

Meeting some challenges of learner diversity by applying modal preference and learning needs to adult learning

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Abstract

Learners' needs have always been a factor that university teachers should take into account when designing or delivering subject matter. In this paper, some design and delivery strategies are outlined and preliminary assessments of their effectiveness are made. The strategies focus upon the feasible implementation of sound pedagogical and andragogical principles within a framework of modal preference and adult learning needs. The authors did not implement identical strategies in their respective subjects, but had a common objective: to improve learning and assessment outcomes by recognising the different learning needs of different students.

Introduction

Since the Dawkins changes to the Australian Higher Education sector in the 1980s, and the subsequent massification of tertiary education, learner diversity has become an imposed circumstance that tertiary educators strive to confront in the design and delivery of their academic programs. The context of learner diversity that underpins this paper relates to three specific areas – diversity in the context of multiple delivery modes (internal/day, external/distance, and online); diversity of student discipline backgrounds; and diversity of student cultural backgrounds – including work experiences.

The genesis of this paper was in 'chewing the fat' after meetings of the academic Appeals Committee in a Faculty of Business at a regional Australian University. Often, the topic of conversation turned to principles of learning as consideration was being given to students who seemed to be totally bewildered by their failure after (apparently) having worked diligently through the semester. Could learner diversity be the 'real' problem? and could more careful design and delivery of subject matter make a contribution to its resolution?

This paper focuses on how two lecturers made a commitment to experiment in design and delivery of learning resources for business students, based on the lecturer's understanding of the needs of adult learners and the role of modal preferences in learning.

In the context of this paper 'adult learners' are assumed to be all learners enrolled in tertiary education courses. The strategies discussed focus upon the feasible implementation of sound pedagogical and andragogical principles. There is no attempt to prescribe best practice. Indeed, the strategies implemented by each lecturer vary considerably. Nor is there any attempt to critique teaching and learning theory in the light of experience - that must come after a longer period of experimentation and reflection. Instead, this paper focuses upon how

the lecturers have set about achieving their common objective to improve the educational experience and assessment outcomes of business students by recognising the different learning needs of different students.

The paper outlines and assesses the strategies adopted in two subjects – economics and human resource development and provides some tentative conclusions. These conclusions relate to how a modal learning approach, when applied to adult learning needs, may reduce business economic student failure rates. They also relate to how modal learning principles may be applied to adult learning needs when preparing study materials for human resource development distance education business students.

Addressing adult learning needs using a modal preference approach

Background

The subject under consideration is a second year macroeconomic theory subject (Macroeconomics for Business and Government) with a typical enrolment of 70-100 on-campus students and 150-200 distance education students. The typical failure rate prior to 1997 was in the 20-25 percent range, but in 1997 the failure rate increased dramatically to nearly 38 percent. Part of the reason for this was a lowering of entry standards in 1996, but it was difficult to believe that this was the only reason. Could it be that, with increasing enrolments and lowering of entrance standards, there was a greater diversity among student learners?

An analysis of students in the class of 1999 revealed much diversity among the students. Because Macroeconomics for Business and Government is a second year semester-long subject in macroeconomic theory and policy, students must first pass the prerequisite introductory economics subject. For students enrolled in majors other than economics, Macroeconomics for Business and Government is the second economics subject in their degree (for economics majors it is the third).

In 1999 there were 175 students in the subject. Of the 175 students, 24 percent were day students who attended lectures and tutorials on campus. Most internal students had come into university from high school without having ever been in full-time employment. The remainder were external (distance) students. About half the external students were overseas, mainly Malaysia and Singapore. Most of the Australian external students were mature age and were currently in paid employment.

Within the class there were students enrolled in four different degrees—Baccalaureate degrees in Business, Commerce, General Studies and Information Technology. However, 80 percent of students were in the Commerce degree, with a further 15 percent in the Business degree. For the overwhelming majority of students (94 percent), Macroeconomics for Business and Government was a compulsory subject.

