

Micro-learning - A Way to Enhance Learning Pathways

By EM Nalaka S Edirisinghe & SankaraRajulu Sundara Rajulu

Abstract: In today's global work environment, technology is rapidly disrupting the old ways of doing business. This requires an approach to learning in the digitized economy that is equally rapid and helps the employees learn as they work in new emerging areas that may be critical to their roles and extending their careers. In response, micro-learning, using bite-sized content, was launched by the polytechnic to effectively help employees in different industries pick up new relevant skills quickly without the need to be physically on campus. This paper will discuss how micro-learning modules in the on-demand areas of cybersecurity and data analytics were designed using existing platforms and deployed to individuals to learn new skills. The paper will discuss the methodology adopted, the findings of participants who took part in the micro-learning modules, the pathways it created and how it influenced their learning.

Keywords: Mobile learning, technology, education, micro-learning.

Introduction

Technology continues to evolve at a faster pace than ever. This, in turn, requires organizations to respond accordingly to not merely survive in the global marketplace but actually thrive. Whilst corporate training has been the traditional response by organizations to upgrade the skills of their employees, this is no longer the only option for different reasons. One of the over-arching issues facing employees is the rapid depreciation of their skills as digitization impacts every sector of the economy. At the same time, the proliferation of mobile platforms and learning has ushered in a new era of micro-learning. Micro-learning is defined as learning in short-bursts through the use of any platform. For today's employees squeezed for time, micro-learning is a viable option especially if they need to pick up new skills in emerging areas. Two such emerging areas are cyber security and data analytics. With cyber security remaining a critical issue for systems throughout the world, it is more important than ever that every employee in an organization understands some of the issues behind it and how to prevent it. Likewise, with the explosion of data, organizations of all shapes and sizes need employees who can understand the data, make sense of it and provide predictions of things on the horizon. In addition, employees who face new portfolios in their organizations may be able to adopt micro-learning as a more cost effective way to learn on the go as they work on the new jobs. Thus, this paper intends to

look at how micro-learning has become an enabler for employees to chart their own learning pathways in today's dynamic workplace.

1. Literature Review

1.1 Micro-learning

Micro-learning is defined as learning that takes place over a short span of time. Typically this could be anywhere from 10 to 15 minutes. As such, micro-learning can be perceived in terms of the amount of time required to complete a certain task (Bruck et al., 2012). Micro-learning is not simply breaking down existing classroom content into shorter segments and putting them online. Instead, each segment should be self-contained with a specific objective. In addition, there should be different modes of assessments interspersed between these segments to reinforce the learning.

There are three key drivers enabling the push for micro-learning. The first is the need for flexibility. In today's climate learners are more empowered to drive their own learning in response to organizational needs and emerging areas. The second is cost-effectiveness. Learners and organizations both perceive that micro-learning is more suitable in terms of training costs as opposed to the traditional modes of intense classroom-based training. The third is the continuous disruption facing industries today. With the rapid pace of change it is imperative for training providers to push out shorter content quickly in response to industry demands. Micro-learning provides one such as avenue to do so.

1.2 Mobile Learning

Mobile devices today is the norm. Across every country, individuals have access to a wide variety of mobile devices. According to the Infocomm Media Development Authority of Singapore annual 2017 survey, the access rates for internet and broadband had increased to approximately 87% and 97% of the respondents highlighted the internet-enabled phone as the primary means of accessing the internet. With this high level of access emerges the demand for mobile learning. It is no longer necessary to sit in a classroom to learn specific types of theoretical or procedural content.

The need for mobile learning is perpetuated by a series of converging demands from consumers. The first is the need for on-the-go learning. This does not simply mean providing content but actually offering engaging, attention-grabbing multi-media content. The second is the need for on-demand access. This implies consumers want immediate access to their content anywhere and anytime. The third is the always-on nature of content. Consumers, today more than ever, desire curated, bit-sized content that can be provided continuously over longer periods of time.

1.3 Learning Pathways

A significant educational policy of many countries is for individuals to attain higher levels of education. This, in turn, would help them improve their quality of life and provide them the foundation to face any challenges. One solution for this is through the use of learning pathways. A learning pathway is defined as a sequence of educational programs that provide a specific path (Biemans et al., 2013). In addition, a learning pathway should be a continuum in a particular domain and last across several years. However, studies have shown that learners face challenges in moving across different pathways easily, resulting in

less successful careers and higher drop-out rates (Wheelahan, 2008). While many factors may be attributed to learners not being successful and dropping out across the different pathways, one cited is a possible mismatch in the learners' competencies with the learning pathways (Biemans et al., 2016). In addition, the way the learning content, itself, is aligned to help the learners go through the learning pathways may play a role in their eventual success (äppinen and Maunonen-Eskelinen, 2012).

However, there has been little studies done on using micro-learning on a mobile platform to formulate learning pathways. Therefore, this paper will look into the creation of micro-learning content for adult learners to facilitate the creation of learning pathways.

2. Background

Temasek Polytechnic is a tertiary institution with over 25 years of experience in conducting full-time and part-time diplomas for working adults and students. The School of Informatics & IT has been conducted multiple specialist diplomas and part-time diplomas for working adults in a host of areas, including cyber-security, data analytics, artificial intelligence and FinTech.

