

Emphasising personalisation movements in contemporary management education: the impact on learning environments

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Abstract

Initial research in this project looked at opportunities for personalisation in specific degrees within the authors' immediate remit. This led to the elaboration of initial 'colours' of personalisation and an awareness of the logistic and economic solutions, and challenges, that these approaches could bring to teaching. From this, a 'palette' was elaborated to offer the basis of a set of design principles that could be adopted more widely to produce new personalised material.

However, some of the new or enhanced features in Moodle 2.4 began to change our thinking about what we could achieve, moving beyond Moodle as merely technical support for what we currently do. Instead, we are focussing on how Moodle 2 allows us to develop and refine our educational practice so that we start doing things that were just not possible before, to support excellent student learning.

The current next stage of this research now aims to look beyond single courses to build references and models for staff to approach personalisation, to provide a more tailored, more responsive, and more independent learning experience for students. Further work is underway to trial new methods of student input, independent learning, and staff feedback, with analysis of performance for any good practice emerging. The outcomes from these activities will then be structured, formalised, and simplified to bring personalisation to more courses, raising the bar for student education throughout the Business school.

Keywords

Moodle, Moodle 2.4, personalisation, conditional release, student-informed design

Introduction

This note discusses an evolving set of principles for the incorporation of personalisation into learning materials at a business school. It is a response to the availability of innovative learning environments that broaden the scope for educational materials, delivered electronically, to be tailored to a particular student's requirements. In the case of the authors' institution, an important driver is the move to Moodle 2, which offers a range of features such as conditional release, quizzes with shared variables, and more opportunities for feedback. However the principles and taxonomy discussed here are not specific to institutions using Moodle, or indeed to those using any sort of conventional virtual learning environment (or VLE).

As Zuboff (1988) indicated, automation - the conversion of the physical to the digital - tends not to be the origin of breakthrough innovations. She argued for "informating", essentially increasing the value of the information and knowledge through digitisation. Historically an element of personalisation has been provided within the authors' institution, at both undergraduate and postgraduate levels, by the provision of a range of elective subjects. In terms of curriculum design, this is not a risky method, but it does mean that the ability to include certain subjects can be precarious if they are not chosen by enough students to justify offering them. The expectations that students currently have in terms of products and services being personalised are closer to those associated with the long tail (Hintz et al, 2011) with the implication that the combination of a large number of tailored products can satisfy a large proportion of a market. This is even when each individual variant of the product is only supplied in very small numbers. Istance (2011) regards provision of 'deep personalisation' as a key characteristic of future learning environments.

Dabbagh and Kitsantas (2012) engage with the rhetoric on personal learning environments – proposed by some as an alternative to classic VLEs such as Moodle, but also draw useful connections between personalisation and the conjunction of formal and informal learning. Crucially, they refer to the idea of students as learners who are capable of self-regulation, and who should be encouraged to find their own paths through the pedagogic resources made available to them.

This paper focuses explicitly on attempts to move away from the traditional mass monolithic classroom, whether physical or digital, and instead to seek out more applications of "informating" in higher education. Our specific focus is with business and management education at undergraduate and postgraduate levels, but we expect much of our approach to be relevant across a wide range of disciplines, not least in areas concerned with developing professionals. Even in "hard" disciplines such as medicine and engineering, even though the science involved may follow laws and principles which are either correct or incorrect, the application of that science to practice involves a wide range of human and social issues which cannot be reduced to formulae, which are contingent on circumstances and perhaps even to the individual professional and the client/patient involved.

We are therefore looking ahead to build references and models for staff to approach personalisation more easily, to make it an effective tool to provide a more tailored, more responsive, and more independent, learning experience for students. Further research will therefore involve trialling new methods of student input, staff feedback, and independent learning, and attempting to analyse and identify any good practice - or mistakes to be avoided. The outcomes from these activities will then be structured, formalised and simplified to bring personalisation to more courses, raising the bar for student education throughout the authors' institution.

Personalisation movements

Two approaches to personalisation were initially considered:

1. One Goal, Many paths

One form of personalisation aims through many paths, to bring students to a common goal. This is often a response to problems arising from the increased diversity in incoming students' capabilities and styles, relative to key core modules. Lecturers are confronted, predominantly within undergraduate cohorts, to sharp degrees of variation, and the question is of how large group delivery methods can realistically take account of this.