One curious aspect about the class was the huge diversity in terms of the number of remaining credit points in degrees. If students followed the recommended pattern of enrolment, they would have completed 12 credit points upon passing this subject and have 12 credit points to complete. In fact, only 7 percent of students were in this position - 27 percent had more than 12 credit points to complete (often because they had failed one or more subjects) and 59 percent had fewer than 12 credit points to complete. This reflects the diversity of the pattern of enrolment of students. Many are unable to follow the

recommended enrolment pattern because they need to reduce their workload in some semesters, or because they fail one or more subjects.

This background motivated the lecturer to explore the possibility of using the literature on learning styles as a basis for design and delivery of the subject in to cater for the diversity among students and to impact on reducing the failure rate. Implicit in this was the hypothesis that student outcomes described above were at least loosely associated with diversity of learning styles.

Learning styles and modal preferences

Individuals process information and learn in different ways. These different ways are referred to as learning styles. Broadly speaking, learning styles have been classified in four different ways. These are: preference for sensory modality, typically classified as visual, auditory and kinaesthetic (Rose, 1985); left brain/right brain dominance (Herrman, 1990); information processing style, typically classified as concrete-reflective, abstract-reflective, abstract-active and concrete-active (Kolb, 1984); and personal style, typically classified as extraverts/introverts, sensors/intuitors, thinkers/feelers and judges/perceivers (Lawrence, 1994). Fleming and Mills (1992) suggested that modal preference is a dimension of learning style that has some pre-eminence over others. They argued that this brought the focus to the preferences that students have for intaking, and outputting information. From the literature on neuro-linguistic programming and split-brain research they took the visual, aural and kinaesthetic modes and added what they called a read/write mode. Their modes are defined as follows:

- Visual—preference for graphic and symbolic ways of representing information;
- Aural—preference for ‘hearing’ and ‘talking’ information;
- Read/Write—preference for information in the form of written words; and
- Kinaesthetic—preference for information in the form of experience and practice (real or simulated).

Over a period of some 15 years Neil Fleming (together more recently with Charles Bonwell) has developed a package that consists of a short questionnaire and appropriate strategies for both students and teachers (Fleming, n.d.). In 1997 on-campus students completed the questionnaire and the results showed diversity of modal preference among students. For 40 percent of respondents there was clear dominance of one mode, with the other 60 percent of students being bi-modal or multi-modal. Furthermore, after statistical analysis of the final examination it appeared there was a significant (and positive) correlation between students’ read/write scores and their marks. This knowledge led to a total re-design of the subject.

Principles underlying re-design of Macroeconomics for Business and Government

The principles underlying the re-design of Macroeconomics for Business and Government were simple: clarity, consistency, and recognition of modal preferences. Clarity was achieved by writing a detailed study book using simple, conversational and sticking as much as possible to short sentences, one idea in each sentence, and one argument in each paragraph. Consistency was achieved by presenting each major topic area in the same format. Recognition of modal preferences was achieved by presenting information in a variety of ways and choosing a textbook and study guide that best catered for the range of modal preferences. A series of discussions on study skills was presented with a focus on the application of modal preferences in study (and life in general). The remainder of this paper focuses on what was done to achieve the respective modal preferences within the study materials.

For visual students

Visual presentation was achieved by:

- The study book uses schematic summaries (mind maps), icons, bold type and diagrams. Cartoons were to be used, but copyright problems meant it was not feasible to use them.
- The textbook uses schematic summaries, bold type, diagrams and coloured boxes.
- The textbook has a website that is suitable for visual students (but only marginally).
- In lectures, use is made of PowerPoint colour slide presentations, schematic summaries, multiple colours (on the whiteboard) and appropriate web sites, especially the major newspapers.
- In lectures some use is made of videos, eg, in analysis of the recent Federal Budget and in description of the Great Depression.

For aural students

Aural presentation was achieved by:

- Developing a sixty-minute audiotape that introduces the subject matter to distance students.
- Providing tele-conferences two or three times during the semester so that distance students can interact verbally with the lecturer and other students.
- Providing three hours each week on lecture-discussion sessions (supplemented by two-hour tutorials each week) for on-campus students. Aural students are encouraged to 'think aloud'. A 2 ½ day voluntary residential school is provided for distance students.
- Guaranteeing the lecturer's availability for telephone consultation for distance students (Monday evenings from 7:00 until 9:00 is set aside specifically for this purpose).
- In lectures important points are repeated at least three times and some use is made of videos.

