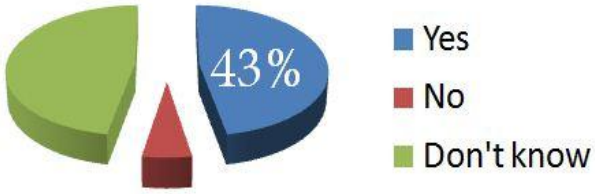

Figure 3.4 – If an authoring tool was available would you use it?

Figure 3.4 shows 43% of academics surveyed agreed they would use an authoring tool for personalising e-learning activities if one was available. This finding is encouraging for researchers involved in exploring the concept of personalised/adaptive e-learning for non-technical authors.

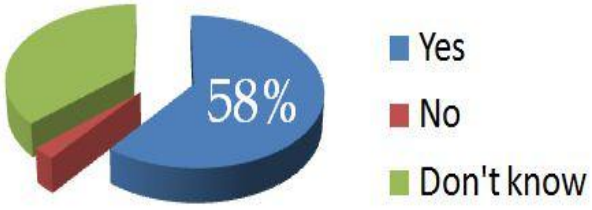

Figure 3.5 – Is there a need for personalised e-learning activities?

Figure 3.5 shows: 58% of respondents were of the opinion that there is a need for personalised e-learning activities; one academic thought there was no need; and the rest did not know.

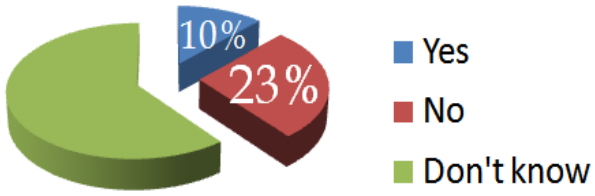

Figure 3.6 – Would you trust the decision making algorithms?

Figure 3.6 shows: 10% of academics would trust the decision making algorithms in an authoring tool to determine the most suitable learning activities for each individual student; 23% would not trust the decision making algorithms; and 50% did not know. The fact that only 10% of academics surveyed would trust the decision making algorithms is a finding of statistical significance that requires further investigation.

Previously mentioned was one academics viewpoint: "'Prior knowledge' could be determined relatively easily by means of some simple questions". One way of obtaining information on students' level of knowledge is by assessing them using a number of simple questions. An alternative way of quickly assessing students' level of knowledge is by assessing them through the use of computerised multiple choice tests. The following question was asked to determine academics views on the use of multiple choice tests in higher education.

Figure 3.7 – Are multiple choice tests suitable?

Figure 3.7 indicates: 58% of respondents agreed that multiple choice tests are suitable as components of continuous assessments or examinations for students in Higher Education; and 25% did not agree. One of the academics commented "assuming they are constructed appropriately", this statement is relevant to all assessment methods, not exclusively multiple choice tests (M. Kim, Patel, Uchizono, & Beck, 2012; Odegard & Koen, 2007). Plagiarism and students copying from each other are also

concerns when using multiple choice tests (De Bra et al., 2004). University guidelines with respect to plagiarism and copying should be observed in personalised e-learning environments, in the same way as in any other learning environment. Gibbs and Armsby (2011) encourage reflection on fairness and transparency when assessing students. Reflection on fairness and transparency should also be considered when constructing personalised learning experiences for students.

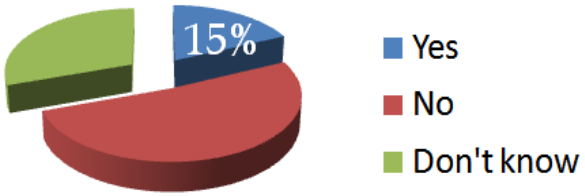

Figure 3.8 – Multiple choice tests are sufficiently rigorous to base decisions

Figure 3.8 indicates: 15% of academics agreed; and 42% did not agree that the results achieved from multiple choice tests are sufficiently rigorous to base a decision on which personalised e-learning activities are selected. Further research is required to identify tests which are acceptable to academics as being sufficiently rigorous to base decisions on which to personalise e-learning.