For instance, in the undergraduate courses studied by the authors, the first year is already structured to provide an element of different content to students with different levels of prior knowledge. This method, offers for example, a much more comprehensive introduction to mathematics and statistics for those who do not study these subjects at A-level or equivalent, and can be summarised as 'tailoring for a whole cohort.'

Feedback from undergraduate students has indicated that there would be interest in providing material in a range of subjects that is more closely tailored to individuals' prior abilities. This is an example of using personalisation to reduce the diversity of the cohort, by taking in a group of students with varied attitudes, expectations, knowledge, and skills, and ensuring that all members of the cohort have similar knowledge in common core subjects.

2. Many Goals, One path

One may also have a cohort incorporating many students, all with specialist experience and goals, but who follow one path or process. This perspective aims to address the tension implicit in teaching a group of students with high-value but diverse experience, aims, and interests, and who must nevertheless somehow finish with a similar level of skills or outcomes: for example, in the quality of a final year project in a chosen area.

This is the most often linked to postgraduate education: where students do not need to have the same subject material, research or skills to move through the course, although they follow a similar process and aim for excellence. This view brings together students who may already have gone through a learning journey, who have the basics of knowledge they need, but wish to round off experience-based skills or a previously generalised education. This could be through further specialised 'interest-based modules' to complete gaps in

skill-sets, or through a deepening of understanding in one very specific area – which sometimes leads to “narrow and small” personalisation (narrow interest, small group.)

MBA and ‘executive education’ students embark on their studies with already significant and valuable business experience, sometimes making the ‘sage on the stage’ approach to teaching reasonably difficult. In cases like these, which demand more flexibility and student-focus, there is a strong connection to personalisation in the potential for collaboration and co-creation of content with students in niche areas. This is an example of using personalisation to increase the diversity of the cohort, by encouraging niche skills and areas of knowledge.

A clear distinction?

Each of these approaches has its own strengths, limitations, challenges, and opportunities. In the case of bringing students to a common goal, the practical, economic, and logistic ramifications of personalising content can strongly affect the viability of such an approach. In the case of the authors, personalising mathematics and statistics provision in the first year reinforced this. This experience of personalisation had proved successful partly because the subject was taught in the same way across a range of business, management, and finance degree courses. There were enough participants to make it feasible to run face-to-face tutorial sessions with a large number of small groups, based on students who shared a comparable background. However, this could only be achieved by setting aside a significant amount of time each week for the subject, and to replicate this same tutorial pattern in a different subject would have created insurmountable problems in timetabling.

By contrast, the development of specialist interest modules to allow the pursuit of different goals at the same level, also bring its own logistical complications. The authors have observed that, on occasion, subjects that started as areas of specialist interest attract more students and grow into popular elective choices. Within the authors’ institution, this appeared with an elective option on arts markets, originally identified by a small number of students as a possible area of interest, which has now become a popular choice for final year students.

The area of Digital Enterprise seems to hold particular possibilities for innovation in this kind of personalisation, in part due to growing interest from the initiatives relating to the creation of a cluster of high-technology businesses in one urban zone near the authors’ institution. One illustrative radical idea for postgraduate personalisation, proposed as early as 2003, was the “one hour, one student” module. This was much less feasible in 2003 than it is in 2013, which has improved technologies.

New technologies allow us to support increasing amounts of personalisation in many ways. They provide a much wider range of formats for presenting learning materials, and these formats have become increasingly acceptable to students as the use of online technology becomes more widespread and more embedded in peoples’ lives as a whole. Moreover there is an increasing amount of content on the web, and much more collective willingness to co-create this material. In this way, an educator wanting to put together material on something specialised has access to a very wide range of resources, and could also crowd-source the navigation and classification of these resources to an extent which would have been difficult in 2003.

Learning analytics are also an important facet of this movement, encouraging and stimulating personalisation. Moodle’s intrinsic logging of staff and student activity allows, with certain provisions, to know what subjects they are exploring and which subjects need further development. Work at the University of Luxembourg (Coronado, and Zampunieris, 2010) has led to the development of “proactive” learning capabilities through Moodle plugins.

