

Librarians becoming competent: Technology acceptance in the workplace

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Abstract

Purpose: The purpose of this paper is to provide an overview of the preparedness of vocational education and training (VET) sector library staff in Australia and New Zealand to deliver services to mobile technologies.

Design/methodology: A representative sample of staff from 14 Australasian VET libraries was selected, including three positions from each library: Library Manager, Systems Librarian and Qualified Librarian. Data from the sample were exposed to two levels of analysis, both qualitative and quantitative. A slightly-modified version of the Unified Theory of Acceptance and Use of Technology (UTAUT) model was employed as a predictor of behavioural intention and use behaviour. This model allowed granular level of detail to emerge through the capacity to drill down to individual characteristics influencing predictability to accept technology innovation.

Findings: An evaluative summary is provided of the workforce competencies and skills that 42 VET library staff viewed as critical and necessary to meet the new technologically-enhanced professional environment. The paper also presents findings on the best approach to identifying if skills are lacking and preferred methods for addressing deficits. The impact of staff demographics upon identified skills requirements and preferred training implementation are examined.

Practical implications: In a field where previous research is sparse and empirical investigations even fewer, the findings discussed in this paper offer meaningful insights to library and information science practitioners with particular reference to mobile libraries, workplace training, technology adoption and library service provision.

Keywords: mobile libraries, VET sector libraries, UTAUT model, workplace training

Paper type: Research paper

Introduction

The ubiquity, power and adaptability of the variety of technologies libraries use to drive operations provide opportunities for interconnectedness on a scale hitherto unrealisable. Technology is forcing consideration of optimised information delivery, streamlined work methods, networking and interrelationships and heightened user expectations. This carries costs as well as challenges (Cunningham, 2010), not least of which is moving the human element of technology change into primary focus (Chu, 2012). Libraries are facing constant and substantial change (Lakos & Phipps, 2004) and technology is forcing consideration of optimised information delivery, streamlined work methods, networking and interrelationships and heightened user expectations. Increasingly, the environment within which many libraries operate is characterised by the development of information and service delivery via mobile devices. Librarians are being urged to understand the trends in mobile use, incorporate that knowledge into professional skill sets and engage with user technology expectations and preferences (Cartwright, Cummings, Royal, Turner, & Witt, 2012; Greenall, 2010; Walsh & Godwin, 2012).

This paper discusses findings from a research study investigating the competencies vocational education and training (VET) sector library staff planning mobile service delivery believe are crucial, and the most effective means of acquiring such knowledge and skills through professional development and workplace learning opportunities. The investigation posed two questions:

What skills, knowledge and competencies are required by library staff to develop and deliver mobile technology services in the vocational education and training sector?

What specific on-the-job training is required by library staff in the vocational education sector to acquire the skills, knowledge and competencies to effectively develop and deliver mobile technology services?

Through the research questions, the investigation sought to address the following objectives:

1. To identify the library services most effectively and appropriately delivered through mobile technologies to vocational education students
2. To identify gaps in the required and current knowledge and skills of library staff in relation to delivering mobile services
3. To determine the most effective means of ensuring library staff engaged in mobile delivery have opportunities for professional development and workplace learning programmes and activities

There existed a paucity of information relating to the VET library sector and with the impact of mobile technologies upon this sector remaining restricted to anecdotal reporting. It was assumed that a contributing factor to the apparent slowness in the uptake of mobile service delivery was a lack of confidence and competence amongst the library staff themselves. It is critical that VET library and information professionals are appropriately prepared to realise the nascent potential of mobile technologies in the workplace. This is an imperative for staff development, service improvement and student benefit.

Mobile Libraries

The mobile library has been defined as “libraries that deliver information and learning materials on mobile devices such as cell phones, PDAs, palm top computers, and smartphones to allow access by anyone from anywhere and at any time” (Ally, 2008, p. liii). However, a continuing challenge facing libraries is what constitutes an effective mobile library and what role it should play in relation to supporting mobile learning and teaching (Cao, Ally, Tin, Schafer, & Hutchinson, 2008; Lippincott, 2008a, 2010). As yet, there is little common ground being demonstrated across the library community in relation to mobile technologies. An increasing number of libraries are undertaking research to understand the potential opportunities enabling mobile access to services offers, while others, subject to a variety of constraints, have preferred to wait and watch (Cao, Tin, McGreal, Ally, & Coffey, 2006, p. 1289; Carlucci Thomas, 2010).

