

MEETING THE CHALLENGE OF 'MASSIFICATION': TAKING LEARNER DIVERSITY SERIOUSLY

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INTRODUCTION

Diversity among learners has always been a factor that university teachers should take into account when designing or delivering subject matter. 'Massification' of university education seems to have brought diversity into focus in Australia during the last two decades, perhaps more acutely in the post-Dawkins universities. In this chapter, 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. There is no intention to attempt to prescribe best practice. The authors have not implemented identical strategies in their respective subjects, but they have a common objective: to improve learning and assessment outcomes by recognising the different learning needs of different students.

The genesis of this chapter was in 'chewing the fat' after meetings of the academic Appeals Committee in the Faculty of Business at the University of Southern Queensland. Often, the topic of conversation turned to principles of learning as we sat musing about the number of students who seemed to be totally bewildered by their failure after (apparently) having worked diligently through the semester. It seemed too easy to blame 'massification' of university education and the influx of fee-paying overseas students for high failure rates and the consequent volume of academic appeals. Could learner diversity be the real problem? Could more careful design and delivery of subject matter make a contribution to its resolution?

This chapter focuses upon how two concerned university teachers made a commitment to more action than talk on the matter. The assumption was made that diversity among learners has always been a factor that university teachers should take into account when designing and delivering subject matter, but that the need to do so had become more acute during the last two decades, particularly in the post-Dawkins universities. Specifically, in this chapter, some strategies are outlined and

preliminary comments on their effectiveness are made. The strategies 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 author 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 chapter focuses upon how the authors have set about achieving their common objective to improve the education experience and assessment outcomes of students by recognising the different learning needs of different students.

The chapter is organised into two main sections. Following a brief description of 'massification,' Pedersen outlines and assesses his approach to a human resources management subject while St Hill outlines and assesses his approach to an economics subject. These two sections form the base for the conclusions that are presented.

'MASSIFICATION' IN AUSTRALIAN UNIVERSITY EDUCATION

'Massification' is a word coined by the organisers of the *Teaching and Learning Conference, 1999* in Darwin and refers to the rapid increase in student enrolments in the late 1980s and the 1990s. The increase in numbers has been quite astounding as the data in Table 1 indicate. Between 1985 and 1999 the total number of students enrolled in Australian higher education increased by 85 per cent from 370 000 to nearly 690 000. The proportion of overseas students increased from 4.8 per cent in 1989 to 12.1 per cent in 1999. Between 1950 and 1986 most overseas students were studying in Australia under various government-funded schemes such as the Colombo Plan. In 1980 an Overseas Student Charge was levied and by 1986 universities were free to charge full fees to overseas students. Once freed from the restrictions of government-funded scholarships, the demand for places by overseas students increased rapidly and between 1988 and 1999 enrolments grew by over 71 000. Almost two-thirds of the increase in total student numbers was reflected in an increase in the internal, full-time mode of study, but there was also a sizeable increase in numbers studying in external mode. The percentage of female students exceeded male students for the first time in 1987 and has continued to increase since then. Finally, there has also been an increase of 76 000 in the number of students over 30 years of age, although they have not increased proportionally.

The data in Table 1 indicates that higher education in Australia has absorbed a very large increase in student numbers during the late 1980s

and the 1990s. Although data on diversity of student socio-economic and educational backgrounds are not readily available, the sheer increase in numbers implies a much more diverse student body. The proportions of overseas, full-time internal and female students have increased significantly. Of these increases, the increase in overseas students is possibly the most important in terms of diversity of socio-economic status and educational background. In addition, the increase in overseas student numbers implies greater cultural diversity. Clearly, this presents formidable challenges to university teachers.

