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Personalising Student Learning Through Education Technology

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"The illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn." This quotation, from Alvin Toffler's classic book Future Shock, is arguably more relevant today than when it was written in 1970. Today's learners face a rapidly evolving workforce that demands cutting edge technical skills, skills that increasingly reach obsolescence just as employees become comfortable using them. Keeping up with the exponentially increasing amount of technical information requires lifelong learning from primary school, to secondary school, university, and then throughout a working career. A 2012 Australian Bureau of Statistics report[1] found that 57 per cent of older students already had a Bachelor Degree, and 40 per cent were working full-time and studying part-time. Yet students who commit to a traditional Bachelor Degree at a university often find that over half of what they learn in their first year of study is already outdated by their third year. Graduates are increasingly being driven to reskill within the confines of a busy working life and career.

There is a growing push within schools and universities to meet changing student and workforce needs by reorganising degree programs into more flexible and personalised courses. Currently, students choose from a pre-established menu. In both high school and university, there is some choice and tailoring through electives, but this is not enough. In university, students choose a degree (course) and complete the required subjects with some electives. Some universities offer double degrees that allow limited elements of flexible career planning. For example, a university student preparing for a career as a Digital Designer in a multi-national corporation will need to take subjects in computer science, desktop publishing, project management, communications, international relations, and marketing. In the current state-of-affairs, the university

student will need to choose a degree in one or possibly two of these areas, with a few single-subject electives. The graduate will have learning/training gaps and will have enrolled in a number of subjects that may not match his/her career plan.

The current education design is the metaphoric equivalent of going to a restaurant and choosing Menu A, B or C with fixed entrées, mains and desserts. There is no mix and match, substitutions, re-combinations or accommodation for dietary needs. The new vision is the equivalent of a buffet. There are numerous varied dishes which may be combined according to the diner's wants and needs.

The subjects within these new degrees must be skill- and outcome-based, practical and engaging. Curriculum combined with pedagogy will develop student pathways quickly and efficiently. In the near future, schools and universities will need to evaluate a student's current competencies, the attributes required for career advancement, and address the resulting gap with a personalised program.

Personalising Courses Using Agile Learning Design

Educational design teams at the secondary and university level have achieved successes in developing flexible personalised learning solutions through Agile Learning Design (ALD). ALD is defined as an iterative process that is faster and more flexible than traditional instructional design approaches. Each phase is run as a 'sprint': a short, rapidly developed, iterative process which is repeated over and over in a cycle. These sprints allow the course designer to be much more interactive with the Subject Matter Experts (SME) and students with respect to suggestions, modifications, and other feedback. As this information is reviewed and issues arise, minor changes can be readily made to the curriculum without the costly and time-consuming

course overhaul that a traditional approach would require.

The first iteration of an ALD process is enough to cover the course if necessary. However, ongoing refinement allows for changes to be quickly implemented as needed. For example, in a situation where a course on Human Genetic Engineering is being developed, a sprint deadline of two weeks could be used to write the outcomes and objectives. Throughout development, ideas are shared in fast brainstorming sessions, emails, mind maps, and other discussions. By the end of the week, decisions are made on what the learning objectives will be so that the next phase of the process can begin. At a later date, these can be revisited and modified, so that customer service and communication skills could be added to the program.
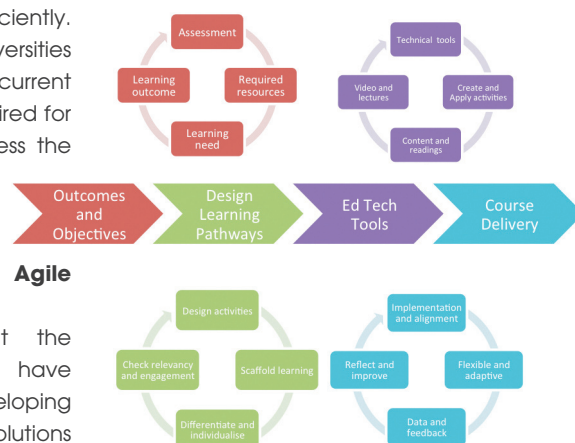
Figure 1: The Agile Learning Design Process. Adapted and provided with permission by Marian Willeke – Agile Curriculum Development Model[2]

Developing Learning Outcomes
The process begins with the course design team considering and reflecting on the students' needs and developing learning outcomes: the knowledge, skills, attitudes and attributes that students will take with them from a program. These decisions influence the assessment that

will demonstrate whether a student has attained these outcomes.