As information becomes increasingly mobile and social (Walsh & Godwin, 2012), it is important that libraries understand user requirements as regards information delivery to mobile devices. If they are successfully to offer the online services their users are increasingly expecting, libraries need to leverage the technology their patrons are comfortable and familiar with (Kroski, 2008; Mbambo-Thata, 2010, p. 467). Training and development of staff in the use of technology has emerged as the third most-acknowledged concern across the Further Education sector in the United Kingdom (JISC, 2011, p. 9). Specifically, the requirement for additional training for library staff in how to develop and deliver high quality mobile learning resources and services, combined with improving/maintaining the quality of existing provision of services, has continued as a critical factor. This issue has been identified in a range of studies where a lack of highly-skilled, continually-retrained staff members remains a crucial factor to be addressed in an organised manner (Chesemore, Van Noord, Salm, & Saletrik, 2006, p. 5; Cunningham, 2010).

Methodology

The nature of the investigation determined a sequential, mixed methods approach to be of greatest potential value. A range of qualitative theories was employed, including grounded, interpretive, as well as quantitative, including positivist, use of a technology acceptance model. The use of triangulation ensured that the investigation, data collection and analysis were conducted from several angles, rather than a single theoretical approach. Staff from eight Institutes of Technology and Polytechnics (ITPs) in New Zealand and six Technical and Further Education institutions (TAFEs) in Australia, which included a library workforce of greater than 10, participated in the research. The staff sample were interviewed via Skype and then completed an online survey. Triangulation methodology included the online surveying of student library users from the same institutions as the staff sample. Grounded theory, used extensively in qualitative analysis and which allows for the emergence of theories from the data rather than the existence of theories prior to the data analysis, was considered appropriate to the present study and formed the basis for two-phased analysis.

The data were tested in the second, quantitative phase of analysis using a technology acceptance model to explore the predictive capability of the data. The Unified Theory of

Acceptance and Use of Technology (UTAUT) model was tested against the data, with modifications made to the original model to enable closer alignment with the present research. A series of six hypotheses accompanied the model and the coded data from the qualitative phase were further tested against these hypotheses.

Findings

The data were analysed by position type (Library Manager, Systems Librarian and Qualified Librarian), mobile technology competence, and length of service. The 42 participants covered a wide spectrum of service length: from 3.5 years through to 40 years. The majority fell within the medium service length range of 11-20 years (40.6%), while, 21.4% of staff had been employed in the library profession for between 21-30 years and 16.6% for between 31-40 years. These results may be compared to those shown in the 2006 NeXus survey of TAFE library staff where 15.3% of staff had been employed for less than 5 years, 37.9% for between 6 to 15 years and 46.8% for more than 16 years (Hallam, 2008, p. 36). The present study showed far greater percentage of staff employed for more than 16 years (61.8%). The mean service length for each position type was library managers 23.3 years, systems librarians 16.3 years and qualified librarians 19.7 years.

When the VET library staff assessed their knowledge and use of mobile technologies, the majority regarded themselves as competent users (35.7%), followed by those who designated themselves beginners (28.6%). When comparing length of service with technology competence, staff who had longer employment length regarded themselves as less competent mobile technology users. The average employment length for Beginners and Average competence was 24 and 25.6 years respectively. At the other end of the competence spectrum were the advanced users who had the shortest length of employment, averaging 8.75 years. This appears to support the school of thought proposed by exponents such as Prensky (2001) in his opinion piece on digital natives and immigrants, who noted that younger students, growing up in the midst of technology, were confident in its use unlike their older instructors who spoke an out-dated, pre-digital language. However, the interview responses revealed that many of the longer-serving staff were also very positive in their attitudes towards proficiency in using technology and could clearly see benefits. Overall, slightly more than half the sample (n=24) regarded themselves as being competent or more advanced in using mobile technologies. These findings indicate that when investigating skills and competencies required in the workplace to harness technology effectively to service delivery, information on existing personal technology competencies should be gathered at the same time, if not previously

The VET library environment had been experiencing considerable technology change during 2009-2010, as evidenced by the sixty-four unique technologies identified as having been implemented across the 14 libraries. This was a significant number for any workforce to be dealing with, given that technology is only one aspect of the various changes in librarianship occurring at any given time. The technologies adopted included those involving substantial resource investments such as Library Management System upgrades (33%), the implementation of a Learning Management System (21%), RFID (11%) or a discovery layer product (10%). Other technologies such as Twitter, Facebook, blogs and wikis required moving the libraries into the social networking space, with the implied requirement of

addressing how best to deliver services through the most effective avenues. Subscription to e-books and loan of e-book readers, laptops, notebooks and computers on wheels (COWs) indicated the participating libraries were conscious of, and responding to, alternate expectations of information access. The strong move to provision of a wireless environment (70%) was indicative of institutional ICT student support strategies, and the library/learning commons, as a central place where students tended to congregate, was often a primary location for wireless hotspots. The implementation of these latter technologies was clear evidence of the transition already underway across the VET library sector towards acknowledging the arrival of mobile technologies, and developing, and potentially promoting, services for handheld devices