For read/write students

Read/Write presentation was achieved by:

- Written text in the textbook.
- Introductory comments, summaries and conclusions for all the 'modules' in the subject are provided in the study book.
- The textbook website is suitable for read/writers.
- There is an Internet-based discussion group that allows lecturers and students using the textbook anywhere in the world to interact efficiently by writing notes.
- Clear directions about what to learn in the study book.
- A class discussion group on the university computer network that any student can access.

For kinaesthetic students

Kinaesthetic presentation was achieved by:

- 'Learning tips' in the Study Guide.
- Numerous practice questions, with answers, in the Study Guide (students are encouraged to 'cheat' by looking up the answers whenever they get stuck).
- Reinforcement exercises in tutorials, with answers supplied at the end of semester before the examination.
- Boxed materials (examples) in the textbook.

- Use of current affairs during lectures in order to reinforce or question theory discussed in class, often accessed via the Internet.
- Use of examples during lecture-discussion sessions.
- Comments in the study book and during lectures that summarise practical applications of theoretical tools.
- Notes on tutorials, and all assessment tasks (including the previous final examination paper) are made available.

The full package of learning resources in the subject comprised:

<i>Resource</i>	<i>External Students</i>	<i>Day Students</i>
Introductory book	Yes	Yes (separate version)
Study book	Yes	Yes (non-mandatory purchase)
Audio tape	Yes	No
PowerPoint slides	Yes	Yes
Lectures (3 hours)	No (Yes for local students)	Yes
Residential school (6 hours)	Yes	Yes (non-mandatory)
Tutorials (2 hours)	No (Yes for local students)	Yes
Tele tutorials	Yes	No
On-line discussion group	Yes	Yes
Textbook	Yes (mandatory)	Yes (mandatory)
Study guide and tutorial (to accompany textbook)	Yes (mandatory)	Yes (mandatory)
Faculty of Business Communications Skills Handbook	Yes (mandatory)	Yes (mandatory)
Notes on tutorials, assignments and tutorial portfolio (hard-copy and on-line)	Yes	Yes
Videos	No	Yes

The final examination

It is very difficult not to make the final examination a read/write examination. However, the design of the examination has been altered substantially to take modal preferences into account. Originally, the examination was strongly read-write oriented with a series of questions requiring long, written answers with a three-hour time limit. The exam is now two hours and comprised of three parts:

- Part A is forty multiple-choice questions that focus on content knowledge.
- Part B is five short answer questions that focus on conceptual understanding.
- Part C is one (out of two) long answer question that focuses on critique and/or application of a body of theoretical knowledge within a specific context. Students are advised in this section to feel free to use visual, read/write or kinaesthetic approaches. For example, mind-maps and executive summaries are equally acceptable; arguments based on theoretical principles and practical examples are equally acceptable.

To help students prepare for the final examination detailed 'suggested answers' to the previous year's examination are provided and one of the assignments is designed to simulate the final examination. Detailed feedback on this assignment is provided to students.

A preliminary assessment of this strategy

Students are provided with copious information about how the subject matter has been designed and is delivered. The most helpful thing provided to students appears to have been the Hints for Study and Examinations. These hints provide students with guidelines that enable them to use their modal preference, regardless of whether or not the lecturer presents material according to their preference. This is possibly the great strength of the approach developed by Fleming (n.d.).

The strategy adopted appears to have been successful. Attendance data for on-campus students indicate that fewer dropped out of Macroeconomics for Business and Government in 1999 than had been the case in previous years. Previously, up to 60 percent of students ceased attending lectures and 80 percent ceased attending tutorials by late in the semester. Around one-quarter of students still enrolled at the end of the semester did not sit the examination. At the mid-way point in the first semester of 1999, attendance at lectures and tutorials was around 90 percent. In the last few weeks of the semester attendance was approximately 75 percent. This was encouraging and indicated that the learning experience may have been more positive than it was previously, although the class of 2000 has not sustained the higher attendance levels.

