



# KIFT ALTC SENIOR FELLOWSHIP: ARTICULATING A TRANSITION PEDAGOGY

SCIENCE (BIOLOGY)  
CASE STUDY

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Director of First Year Studies in Biology, Dawn Gleeson: The curriculum in Biology is developed by collaboration between the academic staff of the three departments. A number of reviews of the curriculum have been undertaken so that what is taught at first year underpins second year studies. Staff teaching in second year are often involved in first year teaching so there is a vertical integration of lecture topics and laboratory skills.



# 1. CONTEXT

## THE UNIVERSITY OF MELBOURNE

01. Established in 1853, the University of Melbourne is a member of the G08 group and a member of Universitas 21. The full time student enrolment in 2006 was 33 934, of which 25 255 were undergraduate. Twenty six percent of all students (10 461 in 2006) were international students, of which 82 per cent were from Asian countries.

02. The most significant change impinging on any discussion of the university's programs was the introduction of the *Melbourne Model* in 2008, which has meant a complete restructuring of the institution.

03. These programs were described as landmark educational reforms 'designed to create an outstanding and distinctive Melbourne Experience for all students'.

## SIX NEW GENERATION UNDERGRADUATE DEGREES

04. The *Melbourne Model* is based on six broad undergraduate programs, followed by a professional graduate degree, research higher degree or entry directly into employment. The emphasis on academic breadth, as well as disciplinary depth, in the new degrees ensures that a graduate will have the capacity to negotiate their way successfully in a world where knowledge boundaries are shifting and reforming to create new frontiers and challenges almost daily.

05. The university has introduced the *Melbourne Model* to provide students with the best possible preparation for the future global environment and its challenges. By introducing undergraduate degrees featuring both academic breadth and disciplinary depth, the *Melbourne Model* offers students maximum flexibility in choosing their path either directly to employment or via graduate study and research.

06. The six 'new generation degrees' are:

- Bachelor of Arts
- Bachelor of Biomedicine
- Bachelor of Commerce
- Bachelor of Environments
- Bachelor of Music
- Bachelor of Science.

07. In the transition stage several 'old degrees' are still being offered for a finite period of time.

## GRADUATE PROGRAMS

08. To complement the undergraduate offerings, the university has also introduced new graduate programs that will expand on the existing suite of graduate programs. The graduate professional degree programs and new graduate schools will provide more intensive and better supported professional and research training.

09. In some instances, professional accreditation will require a sequence of undergraduate and postgraduate study, an approach strongly supported by industry, and offering graduates enhanced employment prospects and higher remuneration once qualified.

10. The Biology program sits within the 'new generation' *Bachelor of Science (BSc)*. There is also a second stream of Biology which sits within the 'new generation' *Bachelor of Biomedicine*. The discussion in the case study will be mainly about the 'main stream' Biology within the *Bachelor of Science* although there are overlapping ideas between the two.

11. The two Biology subjects within the *BSc (Biology of Cells and Organisms and Genetics and the Evolution of Life)* cater for students who want to:

- major in any of the Life Sciences (Anatomy and Cell Biology, Botany, Genetics, Physiology, Pharmacology, Pathology, Microbiology and Immunology, Zoology etc.)
- be eligible for selection into Optometry
- be eligible for selection into Veterinary Science.

12. However, in 2008 there is a new cohort of students who can complete Biology as 'breadth'.

## WHAT IS BREADTH?

13. Every student enrolled from 2008 will complete 75 points of the 300 points required to graduate as 'breadth'.

14. There are several types of breadth subjects available:

- subjects taken from other New Generation degrees in disciplines different to a student's major area of focus
- specially designed university breadth subjects which explore broad topics (such as climate change) by drawing together the expertise of many different disciplines
- select subjects offered by other faculties (including Arts, Education, Law, Land and Food Resources and Music) can also be taken as breadth, provided they are outside a student's main area of study.

15. Biology for any student apart from *BSc* and *BBiomed* can be studied as breadth.

## LEARNING AND TEACHING GUIDING PRINCIPLES

16. With respect to learning and teaching the University of Melbourne is guided by nine principles.<sup>1</sup> A member of staff who is applying for a teaching award, promotion, or confirmation of an appointment is required to address these principles. Funding for curriculum development is also dependent on linking the innovation to these principles. Program design and teaching should also incorporate the principles.

