Deconstruction, Confusion and Frequency: Surveying Technology Use by Vocational Teachers

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ABSTRACT

This paper reports on a survey of the use of online technology by VET teachers and compares the survey method with similar research. While there is some comparison of results from similar surveys, this is not the central concern of the paper.

It is argued that surveys into the adoption of technology for teaching and learning require the deconstruction of the functionalities of the technology in terms that are relevant to the respondent group. The use general and ill-defined terms such as online learning and e-learning are ineffective in providing meaningful data on the uptake of technology for teaching and learning. My second contention is that surveys should provide an option for the respondent to indicate that they are either not sure or do not understand the question. Finally, I contend that effective surveying of technology for teaching and learning should collect data related to the frequency with which the respondent uses the specific functionality. In the absence of such data it is not possible to determine if the use is a novel experience that has not been repeated or the use of the functionality in a systematic manner.

INTRODUCTION

Networked computers have been used for computer managed assessment, communication and distribution of learning materials since the early 1990s. With the public availability of the Internet from 1995, interest in the use of online technology for teaching in vocational education and training (VET) grew exponentially. The first national conference on the use of online technology in VET , Net*Working, was held in 1997 (Office of Training and Tertiary Education, 2002). Nationally, the *Australian Flexible Learning Framework for the National Vocational Education and Training System 2000-2004* set a target that Australia would be recognised as a global leader in applying new technologies to vocational education and training products and services by 2004 (Australian National Training Authority, 2001). Since 2000, the national VET system has allocated up to $20 million per annum to the development of creative capable people, supportive technological infrastructure, online content development, applications and services, enabling policy, and problem solving regulation (Flexible Learning Advisory Group (FLAG) Secretariate).

Earlier reviews report difficulty in accurately assessing the uptake of online technology in VET (Brennan, Horton, McNickle, Osborne, & Scholten, 2003; Horton & Osborne, 2003). These difficulties have been related to a lack of reliable data, methodological differences, and to a high level of confusion surrounding definitions of commonly used terms such as online learning and online delivery (Brennan, McFadden, & Law, 2001; Cashion & Palmieri, 2000; Kilpatrick & Bound, 2003).

Methodological differences may make comparison of results difficult but has the benefit of providing multiple sources of information. The lack of definitional clarity surrounding terms related to the use of online technology is a more critical concern.

Terms related to online technology in education are often used interchangeably. These include online delivery, web-based delivery, online learning, online education and training, computer-mediated communication learning, technology-based courses and electronic course delivery (Booker, 2000). Even single terms such as online learning and online delivery are subject to multiple definitions and interpretations (Brennan et al., 2001; Hill et al., 2003). The definitions used for the application of online technology to support teaching and learning vary in relation to at least four factors.

1. The nature of the technology used. These include Internet, intranet, computer networks, wide area networks (WAN) and local area networks (LAN).
2. The level of integration of online technology into program delivery and assessment. Technology may be integrated into whole courses, single subjects or parts of courses.
3. The relationship with other delivery strategies such as face-to-face and distance learning.
4. The level of interaction between teacher and learner and between learners.

More recently the term e-learning has emerged, here again there is a lack of definitional clarity. Some definitions limit the scope of e-learning to the use of networked technologies and the Internet (Garrison & Anderson, 2003; Gillani, 2003). Others define e-learning as a broader notion than online learning to include technologies such as satellite broadcast, audio/video tape, interactive TV, CD-ROM. This is a view consistent with the position of the Australian National Training Authority (ANTA).Other technologies might include DVD, stand alone computers and personal electronic devices including digital telephones (Bowles, 2004). To add further confusion terms such as 'integrated e-learning' (Jochems, van Merrienboer, & Koper, 2004) and blended learning (Bersin, 2004) have become more common in reference to the use of online technology in teaching.

In summary, documents related to the use of technology are often inconsistent in their definition. The frequent lack of a clear definition to describe the scope of its meaning is problematic. Without explicit definition of terms related to the use of technology it not possible to collect reliable data and methodological differences become irrelevant. Whilst there is a lack of definitional clarity in terms related to the use of online technology for teaching and learning, the functional attributes are more readily identified. These include

the distribution of information, searching for information, synchronous and asynchronous communication, interaction and the collection of data for assessment or monitoring.