3. Subject

3.1 Rationale

In today's climate there are two areas of consistent interest and demand from working adults. These two areas are cyber-security and data analytics. For the purpose of this study, two modules related to these two areas were selected. The first module was an introduction into cyber-security. The second module was an introduction to social media analytics.

3.2 Micro-Learning Strategy

In developing the content the teaching team adopted a three principle micro-learning strategy. The first principle was to leverage on existing content platforms. For this study two content providers, namely Gnowbe and CoursePad, were adopted for different micro-learning content. The advantage of using these platforms was to leverage on their delivery and reporting mechanisms. By doing this, it helped the teaching team focus their efforts on producing the micro-learning content without have to deal with underlying infrastructure issues. The second principle was to develop a template for each segment of the micro-learning prior to beginning any development. The objective of the template included detailing areas such as key learning points and engagement activities to achieve the outcome. The third principle was to select and develop micro-learning content that would serve as the foundation for a potential learning pathway for adult learners. By incorporating this into the thinking process the teaching team could use the existing specialist diplomas as a base from which to decide the most suitable content for the micro-learning modules.

4. Methodology

As the project was a pilot study the methodology used was qualitative in nature. This pilot focused on the faculty and learner populations. The faculty population consisted of those teaching cyber-security and data analytics modules and the learner population consisted of anyone who signed up for the micro-learning content. The sample size consisted of two (2) faculty members and fifty (50) learners. The faculty members and students were selected

using simple random sampling. The instruments used in the study included the faculty members' journals, and feedback from the students. The micro-learning content was deployed over a period of three (3) months and all the data was collected at the end of this phase.

5. Results

The results of this study can be categorized into two areas: the learner perspective and the faculty perspectives.

5.1 Learner Perspective

In terms of the learner perspective, there were four key results. The first key result pertained to the level of interactivity provided. Learners highlighted that they found the bite-sized content useful and interactive. The second key result was that the micro-learning helped the learners optimize their time and allowed them to self-learn at their own pace. This finding was similar to previous research that indicated mobile learning helped make the learning process more "just-enough" and "just for me" (Peters, 2007). The third key result focused on the ease of learning. Learners appreciated that the micro-learning platform was easy to navigate and learn from. They highlighted that the content was pitched at the proper level to ease their learning. The fourth key finding was that learners found the micro-learning a potential pathway for them to learn the fundamentals of an emerging area without the need to enroll in formal training. They also highlighted that they could use the micro-learning as some form of credit to formulate their own learning pathway into a specialist diploma. Thus, micro-learning could be a potential first-level programme for a learning pathway, whereby learners complete the bite-sized content and use that to apply for a one-year specialist diploma in the same domain area, such as cyber-security or data analytics.

5.2 Faculty Perspectives

In terms of faculty perspectives, two key results were noted. The first key result was that the participation rate for micro-learning was quite high as a result of the availability of bite-sized content. The second key result was that the teaching team observed the micro-learning content as a suitable mechanism by which to introduce content in a domain, such as cyber-security or data analytics, to a wide audience, without asking for the commitment of taking a year-long specialist diploma. The teaching team felt this made it more attractive to the adult learners to try out a new domain with minimal risk.

6. Discussion

While the study did show some promising results there were a few limitations to take note of. The first limitation was that the learners' background involved a mix of public and corporates. The second limitation was that the micro-learning content created was focused on key in-demand areas today in the technology space. As such, the findings may not be generalizable to all domains. In response, areas for further research include to replicate the study with a bigger sample size as well as with non-technical domain content.

7. Conclusion

In conclusion, this pilot study potentially suggests micro-learning content on mobile platforms can help adult learners create a learning pathway that they can follow.

References

- Biemans, H. J. A., De Bruijn, E., Den Boer, P. R., & Teurlings, C. C. J. (2013). Differences in design format and powerful learning environment characteristics of continuing pathways in vocational education as related to student performance and satisfaction. *Journal of Vocational Education and Training*, 65(1), 108–126.
- Biemans, H., Mariën, H., Fleur, E., Tobi, H., Nieuwenhuis, L., & Runhaar, P. (2016). Students' Learning Performance and Transitions in Different Learning Pathways to Higher Vocational Education. *Vocations and Learning*, 9(3), 315–332.
- Bruck, P.A., Motiwalla, L. & Foerster, F. (2012). Mobile learning with micro-content: A framework and evaluation', Proceeding of BLED, 2012, <http://aisel.aisnet.org/bled2012/2>.
- Infocomm Media Development Authority (2017). Annual survey of Infocomm usage in households and by individuals for 2017: Singapore.
- Jäppinen, A.-K., & Maunonen-Eskelinen, I. (2012). Organisational transition challenges in the Finnish vocational education – Perspective of distributed pedagogical leadership. *Educational Studies*, 38(1), 39–50.
- Peters, K. (2007). m-Learning: Positioning educators for a mobile, connected future. *International Journal Of Research in Open and Distance Learning*, 8(2), 1-17.
- Wheelahan, L. (2008). Neither fish nor fowl: The contradiction at the heart of Australian tertiary education. *Journal of Access Policy and Practice*, 5(2), 133–152.