Consideration of these issues can help us focus on experiences that would be best for learning from the learner’s point of view, rather than just delivering and assessing material the lecturer thinks the learner needs to know. Changing perspective, from lecturer as ‘the source of knowledge’ to influencer and role model of class culture, can help unlock the potential for each participant to become a teacher as well as a learner.

The initial assumption was that the first category (1GMP) would be most appropriate for undergraduates and the second (MG1P) most appropriate for postgraduates, such as MBA and Executive Education students because they already have diverse interests, often formed by external influences which were in place before they

embarked on their studies. However, this is not an exclusive case as a student's interest in a specialist area could well be piqued by their experiences while studying their core courses. It rapidly became apparent from discussions with course directors, in particular, that opportunities existed to put both categories into practice across the range of undergraduate and postgraduate courses.

Colours and tones of personalisation

During the course of these discussions we found new facets to these approaches, which we began to see as colours and tones of personalisation, through which staff and students may begin to paint a collaborative picture.

Colours for customisation

For this project an initial range of different 'colours' of personalisation were identified:

Diagnostic personalisation	Multi-format customisation	Visual customisation	Student-led customisation	Unpersonalised

Figure 1: Customisation colours

- *Diagnostic personalisation* refers to the provision of very specific, tailored, or specialised content that is appropriate for a particular learner's requirements. This could take the form of a diagnostic test which might unlock content, or point towards a learning path for certain scores/choices. Self-selection might also prove a useful way to encourage users to effect a self-diagnostic test, and reflect on their needs and aims.
- *Multi-format personalisation* refers to keeping the same content, but delivering it in ways which suit an individual learner's preferred learning style, or other aspects of their preference. So this kind of stylistic personalisation would offer, for example, the option to deliver content in more or less visual forms. For example, according to whether the content was being read by somebody with a preference for visual learning. Multi-format customisation could extend to the ability to translate content into different languages, and to deliver it through different electronic channels – for instance either through a web browser or an app on a mobile device.
- *Visual customisation* refers to relatively minor changes, such as choosing the colour scheme or detailed layout for course material available electronically. While leaving the content and method of delivery unaltered, this can still be important to give students a sense of agency and ownership in their learning environment.
- *Student-led customisation* refers to the embedding of points and mechanisms for feedback/dialogue into the course, leading to changes in course delivery. Methods and models such as Laurillard's conversational framework may be of interest to identifying the sort of personalisation needed.
- *Unpersonalised* refers to completely standardised course materials and delivery.

Tonal variants

Each different personalisation 'colour' can be extended or combined to bring new synergies. Three more underlying aspects, relating to methods of input, also emerged after further review. These 'tones,' intended to lie on a continuum, can be used to modify the properties and effects of the 'colours' above:

- *Pre-set tailoring* entails the materialising of these approaches through the setup of autonomous activities that require little, or no further, input from the lecturer to offer some learning benefit to students. The initial investment of staff time required may however be considerable, especially in terms of planning and embedding detailed feedback. Nevertheless, this must be evaluated against, and sometimes be outweighed by, the longevity and total value for independent student learning. Examples of this might be an activity such as a formative quiz in a VLE – such as Moodle - or even an intellectual method for approaching a certain kind of common problem.
- *Real time tailoring* entails rapid customisation based on 'live' or 'real-time' student activity or feedback. This requires active and immediate feedback on the part of the lecturer, which could be

based on live polling data, student questions, or usage statistics. This does hold some similarities to the efforts of those leading a seminar by dialogue. By nature, delivering highly tailored feedback does not necessarily facilitate independent learning through personalisation. However, it does complement these activities as an important part of student touch-point mechanisms for interaction with the tutor, as well as a fact-checking safety net for all. Lastly, while these are things that can be supported using technology, the core of these activities cannot be done by machine, reminding us of the value of the teacher. Examples of this could be tailoring a class or webinar based on in-session polling, or asking students to find and share useful supplementary resources at key points in session.

- *Delayed Data tailoring* involves analysing data or feedback from student activity and tailoring delivery or content based on this, but at a later date. This serves to enhance and extend the value of the activity of all participants in the course, including the results of independent or group learning, or student feedback exercises. Through setting points for review, this allows specifically tailoring content and delivery to the needs of a particular cohort or group. This also allows the possibility for iterative improvement in the longer term, as it allows time and focus for personalisation to be further researched or implemented. Examples might be finding more resources for weaker subjects as highlighted by class quiz results, or using feedback from last year's cohort to improve course design and delivery.