This paper reports on a survey of VET teachers and compares the survey method with that used in other research. Whilst the results of the research are reported the focus is on the method rather than the results. I argue that the strengths of my survey approach are that:

1. The functionalities of the technology surveyed are deconstructed in terms that are relevant to the respondent group. Thus avoiding the use of general and ill-defined terms such as online learning and e-learning.
2. The respondents are able to indicate that they are either not sure or do not understand the question.
3. The survey collects data related to the frequency with which the respondent uses the specific functionalities. In the absence of such data it is not possible to determine if the use is a novel experience that has not been repeated or the use of the functionality in a systematic manner.

SURVEY METHOD AND RESULTS: AN OVERVIEW

The survey is divided into two parts (see Appendix 1). The first section of the survey collects demographic details related to the: time fraction that the person spends teaching; gender; age; and employment at a TAFE college or private provider. The second section of the survey asks respondents to estimate how frequently they used fourteen possible functionalities of online technology. Respondents are able to indicate that they use the specific functionality daily, weekly, monthly or never. They are also able to indicate that they are not sure. These functionalities are broadly related to the capacity of online technology for communication, searching for information, and, distribution of resources and assessment. The functionalities surveyed are:

1. Communications
   a. Individual email between teacher and learners
   b. Group email between teacher and learners
   c. Bulletin board or notice board(s)
   d. Group email between learners and learners
   e. Discussion forums
   f. E-portfolio
   g. E-journal
   h. Blog
2. Searching for information
   a. Internet searches for learners to access information
3. Distribution of resources
   a. Repository for learning resources as word, excel and powerpoint files
   b. Repository web-based (html) learning resources
   c. Repository for learning resources as sound or image files
4. Assessment

  a. Repository for text based assessment resources
  b. Repository for computer marked assessment

The survey (Appendix 1) was emailed to 130 vocational teachers who are enrolled in a post-graduate teacher training program in Victoria. Therefore, the survey has collected data from a microcosm of vocational teachers. In total 55 surveys were returned, a response rate of 43%. Respondents are given the option to identify themselves by name and are able to return the completed survey by email or by post. All respondents were identifiable from their returned surveys. Data from the returned surveys were entered into a simple spreadsheet. Tables and graphs found in the current document are exported from the spreadsheet.

Of the 55 respondents to this survey, 48 (87.3%) are employed at a TAFE college and 7 (12.7%) at a private provider. As summarised in Table 1, the group is approximately evenly divided into male (n=29, 52.7%) and female (n=26, 47.3%). The majority are 40 years or older (n=36, 65.4%) and employed on a full time basis (n=33, 60.0%). Table 2 details the raw responses in numeric terms and as a percentage of the total responses for each online functionality.

The results of the survey show that the following online functionalities are used by at least 50% of respondents on either a daily or weekly basis.

- Individual email teacher to learner
- Repository for learning resources, word, excel, powerpoint
- internet searches for learners

In addition to these functionalities, the following are used daily, weekly or monthly by at least 50% of respondents.

- Web based learning resources
- Group email teacher-learners
- Repository for sound or image
- Text based assessment resources

In contrast there are also a range of online functionalities that respondents indicate are never used by at least 50% of respondents.

- Bulletin board or Notice board
- Computer marked assessment
- Group email learners to learners
- Discussion forums
- E-portfolio
- E-journal
- Blog

DISCUSSION

In this paper, I contend that surveys that use general and ill-defined terms such as online learning and e-learning are ineffective in providing meaningful data on the uptake of technology for teaching and learning. A more effective method is to deconstruct the technology into functionalities that are meaningful to the respondent group. Despite attempts to survey using terms that respondents can understand it is possible that terminology may include unfamiliar language. Therefore, surveys should provide an option for the respondent to indicate that they are either not sure or do not understand the question. A further contention is that effective surveying of technology for teaching and learning should collect data on the frequency with which the respondent uses the specific functionality.

Whilst my research relates to the uptake of online functionalities by VET teachers, research related to the use of online technology by students has been conducted by others. This research is instructive in demonstrating weaknesses in previous research method.