Table 1: University enrolments in Australia for selected years, 1985 to 1999

YEAR	Total Number of Students	% Overseas	% Internal, Full-Time	% Internal, Part-Time	% External	% Over 30 years of age	% Female	% Male
1985	370016	2.7 (a)	55.2	32.5	12.3	28.0	47.6	52.4
1990	485066	5.2	61.7	27.4	10.9	25.7	52.3	47.3
1995	604176	7.6	58.8	28.7	12.4	27.8	53.9	46.1
1999	686202	12.1	59.3	27.0	13.7	26.7 (c)	55.0	45.0
Change in numbers, 1985-1999	316186	71607 (b)	202289	65483	48414	76009(d)	201278	114908

Notes: p = preliminary data; (a) = 1988; (b) = 1988 to 1999; (c) = 1998; (d) 1985 to 1998
 Sources: Department of Education Training and Youth Affairs (1999), *Students (Preliminary) 1999*, Canberra, various tables
 Department of Education Training and Youth Affairs (1998), *Selected Higher Education Student Statistics, 1998*, Canberra, various tables.
 Department of Education Training and Youth Affairs (1998), *Higher Education Students Time Series Tables*, Canberra, various tables.

In the following sections some approaches to teaching in the context of student diversity are described. These are based on the experiences of the authors in their classes from two different disciplines: human resource development, and macroeconomics.

HUMAN RESOURCE DEVELOPMENT

Background

The subject is a second year human resource management practices subject with a typical enrolment of 50-80 on-campus students and 120-150 distance education students. The distance education students are

located mainly in the South East Asian countries, the Pacific Islands, and United Arab Emirates. Virtually all the distance education students are mature age students and in the workforce.

Previously the subject had the somewhat obscure title 'Human Resource Development: The Employment Process' and was presented as a traditional and theoretical training and development subject in terms of content. While students appeared to find the course 'interesting', student folklore also indicated that it was quite easy to pass. Assessment followed the familiar pattern of two essay assignments and a final examination comprising three or four essay questions. The content was structured around twelve weekly lectures and tutorials for on-campus students and twelve one-week modules for distance education students with a very heavy reliance upon reading. The pedagogical approach was largely teacher-centred and did not differentiate between day students or distance education students (in either content or assessment). In fact, both day students and distance education students all received the same package of study materials.

Little consideration had been given to the diversity of learning styles, individual learning preferences and the diversity of the students taking the unit. This background motivated Pedersen to explore the use of pedagogical and androgical principles based around Smith (1992) and Tovey (1997).

Differentiating between day students and distance education students

The first consideration was to address the perceived learning needs, styles and preferences of the different student groups, i.e. day students and distance education students. This involved developing the subject so that the day students could be taught using 'face-to-face' teaching techniques which broke the dependency on the study materials package and presented 'value added' learning. (Typically, the external studies packages are also available to day students and many fluctuate between attending some lectures and/or tutorials and independent learning.) It also involved developing a package of materials that not only addressed the issues which Smith (1992, 120) says defines distance learning programs:

- separation of teacher and learner
- use of technical media to unite teacher and learner
- provision of two-way communication, and
- teaching people as individuals,

but that also addressed specific adult learning needs which Tovey (1997, 32-33) 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 first, and possibly radical, approach was for Pedersen to enrol as a distance education student in another faculty at the university and to play the role of a 'normal' distance education student. This enabled him to focus on the structure and presentation of study materials and the pedagogical approaches and andragogical principles that were addressed, and prompted considerable reflection on his learning needs and preferences as a distance education student. The following summarises the main initiatives and changes that Pedersen then introduced to his own course.

Meaningful matter

This was addressed by considering the range of needs that existed in the diverse range of backgrounds and situations that the students presented. These included professional needs; diversity in terms of distance and available resources; social, cultural and political influences in their respective countries; and whether they were in static or dynamic environments. This led to the course being structured into five discrete modules (of varying length): (1) developing a theoretical basis for Human Resource Development; (2) the changing nature of work and careers; (3) theory and practicalities of training; (4) performance management, planning and review; and, finally (5), strategic HRD considerations. The content was intentionally structured to develop individual competence in each of the five modules, i.e. developing knowledge, skills and attitudes. The content also enabled the subtle injection of professional ethics and the development of a compassionate approach to managing themselves, staff for whom they may have supervisory or managerial responsibility, and organisations in which and with which they might be involved.