Assignment marks in 1999 and 2000 were very much higher for both on-campus and distance education students than in previous years (although the assignments arguably were easier than the equivalents in previous years).

Examination results showed vast improvement over previous years, especially in 1999. This is clearly seen in the data on the distribution of final grades set out in table 1 for the period 1997 to 2000. Possibly the most outstanding result was a dramatic decline in the proportion of students who did not complete all assessment by the time examination results were officially released – down from 25.0 percent in 1998 to just 1.7 percent in 1999 and 4.8 percent in 2000. Furthermore, in 1998, of the students who sat deferred examinations 43 percent failed, but in 1999 all three who sat deferred examinations passed. There was also a marked increase in the proportions of students awarded high distinctions, A and B passes in 1999 and, to a lesser extent, in 2000 compared to 1997. The proportion of students who failed fell from 30.4 percent in 1998 to 5.1 percent in 1999 and rebounded to 21.0 percent in 2000. At this point it should be noted, however, that the data for 'fail' are not strictly comparable because the cut-off for a pass was changed from 42 percent in 1997 to 45 percent in 1998 and 1999 and 48 percent in 2000. Had the cut-off been 48 percent in 1997 well over 50 percent of students would have failed.

Table 1: Final Results in Macroeconomics 1997 to 2000

	1997						
	<i>High distinction</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>F</i>	<i>Incomplete</i>	<i>Total</i>
<i>Number</i>	4	10	25	72	78	17	206
<i>% of total</i>	1.9	4.9	12.1	35.0	37.9	8.3	100
	1998						
<i>Number</i>	3	8	22	49	56	46	184
<i>% of total</i>	1.6	4.3	12.0	26.6	30.4	25.0	100
	1999						
<i>Number</i>	14	30	61	58	9	3	175
<i>% of total</i>	8.0	17.1	34.9	33.1	5.1	1.7	100
	2000						
<i>Number</i>	4	18	20	50	26	6	124
<i>% of total</i>	3.2	14.5	16.1	40.3	21.0	4.8	100

In addition to evidence of improved assessment outcomes, there is indirect evidence that students' learning experience improved. This evidence is in the form of student evaluations of teaching (SET). In table 2 these are summarised for the period 1998 to 2000. A check mark indicates a mean score greater than the university average. It is clear that student evaluations improved relative to the university as a whole in 1999 and 2000 compared to 1998. Students were apparently happier about their learning experience in 1999 and 2000.

Table 2: Summary of Teaching Performance, 1998 to 2000

<i>Question</i>	<i>Mean</i>		
	<i>1998</i>	<i>1999</i>	<i>2000</i>
1. Made clear the objectives for each session	✓	✓	✓
2. Was able to explain concepts clearly		✓	✓
3. Seemed well prepared for each session		✓	✓
4. Taught the subject matter in a way which helped me understand		✓	✓
5. Tried to make the unit interesting		✓	
6. Demonstrated the relevance of the unit to the whole course		✓	
7. Made opportunities to ask questions		✓	✓
8. Was available for consultation		✓	✓
9. Structured sessions in a logical way		✓	✓
10. Gave adequate feedback on assignments and other prescribed work		✓	✓
11. Rate the teaching of the lecturer in this unit		✓	✓
12. The unit covered what the unit description said it would			
13. The criteria used to assess student work were clear		✓	✓
14. Assessment tasks allowed me to demonstrate what I had learnt	✓	✓	✓
15. The workload was comparable with other units at this level			✓

Taking assessment outcomes and the results of student evaluations of teaching, it is apparent that there is prima facie evidence that the improvements and changes made to the subject and based on modal preference, have had some impact on student performance and learning experience. However, claims of success must remain tentative and modest until more years of data are gathered, particularly in the light of the more 'normal' failure rate in 2000.