In predicting which library services could effectively be offered in the mobile environment, VET library staff revealed a degree of conservatism. They showed preference for traditional services, such as library catalogue and online databases, although they had scant evidence that this was what students either wanted or used. This was an acknowledged deficiency that a number of staff recommended be addressed prior to proceeding further. Nevertheless, overall, staff were of the opinion that students both used and wanted mobile technology-enhanced service and expressed the belief they would be capable of offering improved service through acquiring mobile technology capability. A positive attitude accompanied this belief and emerged as a competency, although tempered by the 'excited versus hesitant' tension associated with the technology adopter categories.

Skills Required to Work Effectively in the Mobile Technology Environment

When asked what skills and competencies they believed were required to work effectively in the mobile technology environment, staff focused quite specifically on the skills they felt they did not possess and would require if they were to cope with the new technologies. Three factors emerged as important skills, competencies and knowledge required by library staff: technology immersion, attitude and knowledge of patron behaviour. Technology immersion, the practical mastery of handheld devices, was regarded as crucial. Nearly half the staff sample suggested that their employer should provide a range of mobile devices and allow staff access to these devices during work time to enable experimentation with features and functionalities, even to allow them to take them home. Lack of familiarity with any handheld devices was seen as a risk to library staff being able to work effectively in the mobile environment. A number of responses indicated that library staff believed they could not assist students with mobile devices if they lacked familiarity.

Attitude, defined earlier as an individual's positive or negative evaluation of the performance effect of a particular behaviour, emerged as the second most important factor for staff to possess. The importance of attitude in technology acceptance has been noted in a number of previous studies (Fishbein & Azjen, 1977; Lapczynski & Calloway, 2006; McDonald, Cullen, & Comrie, 2009; Parayitam, Desai, Desai, & Eason, 2010; Rabina & Walczyk, 2007; Venkatesh & Davis, 2000). A positive attitude to technology implementation was demonstrated by almost half the library staff interviewed. This emerged in comments from staff feeling they could more readily assist student queries, that they were gaining useful

knowledge in IT, their jobs were being made easier, they were pioneers or at the forefront of technology within their institution and were keen to demonstrate this to students.

Adaptability and a willingness to try things out were considered crucial to developing skills and knowledge in the mobile environment. In order to extend existing services and competencies into the mobile environment, staff spoke of the need for curiosity, keenness, and experimentation, and felt that:

The skills area is easily taught, this is not a problem. More important is interest, enthusiasm; the ability to embrace change and curiosity about new technology, how the tools can be used. If the interest, passion and curiosity is there, then the skills and the usefulness will follow [D1].

Knowledge of patron behaviour was another important factor identified by library staff as enabling effective work in the mobile technology environment. Ten staff, including four library managers, four systems librarians and two qualified librarians, believed that effective service meant being able to anticipate the technology-related questions students would be asking, having a working knowledge of the devices they were using and being able to assist when approached for help. This was described by several staff as providing basic troubleshooting. A change in traditional service provision focus was noted which included the need to be able to think in a different way in order to provide relevant service. They felt that the goal of customer focus should include flexibility and acceptance that the learning styles and technology attitudes of their student cohort are changing.

All three positions saw the need for curiosity and considered state of mind as being more important than skill acquisition. No differentiation was made regarding length of tenure, age of staff (only one library manager mentioned problems with older library staff lacking interest in adopting new technologies and embracing change), position within the library, and contact with patrons. Age, as a factor in technology acceptance, has been widely studied (Akman & Mishra, 2010; Morris & Venkatesh, 2000; O'Brien, Rogers, & Fisk, 2012) with a strong acknowledgement that older employees react more positively to implementation of IT initiatives than their younger counterparts, contradicting conventional beliefs that older adults resist IT innovation (Rizzuto, 2011). The present research corroborated these findings with VET sector library staff, the majority of whom were of longer tenure, demonstrating a positive attitude towards technology implementation.

Library staff spoke of already possessing the competencies needed, that the mobile environment constituted another evolutionary stage in the changes that had been taking place for many years in the library profession. They felt that:

A lot of current skills they already have, they just need to become familiar with the technology, the devices. It is just another iteration of what happens with libraries, nothing ever stays the same [J3].

This belief that librarians possess the fundamental competencies required to fulfil their role within changing environments, including the ability to link new technologies with new opportunities, was consistent across all positions and all lengths of service tenure.