Active learning and multiple use of senses

These were addressed by intentionally asking 'how can I get students to learn this material other than by reading?'. The first objective was to reduce the tedium and bulk of the Study Book by adopting a more

personalised and conversational writing style. Despite instructional design advice that this was extremely difficult to achieve, the materials were written in the pretence that the student was sitting down in the writer's study and they were conducting an 'Oxbridge' style tutorial. This presents a perception of activity and interaction that breaks the dependency on reading and opens up opportunities for use of other senses. These have been addressed by encouraging 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 selected readings. The latter have been supplemented with substantial Internet web-site addresses, discussion groups, e-mail communications with subject matter experts, telephone access, telephone tutorials, and residential schools. An introductory and course overview audio cassette was recorded to meet the needs of the aural learners who do not thoroughly read the Introductory Book and the Study Guide.

Primacy and recency

This area was addressed by a deliberate writing strategy of having conversational introductions and conclusions to each module; breaking the modules' 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, eg. 'you will recall ...', 'if you refer back to ...', 'we will look at ...'.

Feedback

Feedback was addressed at both formal and informal levels. The intention was 'how can I personalise this relationship' so that 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. This involves being accessible via e-mail and promptly responding to student e-mails. Direct telephone and mobile telephone numbers are provided for contact when on, and away, from campus. On the formal level, assessment has been changed so a range of competencies are developed. This involves four levels—demonstrated knowledge of the relevant theory and concepts; demonstrated ability to apply the relevant theory and concepts; the development and demonstration of critical reasoning, analysis and independent thinking; and demonstrated writing skills. Although the subject is assessed either by 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).

MACROECONOMICS

Background

The subject in question is a second year macroeconomic theory and policy subject with a typical enrolment of 70-100 on-campus students and 150-200 distance education students, with greater numbers in more recent years, with the exception of 1999 when numbers declined. The typical failure rate prior to 1997 was in the 20-25 percent range, but in 1997 the failure rate increased dramatically to over 40 percent. Part of the reason for this was undoubtedly 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 reveals much diversity among the students. As mentioned above, the subject is a second year semester-long subject in macroeconomic theory and policy. Students must pass the prerequisite introductory economics subject before they enrol in it. For students enrolled in majors other than economics, this subject is the second economics subject in their degree (for economics majors it is the third). In 1999 there were 177 students enrolled.

Of the 177 students, 24 percent were day (internal) 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 in 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 per cent of students were in the Commerce degree, with a further 15 per cent in the Business degree. Within their degrees, students must choose at least one major, a major being defined as (at least) eight credit points of prescribed coursework. The following majors are eight points from a course total of twenty-four credit points: accounting, economics, finance, government (no longer offered), information technology and marketing. The following majors are 12 points: accounting/finance, banking/finance and computer software development. It is possible for students to enrol in double majors, but the student database cannot identify these students, except

those enrolled in a banking and finance double major which is 16 credit points in length. The most common majors among students were accounting/finance (44 per cent of students enrolled), finance (17 per cent), banking/finance (15 per cent) and economics (11 per cent). All the other majors attracted fewer than five students each, except accounting, which attracted seven students. For the overwhelming majority of students (94 per cent), the subject was compulsory unit.

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 unit and have 12 credit points yet to complete. In fact, only 7 per cent of students were in this position - 27 per cent had more than 12 credit points to complete (often because they had failed one or more units during that, or previous, semesters) and 59 per cent 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 units.

This background motivated St Hill to explore the possibility of using the literature on learning styles as a basis for design and delivery of the unit in such a way that it would cater for the diversity among students. Implicit in this was the hypothesis that diversity as described above was associated, at least loosely, with diversity of learning styles.

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 extroverts/introverts, sensors/intuitors, thinkers/feelers and judgers/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. The 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
- Kinaesthetic: preference for information in the form of experience and practice (real or simulated).

Over a period of some 15 years Neil Fleming (together with Charles Bonwell more recently) has developed a training 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 considerable diversity of modal preference among students. For 40 per cent of respondents there was clear dominance of one mode over the others, with the other 60 per cent of students being bi-modal or multi-modal. Furthermore, in statistical analysis of the final examination it appeared that 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

The principles underlying re-design of macroeconomics were simple: clarity, consistency, and recognition of modal preferences. Clarity was achieved by writing a detailed study book using simple, conversational language (at least for an economist!) and sticking as much as possible to the following golden rules: short sentences; one idea in each sentence; 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 catered, at least to some extent, for all modal preferences. Also, 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 section focuses upon modal preferences.