Addressing adult learning needs in distance education study materials

Background

The subject under consideration in this section is 'Human Resource Development', which is a second year specialist human resource management practices subject with a typical enrolment of 160 students, of whom approximately 120 are distance education students. The distance education students are mainly located throughout Australia, with a number from Southeast Asian countries and the Pacific Islands. Virtually all distance education students are mature age students and in the workforce.

Previously the subject had an obscure title - 'Human Resource Development: The Employment Process' - and was presented as a theoretical training and development subject in terms of content. Assessment was by two essay assignments and a final examination comprising three or four essay questions. The distance education study materials were structured around twelve one-week modules that relied on substantial reading. The pedagogical approach was largely teacher-centred and the day students also purchased a complete set of distance learning notes (presumably as a study aid rather than necessity).

Little consideration appeared to have been given to the diversity of learning styles, individual modal preferences and the diversity of the students taking the subject. This background motivated the lecturer to explore the use of pedagogical and androgical principles proposed by Smith (1998) and Tovey (1997) who infers that andragogy has some practical implications and that knowledge of adult learning needs to be used to guide deliberations on how to design, develop, present, assess and evaluate programs. 'Conscious decisions need to be made about the most appropriate techniques to use, given the learner characteristics for a particular course' (Tovey 1997:33).

Differentiating between day students and distance education students

Initial consideration was given to addressing the perceived learning needs, preferences and styles of the two different student groups, that is, day students and distance learning students. For day students, the focus was on encouraging them to attend lectures and tutorial sessions as the primary source of their learning where they were engaged in 'face to face' teaching techniques that broke their dependency on the study materials package and which also presented 'value added' learning. (Availability of the distance studies materials to day students resulted in fluctuating attendance at lectures and tutorial sessions, although a level of independent learning was achieved by using the distance studies materials.) This approach was enhanced by use of a softer version of the modal preference strategies outlined elsewhere in this paper.

For distance learning students, a new set of study materials was developed which addressed the issues Smith (1998:174) says defines distance learning programs, that is:

- separation of teacher and learner;
- use of technical media to unite teacher and learner;
- provision of two-way communication; and

- teaching people as individuals.

The materials also addressed specific adult learning needs, which Tovey (1997:32-3) suggests, are:

- everything should be meaningful to the learners in terms of their needs, not those of the teacher;
- learning must be an active process for the learners;
- teachers should aim to use as many senses as possible at the same time;
- people tend to remember best what they learned first and last; and
- feedback that enables the learner to gauge how they are doing and to assess whether the process is worthwhile to them.

Marrying andragogy to adult learning needs in distance education

The lecturer enrolled as a distance education student in another faculty at the university and assumed the role of a 'normal' distance education student. The choice of distance education was intentional because the lecturer's own modal preference is aural so distance education enabled experience of the structure and presentation of study materials, pedagogical approaches and andragogical principles that were addressed, and to reflect on his own learning needs and preferences as a distance education student. The following summarises the main initiatives and changes that the lecturer then introduced into the human resource development distance education study materials.

Meaningful matter

The diverse range of backgrounds and situations in which the students are involved presented challenges. In particular, these included professional needs; diversity in terms of distance and available resources; social, cultural and political influences in their respective areas and countries; and whether they were in static or dynamic environments.

This resulted in the subject being structured into five discreet modules (of varying length ranging from two weeks to 4 weeks per module). This structure presented the material according to a major topic rather than being structured around weekly chunks and it enabled a stronger flow and reinforcement of the key concepts and theories. These could then be contextualised by the students according to their respective backgrounds and situations.

A further approach that enabled the material to develop in a more meaningful way was to structure the content on three levels. Firstly, how does it relate to the student as an individual (as an employee)? Secondly, how does it relate to them as a supervisor or as a line-manager? Finally, how does it relate to the organisation and especially to the strategic directions that the organisation was pursuing to achieve outcomes through people?

These approaches were underpinned by a strategy for the students to develop individual competence, that is, knowledge, skills and attitudes, in each of the five modules. The content also enabled a subtle consideration of professional ethics and compassionate approaches to human resource development.

Active learning and multiple uses of senses

An unfortunate reality of many distance education materials is a heavy reliance on 'read-write' modal preference. The starting point for addressing a wider use of senses was to consider 'how can I get students to learn this material other than by reading?'