For example, data collected by the National Centre for Vocational Education Research (NCVER) in 2000, 2001 and 2002, suggested that online technology was used as part of the course delivery for less than 2.5% of students (Hill et al., 2003; National Centre for Vocational Education Research, 2002). The weaknesses of this research are that the meaning on 'online learning' is not defined, there is no deconstruction of functionalities or survey of frequency. A more recent survey of e-learning uptake in Australia, the *2005 E-learning Benchmarking Project,* uses a broad definition of 'e-learning' as access to, downloading and use of web, CD-ROM or computer-based learning resources in the classroom, workplace or home (I & J Management Services, 2005). This general definition includes the use of a diverse range of digital technologies at a range of locations, possibly in combination with other teaching and learning approaches. As part of the *2005 E-learning Benchmarking Project*, an online survey of 443 VET students found that 94% reported that they have some component of e-learning somewhere in their VET course. Students reported the level of e-learning in their course as a lot (38%), some (37%), a little (19%) and none (6%) (I & J Management Services, 2005). The strength of this data is that it provides some indication of frequency of use. However, the broad definition of e-learning provides little illumination as to which technologies or their functionalities are used or how frequently. The data suggests a much higher use of e-learning than earlier reports on the use of 'online learning'. However, the definitions used in these surveys are both general and distinctly different. As a consequence, meaningful comparison between the two is unreliable.

This survey reports that 60% of 478 VET teachers from across Australia report using e-learning in the last 12 months. The *2005 E-learning Benchmarking Project* collects data on a range of e-learning functionalities and the results are summarised in Table 3. However, some of the functionalities surveyed require significant interpretation on the part of the respondent. For example, collecting data on the 'Use of multimedia interactive learning resources in the classroom' incorporates the ill-defined concepts of multimedia and interactive. In comparison with the student survey that provides some indication of the

level (a lot, some, a little, none) of e-learning experienced in studies, no indication of the frequency with which teacher's use specific functionalities is reported. A positive response may indicate only a single use on a 12 month period. This data does not provide reliable information if one is trying to assess whether a specific functionality is being used in a systematic way to support teaching and learning. A further weakness of the *2005 E-learning Benchmarking Project* is that respondents are only provided a yes/no option in respect to use. There was no option for indicating a lack of understanding. Respondents could not indicate that they were unsure.

My survey was successful in collecting data on the frequency with which 55 VET teachers use 14 online functionalities. When the survey approach is compared with the other research reported above I believe that there are a number of benefits if one is attempting to collect reliable data on the adoption of technology for teaching and learning.

1. Deconstructing general concepts such as online learning and e-learning into functionalities avoids the confusion and difficulties associated with the use of general terms that are open to diverse interpretation.
2. The deconstructive approach provides more fine grained data than is gathered by more general surveys. This deconstruction allows an analysis of functionalities that VET teachers use more or less frequently. On the basis of these results it is then possible to ask questions such as:
    a. Why do teachers adopt some online functionalities and not others?
    b. Has the investment in particular types of online functionality been worthwhile? For example, the current research finds that computer marked assessment is never used by at least 50% of VET teachers. The *2005 E-learning Benchmarking Project* finds that only 34% of respondents have been involved in the use of online assessment in the last 12 months. Given the high level of investment that is required to set up and maintain computer marked assessment, questions about the value of this investment might be asked. In comparison, email would appear to be used to support learning in a number of ways. This low cost technology receives little publicity in the promotion of online technology to support teaching and learning. Is it possible that the use of such simple and cheap technologies should be more highly promoted?
3. Respondents are able to indicate that they do not understand or are confused about the terminology of the survey. Thus minimising inaccurate responses.

Comparison of the survey method of the *2005 E-learning Benchmarking Project* and my own research in the light of the three principles of deconstruction of technology functionalities, the ability for the respondent to indicate that they are 'not sure', and surveying of frequency of use leads to suggestions for improvement of my survey.

1. Include the collection of more demographic data that would allow more detailed analysis of results against particular demographic groups.

2. In addition to providing respondents with the opportunity to indicate that they use an online functionality on a daily, weekly and monthly basis, include the option of indicating that the online functionality is used less than monthly.
3. Include additional functionalities such as electronic submission of work and use of 'flexible learning toolboxes' which are found in the *2005 E-learning Benchmarking Project*. Also emerging functionalities such as audio or podcasting.

CONCLUSION

This paper reports on the use of a survey that successfully collects data on the frequency with which VET teachers use 14 online functionalities. Functionalities that are use at least daily, weekly and monthly are identified to reveal functionalities that are used most and least frequently by the 55 respondents. Recommendations for the improvement of the survey are made.