17. The broad objectives of the 'Melbourne Experience' are that graduates of the university should be enabled to become:

18. **Academically excellent:**

- have a strong sense of intellectual integrity and the ethics of scholarship

- have in-depth knowledge of their specialist discipline(s)
- reach a high level of achievement in writing, generic research activities, problem solving and communication
- be critical and creative thinkers, with an aptitude for continued self-directed learning
- be adept at learning in a range of ways, including through information and communication technologies.

19. **Knowledgeable across disciplines:**

- examine critically, synthesise and evaluate knowledge across a broad range of disciplines
- expand their analytical and cognitive skills through learning experiences in diverse subjects
- have the capacity to participate fully in collaborative learning and to confront unfamiliar problems
- have a set of flexible and transferable skills for different types of employment.

20. **Leaders in communities:**

- initiate and implement constructive change in their communities, including professions and workplaces
- have excellent interpersonal and decision-making skills, including an awareness of personal strengths and limitations
- mentor future generations of learners
- engage in meaningful public discourse, with a profound awareness of community needs.

21. **Attuned to cultural diversity:**

- value different cultures
- be well-informed citizens able to contribute to their communities wherever they choose to live and work
- have an understanding of the social and cultural diversity in our community
- respect Indigenous knowledge, cultures and values.

<sup>1</sup> See Appendix I and <http://www.cshe.unimelb.edu.au/pdfs/9principles.pdf>.

22. **Active global citizens:**

- accept social and civic responsibilities
- be advocates for improving the sustainability of the environment
- have a broad global understanding, with a high regard for human rights, equity and ethics.

23. Learning and teaching in Biology take into account the nine principles and also the graduate attributes of the university.

## BIOLOGY OBJECTIVES

24. The two Biology subjects have defined objectives. The first semester subject, *The Biology of Cells and Organisms*, expects that students will:

- have a knowledge of the basic processes of life
- be familiar with the structure and function of both prokaryotic and eukaryotic cells
- understand the structure and function of organisms, and how these features contribute to the overall functioning of organisms
- understand the mechanisms of plant and animal reproduction and development
- be able to complete basic manipulations with laboratory equipment, in particular the use of microscopes
- develop skills in recording observations, analysis and interpretation of data, and dissection techniques.

25. In terms of generic skills the expectation is that students should be able to:

- plan effective work schedules to be prepared for tutorials, practical classes and examinations
- be familiar with electronic forms of communication and be discerning in the use of the web for seeking information
- integrate the computer software packages into the program to assist learning

- be able to complete basic manipulations with laboratory equipment, in particular use of microscopes
- develop skills in recording observations, analysis and interpretation of data
- develop skills in dissection techniques
- develop skills in preparing slides of fresh material
- develop skills in completing biological drawings
- access basic information from the library both electronically and in a traditional way
- begin to develop skills in working collaboratively with other students in a practical class.

26. The objectives of the second semester subject, *Genetics and the Evolution of Life*, state that, on completion of the subject, students should be able to:

- describe the basic mechanisms of inheritance, including the relationship between phenotype and genotype, transmission genetics, recombination and mutation
- explain the structure of DNA, its replication and the molecular basis of gene action
- describe the nature of genetic variation in populations, natural selection, microevolution, reproductive isolation and speciation
- explain the evidence for the evolution of life including molecular, fossil and phylogenetic data
- recognise and apply the principles of classification; be aware of the diversity of organisms and their relationship to each other and the environment
- be aware of the concepts of population ecology, community structure and ecosystem.

27. In terms of generic skills, the expectation is that students should be able to:

- plan effective work schedules to be prepared for tutorials, practical classes and examinations

- be familiar with electronic forms of communication and be discerning in the use of the web for seeking information
- be able to complete basic manipulations with laboratory equipment, for example, the microscope and gel electrophoresis
- develop skills in recording observations, analysis and interpretation of data
- develop basic skills in statistical analysis of genetic data
- access basic information from the library both electronically and in a traditional way
- begin to develop skills in working collaboratively with other students in a practical class.