This was primarily addressed by adopting a more personalised and conversational writing style. The materials were written in the pretence that the student was sitting in the writer's office and they were conducting 'Oxford' style tutorials. This presented a perception of activity and interaction to reduce dependency on reading by opening up opportunities to use other senses. For example, by setting activities that encourage students to talk (to other students, work colleagues etc); to reflect on their own experiences and situations; story telling within the study materials; and reducing the number of text chapters and prescribed readings that accompany the study book.

The prescribed text chapters and readings were supplemented with other modal choices such as substantial Internet web-site addresses, electronic discussion groups, e-mail communications with subject matter experts (other than the subject lecturer), telephone access, telephone tutorials, and residential schools. An introductory and subject overview audiocassette was recorded to assist the aural learners who typically do not thoroughly read the written materials.

Primacy and recency

This area of adult learning need was addressed by a writing strategy of conversational introductions and conclusions to each module; breaking the module content into weekly segments; and carefully creating linkages to earlier and future concepts as well as other reference points. The use of language is important, for example, 'you will recall ...', 'if you refer back to ...', 'we will look at ...'

Feedback

Feedback was approached at both formal and informal levels. The underlying challenge was 'how can this relationship be personalised so there are opportunities for communication to take place other than in written assignments and exams?'

On the informal level, extensive use has been encouraged and made of e-mail and electronic discussion groups. This involves promptly responding to student e-mails and participating in the electronic discussions. Direct telephone and mobile telephone numbers have been provided to students to enable contact when the subject leader is both on and away from campus. This has been directed towards reducing the tyranny of distance and perceived isolation that confronts distance education students.

On the formal level, assessments were changed to develop competencies at four levels:

- demonstrated knowledge of the relevant theory and concepts;
- demonstrated ability to apply the relevant theory and concepts;
- development and demonstration of critical reasoning, analysis and independent thinking; and
- demonstrated writing skills.

Although all modules of the subject are assessed by either assignment work or examination, specific information about assessment and marking is provided in the form of detail of marking allocations, detailed marking criteria and assignment feedback, and practice questions that are close to the actual exam questions (to reduce exam anxiety).

At the time of preparing this paper the formal evaluation to ascertain outcomes of the initiatives taken to cater for adult learning needs had not been completed. However, initial

evaluation questions related to modal preferences and the course changes based on adult learning needs were asked of 24 day students. Their responses were:

- 58 % strongly agreed/agreed, 34 % were neutral, and 8 % disagreed the VARK analysis had helped them to improve their learning;
- 96 % strongly agreed/agreed and 4 % disagreed the assessment tasks allowed them to demonstrate what they had learnt;
- 87½ % strongly agreed/agreed, 4 % were neutral and 8½ % disagreed he staff member had their learning as a central interest;
- 78½ % strongly agreed/agreed, 13 % were neutral and 8½ % disagreed the staff member taught the subject matter in a way that helped them to understand it;
- 42 % strongly agreed/ agreed, 29 % were neutral and 29 % disagreed the Study Book was essential to their learning (as a Day student); and
- All things considered, the overall rating of the teaching was 87 % excellent/very good, 4½ % good and 8½ % were satisfactory/not quite satisfactory.

Conclusion

University education has undoubtedly had to rise to the challenge of increased diversity among students in recent years. Many university teachers have always been sensitive to the needs of students, but it is becoming more and more important for us to explicitly recognise diversity of learning needs as we develop teaching materials. Although the lecturers involved in this paper both have a concern for developing approaches that improve student learning experience and assessment outcomes, it is obvious from this paper that, at an operational level, they have developed their teaching materials in ways that reflect different learning paradigms. Just as diversity among student learning needs can be expected, so too can variation among teachers be expected in terms of how they deal with that diversity. University students and teachers alike need to recognise that taking learner diversity seriously does not necessarily mean that any one approach is best. What matters is that everyone understands and respects the diversity and takes it into account both when teaching and learning.

Keywords

Learner diversity, adult learning, andragogy, learning styles, modal preferences.

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