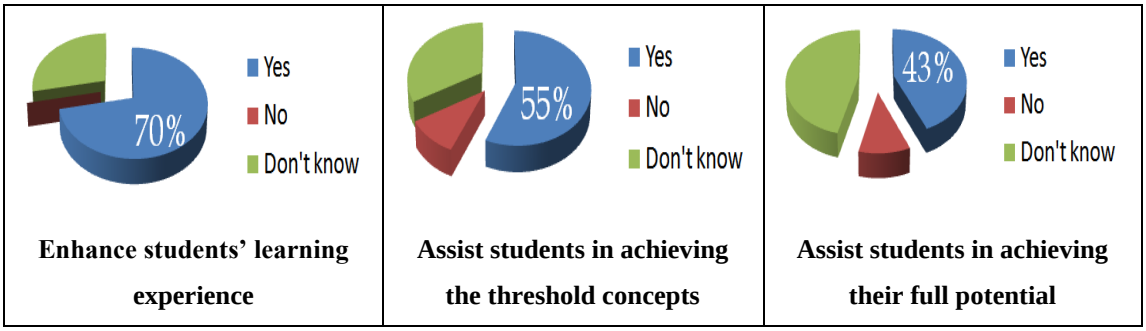

Figure 3.9 – Academics views on enhancing the students' learning experience, assisting students in achieving threshold concepts and achieving their full potential.

Figure 3.9 shows: 70% of academics agreed that the use of personalised e-learning activities would enhance students' learning experience; 55% of academics agreed that the use of personalised e-learning activities would assist students in achieving the threshold concepts or basic units of understanding required in their course of study; and; 43% agreed with the concept that personalised e-learning would assist students in achieving their full potential. One academic responded "but these may need to be

delivered on generic basis to all students to ensure consistency", this is a relevant concern and requires further investigation with respect to personalised e-learning. Finally, 43% of academics agree that personalised e-learning activities would assist individual students in achieving their full potential.

4. Conclusions and Future Work

Personalised e-learning in higher education was seen as a positive approach. The majority of potential academic authors' perceived benefits could be achieved in the following areas:

- Personalising/adapting learning activities
- Achieving threshold concepts and basic units of understanding
- Enhancing e-learning courses

But, some academics were negative regarding how personalisation could be achieved. 'Prior knowledge' was most frequently selected as the most important dimension upon which to personalise learning and the easiest student characteristic to achieve in order to base personalisation. 'Web navigational behaviour' or 'navigation history' was seen as the most difficult student characteristic or dimension on which to base personalisation.

Further research on realising personalised e-learning is required, for many academics (Armani, 2005) to practically actualise students personalised learning experiences (Doering et al., 2012). Students respond differently to feedback and scaffolds depending on their level of 'prior knowledge' (Bulu & Pedersen, 2012; McLaren et al., 2011). Research on students' responses to tutor feedback and scaffolding, in personalised e-learning based on other student characteristics warrants further investigation. Some other student characteristics were suggested by academics on which to base personalisation, future work could focus on determining suitable approaches to developing personalisation based on the alternative student characteristics suggested by participants. Identifying suitable metrics to determine personalisation based on student characteristics requires further investigation. Only 10% of academics would trust the decision making algorithms. Transparency, utilisation, and understanding of algorithms are key factors to be considered in

personalisation, further research is required in this area. Further research is required to identify tests which are acceptable to academics as being sufficiently rigorous to base decisions for personalised e-learning. One academic responded in relation to personalised e-learning: "but these may need to be delivered on generic basis to all students to ensure consistency", this is a relevant concern and requires further investigation. This study contributes to existing research into the development of authoring tools to facilitate the creation of personalised e-learning by non-technical academic authors.

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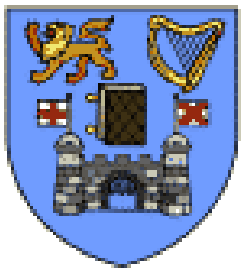

Personalised e-learning

Questionnaire

Eileen O' Donnell, KDEG, TCD.

"Each question is optional. Feel free to omit a response to any question: however, the researcher would be grateful if you responded to all questions."