The factors illustrated by the colours and tones could also be represented by a matrix, although this is limited because of the need to show it in only two dimensions:

	Diagnostic personalisation	Multi-format customisation	Visual customisation	Student-led customisation	Unpersonalised
Preset tailoring					
Real-time tailoring					
Delayed data tailoring					

Figure 2: Tonal matrix

A palette for personalisation

These colours of personalisation can then be aligned against these three tones to produce a ‘palette’ for course development and a matrix for reference. The palette is useful as a tool for identifying possibilities where personalisation could be implemented, by supplementing the baseline of teaching and learning with other approaches. It can also be used to identify opportunities for change.

Our ongoing research in this project seeks to build on this for a more practical outcome, to produce a new palette of possible activities and structures from which educators could draw ideas, most likely inspired from the popular Moodle Tool Guide produced by Joyce Seitzinger (2010).

Stages/Frame of reference

In our experiences and reflections on the application of personalisation within a course, three possible stages emerged as likely to provide a framework of reference for applying a chosen palette of personalisation. While these are neither obligatory nor conclusive as a list, they seem to consolidate some of the processes we felt were important for students to experience as part of personalised learning. Much like different stages of a painting, like an underlay - blocking out large areas of colour and filling in details, - all of these steps should contribute to painting a successful picture, helping students to get the most out of their learning:

- *Self-diagnosis*: Allows the student to reflect on where they think their strengths and weaknesses might be. Important for the student's self-development, this stage generally falls within the early stages of the learning cycle, but could repeat itself throughout the student's learning journey.
- *Normative/objective assessment*: This form of 'objective' assessment serves as a point of comparison with self-review by the student, and may provide a normative aspect by showing them expectations for their progression. This can also be key in terms of fact-checking and re-evaluation, after work in the Self-diagnosis stage.
- *Student-led/Community of practice*: An important stage that allows students to engage with course material both as active learners and contributors. This can be a great way to build a sense of true ownership, and reinforce the idea of student learning as an act within a community of passionate and professional individuals. The concept of communities of practice is well established in higher education and forms the basis for the creation of communities of inquiry, where educators and learners work together (Swan et al, 2009) to create a body of knowledge.

Each of these stages can include, or be fulfilled, by a mix of different 'colours' of personalisation or 'tonal' variants, described in the section above. Applying colours and tones to these stages gives educators the possibility of elaborating a tailored menu of personalisation for their course, to be then implemented through activities or resources. We will also be looking, as we continue to explore personalisation within our research, to see if any more stages emerge or if similar frameworks could be incorporated.

Romero et al (2008) discuss a case in which data generated by Moodle is mined to provide a better understanding of students' needs. This introduces an interesting possibility that can be overlaid on the palette, that personalisation can be driven either by students' conscious choices (which may be guided by material available online) or by an automated process within which the best way to meet their preferences can be determined. Historically the term "adaptive learning" has been associated with the provision of an open set of resources through which students can navigate in response to their experiences (Trigwell and Ashwin, 2006) but increasingly it is used to refer to the application of learning analytics (Ferguson, 2012) to build deep and complex models of students' behaviour.

Next steps

Initial research in this project looked at opportunities for personalisation in specific degrees within the authors' immediate remit. This led to the elaboration of initial 'colours' of personalisation and to an awareness of the logistic and economic solutions, and challenges, that these approaches could bring to teaching.

The palette elaborated also offers the basis of a set of design principles that could be adopted in producing new personalised material more generally. A key objective of the personalisation project around which this paper is based, was to create a set of design principles, based around instances where personalisation can enhance existing courses. This is informed by Laurillard's (2012) concept of teaching as a design science.

For instance, sometimes combining unpersonalised learning with a personalised learning approach through specialised electives proved unfeasible, because of limited student numbers. In such cases, there may be scope to introduce both personalised learning journeys and specialised material, by inviting students to choose areas of interest, and work with staff to develop learning resources. In cases where there are deficiencies within the ability of students to follow the 1GMP learning journey, there is also scope for supplementing the baseline materials. For example in subjects such as economics, where one challenge for students is to become confident with the terminology used, there are particular attractions in offering 'diagnostic personalisation,' which steers students towards material tailored to their background or current ability, with which they can better engage with.