For visual students

Briefly, the following aspects reflect visual presentation of the subject matter:

- The study book uses schematic summaries (mind maps), icons, bold type and diagrams. Cartoons were also to be used, but copyright problems meant that it was infeasible 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 schematic summaries, multiple colours (on the whiteboard) and appropriate web-sites, especially the major newspapers.
- In lectures, some use is made of videos: for example in analysis of the recent Federal Budget.

For aural students

Aural presentation has been achieved by:

- Developing a thirty-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 for on-campus students. Aural students are encouraged to 'think aloud'. A two half-day, voluntary residential school is provided for distance students.
- Guaranteeing St Hill's availability for telephone consultation for distance students (Monday evenings from 6:30 until 8:30 is set aside specifically for this purpose).
- In lectures, some use is made of videos.

For read/write students

Read/Write presentation has been achieved by:

- The usual written text in the textbook.
- Introductory comments, summaries and conclusions for all the subject matter are provided in the study book.
- The textbook website is suitable for read/writers.
- There is an Internet-based discussion group that allows the lecturer and students to interact efficiently by writing notes.
- Clear directions are given 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 has been 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.

At the moment the subject is planned for Internet delivery in 2000. Internet delivery offers very exciting potential for development of materials that cater for the diversity of student learning needs, from colourful pages to streamed video and audio, to simulations and interactive reinforcement exercises.

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 in the last two years in order to take modal preferences into account as much as possible. 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 comprises forty multiple-choice questions that focus on content knowledge.
- Part B comprises 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 last year's examination were provided and one of the assignments was designed to simulate the final examination. Detailed feedback on this assignment was provided to students.

The students' responsibilities

It is not possible for a university teacher to be all things to all students all of the time. Therefore, students are provided with copious information about how the subject matter has been designed and is delivered. The most helpful thing provided to students is undoubtedly 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 greatest strength of the approach developed by Fleming (n.d.).

An assessment of this strategy

The strategy adopted appears to have been very successful. It was very clear from attendance data that far fewer on-campus students dropped out of macroeconomics than was the case in previous years. In the past, up to 60 per cent of students ceased attending lectures and 80 per cent 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 semester, attendance at lectures and tutorials was around 90 per cent. In the last few weeks of the semester there was approximately 75 per cent attendance at lectures and tutorials. This is hugely encouraging and indicates that the learning experience was more positive than it was previously. Anecdotal evidence suggests that attendance levels in the Macroeconomics subject are now among the highest in the Department or Economics and Resources Management. Marks in the assignments 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).

Table 2: Final Results in Macroeconomics, 1998 and 1999

	High Distinction	A	B	C	F	Incomplete	Total
1998							
Number	3	8	22	49	56	46	184
% of total	1.6	4.3	12.0	26.6	30.4	25.0	100
1999							
Number	14	30	61	58	9	3	175
% of total	8.0	17.1	34.9	33.1	5.1	1.7	100

Examination results showed vast improvement over previous years. This is clearly seen in the data on the distribution of final grades set out in Table 2 for 1998 and 1999. Possibly the most outstanding result was the dramatic decline in the proportion of students who did not complete all assessment by the time examination results were officially released, from 25.0 per cent to just 1.7 per cent. Furthermore, in 1998, of the students who sat deferred examinations 43 per cent 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. The proportion of students failing fell from 30.4 per cent to 5.1 per cent.

With improvements such as these it is hard to believe that the changes made to the subject had no impact on student performance. However, claims of success must remain tentative and modest until a few more years of data are gathered.

CONCLUSION

Massification of university education has undoubtedly increased diversity among students. 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 Pedersen and St Hill both have a concern for developing approaches that improve student learning experience and assessment outcomes, it is obvious from this chapter that, at an operational level, we have developed our teaching materials in ways that reflect different learning paradigms. Just as we can expect diversity among student learning needs, we can expect diversity among teachers 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 that diversity and takes it into account both when teaching and learning.

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