1. Do you use e-learning?

☐ Yes
☐ No

Please elaborate: _____

_____

_____

2. What do you use e-learning for?

_____

_____

_____

3. What do you consider to be the benefits of using e-learning?

_____

_____

_____

4. What do you consider to be the disadvantages of using e-learning?

_____

_____

"Each question is optional. Feel free to omit a response to any question: however, the researcher would be grateful if you responded to all questions."

5. Do you think e-learning can enhance students' learning experience?

- ☐ Yes
- ☐ No
- ☐ Don't know

Please elaborate:_____

_____

_____

6. In your opinion, is there a need to personalise e-learning to suit individual student's learning requirements?

- ☐ Yes
- ☐ No
- ☐ Don't know

Please elaborate:_____

_____

_____

7. In your opinion, what student characteristics are the most important to base personalisation on? Please select on the basis of the most important (1) the least important (4).

	1	2	3	4
Prior knowledge	○	○	○	○
Learning preferences	○	○	○	○
Cognitive ability	○	○	○	○
Web navigational behaviour	○	○	○	○

Please elaborate:_____

_____

_____

"Each question is optional. Feel free to omit a response to any question: however, the researcher would be grateful if you responded to all questions."

8. In your opinion, which student characteristic would be the easiest to base personalisation on? Please select on the basis of the easiest to achieve (1) the most difficult to achieve (4).

	1	2	3	4
Prior knowledge	○	○	○	○
Learning preferences	○	○	○	○
Cognitive ability	○	○	○	○
Web navigational behaviour	○	○	○	○

Please elaborate:_____

_____

_____

9. Would you develop personalisation based on any other student characteristic?

- ☐ Yes
- ☐ No
- ☐ Don't know

Please elaborate:_____

_____

_____

10. In what way(s) would you envisage personalised e-learning be utilised?

_____

_____

_____

"Each question is optional. Feel free to omit a response to any question: however, the researcher would be grateful if you responded to all questions."

11. If an authoring tool for personalising e-learning activities was available would you use it?

- ☐ Yes
- ☐ No
- ☐ Don't know

Please elaborate:_____

_____

_____

12. What issues deter you from creating personalised e-learning activities?

_____

_____

_____

13. In your opinion, would the use of personalised e-learning activities enhance students' learning experience?

- ☐ Yes
- ☐ No
- ☐ Don't know

Please elaborate:_____

_____

_____

14. In your opinion, is there a need for personalised e-learning activities?

- ☐ Yes
- ☐ No
- ☐ Don't know

Please elaborate:_____

_____

_____

"Each question is optional. Feel free to omit a response to any question: however, the researcher would be grateful if you responded to all questions."

15. Would you trust the decision making algorithms in an authoring tool to determine the most suitable learning activities for each individual student?

- ☐ Yes
- ☐ No
- ☐ Don't know

Please elaborate:_____

_____

16. Please list any pedagogic merits you feel may be achieved by using personalised e-learning activities?

_____

_____

17. In your opinion, are multiple choice tests suitable for use as components of continuous assessments or examinations for students in Higher Education?

- ☐ Yes
- ☐ No
- ☐ Don't know

Please elaborate:_____

_____

_____

18. In your opinion, would the results achieved from multiple choice tests be sufficiently rigorous to base a decision on which personalised e-learning activities are selected for each individual student?

- ☐ Yes
- ☐ No
- ☐ Don't know

Please elaborate:_____

_____

_____

"Each question is optional. Feel free to omit a response to any question: however, the researcher would be grateful if you responded to all questions."

19. In your opinion, would the use of personalised e-learning activities assist students in achieving the threshold concepts or basic units of understanding required in their course of study?

- ☐ Yes
- ☐ No
- ☐ Don't know

Please elaborate:_____

_____

_____

20. Would you agree or disagree with the following statement:

"Personalised e-learning activities would assist individual students in achieving their full potential."

- ☐ Agree
- ☐ Disagree
- ☐ Neither agree nor disagree

Please elaborate:_____

_____

_____

The time taken to complete this survey is greatly appreciated. Please print out the questionnaire, complete and leave on my desk in KDEG Lab 1, alternatively return the completed questionnaire to me by e-mail: odonnee@scss.tcd.ie

Thanking you,

Eileen O' Donnell.