Initial discussion around the possibilities for personalisation began between three core Academic staff teaching collaboratively, who were then supported by the School's Educational Technology team to implement desired changes. Through this process we began reflecting on the fact that Moodle is used by many to support technology-disconnected approaches elaborated prior to online implementation; making it merely a technical support for what they have previously done or currently do. From these thoughts emerged a determination to push our own use of Moodle beyond a secondary medium and move towards a more proactive and innovative

use of technology. Our ultimate goal is to use Moodle 2 to develop and refine our educational practices, and start doing things that were just not possible before to support excellent student learning.

Some of the new technical capabilities, which have expanded our ideas of what we could achieve, have simply come from the increasing variety and maturity of the technical systems available. Conditional release of activities and content in Moodle 2 allows us to create a guiding flow through the material based on grade or choice, giving students the ability to navigate through content using personal preferences and individual performance ratings. Quizzes have also been improved with new question types but also, most importantly and long awaited in the authors' institution, shared synchronised variables in calculated questions. These now allow us to build more realistic, but also less easily 'gamed' scenarios, with questions and answers shuffled - the same problem, but maybe not always framed in the same context/question.

This has meant more involvement from the Educational Technology team, initially reviewing a pilot course, and suggesting useful Moodle 2.4 features and approaches already in use elsewhere. Following this, Educational Technologists and Academic staff met monthly during development time to continue to exchange ideas and confirm desired developments. We have also had the benefit of a keen Student from the previous year to offer feedback and advise on the student perspective, and this has grown the idea that increasing student input and agency into the course would be of great benefit to all (see below). During the course of research several other factors also emerged to alter our thinking, and this changed what we could see as possibilities for further work.

Equal access and the group as a whole

Conversations with other student-facing services also highlighted the importance of, in terms of equal opportunities, all students having access to all resources. This provides a certain creative tension in regards to personalisation, which makes creating pathways through a broad landscape of material now even more crucial than building in silos into which students are slotted.

We will also be looking at setting key points within the course lifecycle for the lecturer to give feedback to the cohort, possibly based around diagnostic quiz results for the class as a whole. This 'tailoring for a cohort' is an easily forgotten aspect of personalisation, which naturally might be seen to revolve around the individual only. One can view the whole exercise of personalisation as a way of acknowledging the personal nature of each student and each teacher's learning journey. However, then there is also an implicit natural opportunity to form a community of practice and learning, by coming back together as a group to reflect, share, and contextualise these experiences too. Hence webinars, contact points, feedback, and lectures are therefore all a key part of the personalisation process. We are also keen to pull out more data from activity on courses as 'learning analytics,' to highlight points for review, changes, or improvements in delivery and student performance/satisfaction.

Extending student ownership/input

A common comment from students is that they "don't know what [they] don't know." It is hoped that some of the opportunities for self-diagnosis and objective assessment provide a chance for students to find out what they 'don't know' within a 'safe' environment. It is also key that students and staff see personalisation as a tool for getting more benefit out of face-to-face time, not just 'offloading' teaching. Personalisation therefore does not necessarily aim for students to entirely 'teach themselves,' but feel supported and guided towards thinking about their learning, and being independent learners.

Our current idea for the coming year is to invite students onto the Foundations of Economics Revision Booster course, and ask them to feedback on current design and future plans. This should prove a (possibly brutal) insight into student perception and preferences, but is important both in terms of students seeing themselves as active collaborators, and in giving us material for improvement based on student led informed design. Looking ahead, an additional possibility is to also have some of these students acting as facilitators or moderators in the course for the next academic year. This might involve changing permission regarding the student role, enabling students to take fuller control of the course and giving 'limited freedom' within the walled garden.

Concluding remarks

Our current phase of research therefore aims to look beyond a single course to build references and models for staff to approach personalisation more easily, making it an effective tool to provide a more tailored, more responsive, and more independent learning experience for students. We want to give lecturers and students the materials, the colours, the tones and the stages to feel empowered, and allow them to paint their own vision of learning.

We believe that technology can act as an enhancer for the personal and unique aspects of learning, rather than as a one-size-fits-all learning experience. We look forward to these collaborative experiments with students, and to sharing the results with the wider community.

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