At this phase it is critical to consider how a course will assist students to prepare themselves for the workforce. Increasingly, top students are finding the employment outcomes of their studies are not guaranteed, so employability skills and co-curricular must be a learning outcome for all institutions designing individualised programs. Equipping students with the skills needed to achieve their career goals is the focus of Beyond Bond, a program developed at Bond University which explicitly embeds employability and professional skills as a required learning outcome in all undergraduate degrees. From their first semester on campus, students engage with staff to personalise a developmental approach to graduating with a strong employability profile. Within this program, the learning experiences include student employment, community engagement, personal development and the creation of ePortfolios. Through strong connections with industry, the Beyond Bond program plans, reviews and guides students through employability activities, building industry relationships that foster the mutual aim of increasing graduate employability.

Learning Pathways

A learning pathway is a collection of activities and experiences that create opportunities for students to learn. This phase is focussed on planning how activities can scaffold, create engagement and support an individualised learning experience. It is preferable to link theory to practical approaches, as this builds learner confidence, autonomy and relevance to the real world. After the learning activities are designed, they are assessed for student engagement and alignment to outcomes. In an agile approach, the first iteration of this phase may rely on a single linear learning path and, in subsequent iterations, more unique and personalised activities may be added.

Education Technology Tools

During this phase, the focus changes from planning to building and curating the actual activities and learning experiences that will make up the course using appropriate technology tools.

With the accessibility of faster broadband speeds, students are now able to take advantage of more dynamic, interactive multimedia content enriching their learning experiences. Streaming high definition video allows academics to present subject matter in visually appealing ways to an audience of students. Online videos and interactive content also facilitate a 'flipping the classroom' approach and tailor a better learning experience for students with diverse learning needs.

Online training providers offer thousands of instructional videos and interactive experiences on a variety of subjects. Institutional access to these types of online learning platforms (e.g. Lynda.com) through site-wide licences allows academic development teams to quickly incorporate professionally made content into existing curriculums without the need to reinvent the wheel.

Course Delivery

The final phase of agile learning design is the implementation of the course and delivery. This could involve publishing the course to a Learning Management System (LMS), presenting face-to-face workshops and lectures or online community discussions using synchronous or asynchronous eLearning tools. There are a wide range of technologies to support active student learning experiences, including backchannels and student response systems.

A critical consideration during the delivery phase is how to reflect on and improve course delivery and student outcomes. Through the use of analytics tools, student data and feedback can be quickly analysed so that problems with course delivery can be addressed in a timely fashion.

Tips for Applying Agile Learning Design

DO	DON'T
Start with learning outcomes and objectives.	Start with resources and content.
Embed and explicitly teach student employability skills.	Suggest students make a resume at the end of their study program.
Create a list of useful technology tools.	Use complex, difficult to learn software.
Use interactivity and provide more than one pathway through content.	Use a strictly linear approach to course content design.
Revisit course outcomes, content and learning pathways as needed.	Use a 'set it and forget it' approach to curriculum design.
Chunk content into short (7-15 minute) videos.	Re-create long lecture style videos online.
Enable videos to be reused by avoiding course-specific information.	Add video heads, names, dates and mention current events in videos.
Create engaging presentations using appropriate images, videos and real world examples.	Read PowerPoint bullet points to students ad nauseam.
Make efficient use of valuable face-to-face time through engaging group activities that build on online content.	Limit group work during face-to-face time and replicate long lecture presentations online.
Harness the analytics and feedback mechanisms of software.	Request feedback only at the end of the semester.

A Way Forward

As the rate of disruptive change in education continues to increase, it is critical that schools and universities adapt to changing student expectations. Integrating the ALD process with a range of suitable technology solutions allows institutions to rapidly develop personalised pathways. Learning outcomes and objectives inform the design and development phases and there are continual opportunities for student and SME feedback to influence decisions. Because iterative changes are possible, schools and universities can adapt, improving graduate employability by building a personalised learning pathway for every student that addresses student expectations and the evolving needs of the workforce. **ETS**

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