The changing environment resulted in the need to up-skill being identified as the most crucial outcome of technology implementation by 40.5% of staff across all three positions. Despite this strong awareness, the findings suggest that those libraries that have implemented new technologies during the past two years have not adequately prepared their staff through professional development or workplace learning activities prior to implementation. Such a situation is commonly reported across the global education environment where failure to incorporate technology training into planning or preparation has been presented as a barrier or limitation to effective practice (Drent & Meelissen, 2008; Krysa, 1998; Thompson, Schmidt, & Davis, 2003). What emerged from the findings was that those staff with an interest in technology appeared to have taught themselves skills and acquired knowledge while others had held back

There was clear evidence that library staff saw the benefits of technology first and foremost in terms of direct benefits to student library users, providing examples such as:

It makes it more flexible. We can operate outside the physical library, we can reach more audience, with SMS [F2],

Information is getting to students easier and quicker. Less library staff are involved in getting information out; it is an instant, easy way of communicating [F3].

The majority of staff (90.5%) viewed the implementation of technology in their working environment as something inevitable, that the technology was there to stay and they were actively looking for ways to integrate it into their work.

Ascertaining Professional Development Requirements

VET sector library staff showed a preference for simple, direct methods of determining mobile technology skills gaps. Almost half of the 42 staff indicated a survey would be the best way to obtain the information. The survey method was more popular with qualified librarians (n=8) than with library managers (n=4) or systems librarians (n=6). The next preferred method (n=12) was to ask staff. This method was supported by holding general conversations with staff to pick up gaps in competence and by library managers initiating individual discussions with staff regarding training opportunities.

Comparison of types of assessment methods showed qualified librarians demonstrating greater preference for methods such as using mentors, getting the e-learning unit to run the gap assessment, examining examples of good use or the provision of a technology skills checklist. Library managers took a slightly different approach. They expressed preference for methods such as mapping competencies to job descriptions and key performance indicators (KPIs), in-house workshops, an annual performance review, a multi-year professional development plan, the manager observing and identifying competencies and needs and, finally, modification of either the institutional professional development plan or a national technology competency standards guideline. Systems librarians favoured technology showcases, innovators determining the gaps, and staff self-analysis. These slightly different approaches to the same issue suggest that position within the library may influence preferences for establishing baseline data. The findings also extend existing knowledge

relating the influence of position within an organisation upon professional development delivery.

Workplace Training Requirements and Delivery

Library staff displayed a preference for hands-on, self-paced learning with the time commitment and access to the technology being factored in. Their primary interest lay in action-based, applied learning. Apart from library managers, they displayed little interest in spending time learning theoretical concepts. The use of PowerPoint as an instructional tool was inveighed against, with a number of staff making comments such as:

there is no point having a PowerPoint up on how to use mobile phones or an iPad. We need access to the technology so everyone can use it and experiment [D3].

VET library staff clearly expressed the wish to be at the centre of experiential learning rather than being passive learners. Such preference may be linked back to the positive attitude demonstrated by staff, with their belief that the new technology offered tangible benefits affecting their attitude towards training. Immediacy of assistance at point of need was seen as important, as was a collegial approach to learning where the innovators/champions/early adopters/keen staff guided their colleagues through the competencies acquisition process. Service length did not appear to influence this attitude, both greater and lesser service lengths expressed preference for hands-on training assisted at point of need by a more experienced colleague. When assessing the preference by position, little difference emerged. From these findings it may be stated with confidence that, given a range of training options, staff will display a preference for on-the-job, hands-on experimentation with technology, regardless of position, length of experience or particular library.

Conclusion

The study revealed that the impact of mobile technology implementation raised strong awareness amongst library staff for the need to acquire skills to realise the associated benefits. Staff were keen to acquire mastery of mobile devices, they saw such competency acquisition as crucial to working effectively in the mobile environment and to offering the sorts of services and assistance to students were increasingly expecting of them. Overwhelmingly, staff wanted access to mobile devices and time to experiment with them. They believed attitude was important, adaptability and a willingness to try things out, as well as the ability to link new technologies with opportunities.

Findings from using the UTAUT model revealed that longer-serving library staff were more likely to view positively the benefits mobile technologies would bring to their professional environment and were prepared to make the effort to learn new systems. Personal levels of competency with mobile devices did not appear to influence staff attitudes either in relation to the benefits to be gained from acquiring the necessary skills or to the effort required. The impact of position on technology acceptance indicated Library Managers placed greater emphasis on planning for technology impact while other staff positions realised the benefits of positively accepting mobile technologies.

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