Time fraction	1 day	2 day	3 day	4 day	Full Time
	4 (7.3%)	8 (14.5%)	6 (10.9%)	4 (7.3%)	33 (60.0%)
Employer	TAFE College			Private Provider	
	48 (87.3%)			7 (12.7%)	
Gender	Male			Female	
	29 (52.7%)			26 (47.3%)	
Age	20-29 years	30-39 years		40-49 years	50+ years
	5 (9.1%)	14 (25.5%)		19 (34.5%)	17 (30.9%)

Table 1: Demographic data

Respondents use of online functionalities:	Daily		Weekly		Monthly		Never/ Not Sure	
	#	%	#	%	#	%	#	%
Individual email teacher to learner	23	41.8	13	23.7	12	21.8	7	12.7
Repository for learning resources, word, excel, ppt	16	29.1	19	34.6	11	20.0	9	16.4
internet searches for learners	9	16.4	21	38.2	15	27.3	10	18.2
Web based learning resources	9	16.4	16	29.1	16	29.1	14	25.5
Group email teacher-learners	4	7.3	13	23.7	19	34.5	19	34.5
Repository for sound or image	8	14.5	10	18.2	16	29.1	21	38.2
Text based assessment resources	5	9.1	8	14.5	19	34.6	23	41.8
Bulletin board or Notice board	2	3.6	7	12.7	9	16.4	37	67.3
Computer marked assessment	1	1.8	3	5.5	7	12.7	44	80.0
Group email learners to learners	3	5.5	1	1.8	5	9.1	46	83.6
Discussion forums	1	1.8	3	5.5	4	7.3	47	85.5
E-portfolio	1	1.8	0	0.0	4	7.3	50	90.9
E-journal	0	0.0	1	1.8	2	3.5	52	94.5
Blog	0	0.0	1	1.8	0	0.0	54	98.2

Table 2: Frequency of use of online functionalities. Raw data.
(n=55)

E-Learning Functionalities	Reported Use (%)
Online access to/downloading of learning materials and resources	63
Electronic submission of work	61
Use of multimedia interactive learning resources in the classroom	50
Online access to and participation in course activities	45
Remote use of multimedia interactive learning resources	42
Structured learning-based email communication	36
Online assessment activities	34
Posting messages to a group through online bulletin board	33
Using flexible learning toolboxes	31
Online group discussion	27
Online simulations	20

Table 3: Reported us of e-learning functionalities in the last 12 months

APPENDIX 1

Name (optional):

Please circle the most appropriate

	Yes	No
1. Are you employed in a training role?	Yes	No

If no, then do NOT proceed!!!

	1 day	2 day	3 day	4 day	full time
2. What time fraction do you teach?	1 day	2 day	3 day	4 day	full time

	RMIT	Other public provider	Private provider or enterprise
3. Where are you employed?	RMIT	Other public provider	Private provider or enterprise

	male	female
4. Gender	male	female

	20-29	30-39	40-49	50+
5. Age	20-29	30-39	40-49	50+

Please fill in the right hand box

6. Vocational discipline area e.g. plumbing, graphic design	

How often do you use the following online capabilities in your teaching practice?

Please tick the most appropriate box

Definitions
➤ Online implies the use of networked computers, that is computers linked to an intranet or the Internet
➤ Teaching practice implies
   a. Interaction between a teacher and learner(s), may be face-to-face, at a distance or some combination
   b. The use of online technology for learner support, teaching or assessment

	Daily	Weekly	Monthly	Never	Not sure
7. Individual email - teacher to learner					
8. Group email – teacher to learners					
9. Group email – learners to learners					
10. Bulletin board or notice board(s)					

	Daily	Weekly	Monthly	Never	Not sure
11. Discussion forum(s)					
12. Blogs (Weblog)					
13. Internet/Intranet searches for learners to access information					
14. Internet/Intranet as a repository for **learning resources** as *word, excel or powerpoint files*					
15. Internet/Intranet as a repository for **learning resources** as *sound or image files*					
16. Internet/Intranet as a repository for *web-based* (html) **learning resources**					
17. Internet/Intranet as a repository for *text based* **assessment resources** e.g. assignments, case studies					
18. Internet/Intranet for **computer marked assessment** e.g. multiple choice, true/false questions					
19. E-portfolio					
20. E-journal					
21. Other (please list and indicate frequency)					

Please complete and return to:

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