## ENTRY REQUIREMENTS

28. Students completing Biology are mainly from the *Bachelor of Science*. This means they have met the prerequisites for Science (shown below). It is worth noting that entry requirements for English will change in 2009 and that, between 2007 and 2008, there has been a reduction in requirements in that only *one* of Biology, Chemistry, and Physics is necessary and the inclusion of the second Mathematics has also gone. This is mentioned because it has relevance to the teaching of Biology. The entry requirements are therefore as follows:

### 2008

29. Secondary school (Victorian Certificate of Education (VCE)) units 3 and 4 — a study score of at least 25 in each of English (any), Mathematical Methods (either), and in one of Biology, Chemistry or Physics.

### 2009

30. Secondary school (Victorian Certificate of Education (VCE)) units 3 and 4 Units 3 and 4 — a study score of at least 25 in English/English Language/Literature or at least 30 in ESL, and a study score of at least 25 in Mathematical Methods (either), and in one of Biology, Chemistry or Physics.

31. The guaranteed tertiary entrance score (ENTER) for Science in 2008 was 85.

32. A student studying Biology at first year does not have to have completed any studies in Biology at secondary school. In fact, students completing Biology as breadth may not have studied any Science since Year 10. This will be mentioned later when the diversity of the cohort is discussed.

## THE STUDENT COHORT

N = 936

Category	Percentage
Male	47
Female	53
Commonwealth Funded Places	78
Australian Full Fee	3
Overseas Full Fee	19
Biology at Year 12	64
No Biology at Year 12	36
ENTER >90	44
Aboriginal/Torres Strait Islander	0.3

## ROLE OF THE DIRECTOR IN THE PROGRAM

33. There is a Director of First Year Studies in Biology. There are four other Directors in first year Science, viz Chemistry, Physics, Maths & Stats, and Earth Sciences.

34. The role is to coordinate the five Biology subjects at first year (approximately 1500 students per semester). There is no Biology Department. Biology is funded by three departments within Science: Botany, Genetics, and Zoology. The lecturing staff come from these departments. The Director liaises with the three departmental Heads and keeps them informed. The Biology Unit operates like a small department, with its own academic staff, administrative staff, a Laboratory Manager and technical staff.<sup>2</sup>

35. The Director's role is to supervise these staff and ensure the delivery of the program. The current Director also gives 37 of the 42 lectures in Genetics to the students.

<sup>2</sup> See Appendix II

## 2. TRANSITION

36. In 1999, the Vice-Chancellor appointed a Transition Manager at the University of Melbourne. Since that time the position has expanded into the Transition and Orientation Program.<sup>3</sup>

37. Transition and Orientation Programs were developed to assist first year students to adjust to life at university. The aim is to contribute to the enhancement of students' academic and life skills development, through targeted programs in association with faculties and service subjects.

38. Other aims of the centralised program are to:

- increase students' satisfaction with the first-year experience of their program and of the University of Melbourne
- increase the awareness and understanding of transition issues in the university community, as well as the larger Australian and international contexts
- maintain and enhance relationships with the school sector to facilitate a more effective transition to university.

39. The Transition and Orientation Program supports staff at the University of Melbourne by:

- providing advice and consultation on faculty, departmental and graduate school transition and orientation initiatives
- liaising between faculties, graduate schools and student services
- coordinating the central orientation program in the first and second semesters
- training student mentors, orientation Hosts and study group facilitators
- hosting the staff Transition Forum
- providing transition publications and other resources for teachers of first year students and for distribution to students

- reporting to the university on transition and orientation implementation and issues
- providing reports from student feedback events and orientation evaluation.

40. Consequently, there is a strong emphasis centrally on transition throughout the university.

41. The philosophy behind the transition events is to facilitate students meeting other students and forming study groups and or a social network. The literature indicates that connecting with other students and having peer support increases the likelihood of academic success.

### PROGRAMS AND EVENTS

42. The sequence of events for students studying Biology that facilitates their transition includes:

- Academic Orientation, where the Director speaks during orientation week to Biology students about *How to get started*. There is also orientation for mid-year intake.
- The *Meet and Greet* tutorial. This was designed to facilitate transition. Previously a tutorial had not been held in week 1 because it was thought a week of lectures was required to cover enough material for a tutorial. The *Meet and Greet* tutorial is not based on Biology content. It is primarily focusing on students meeting their tutor and the other students in their tutorial group. The students wear nametags and meet fellow students via an icebreaking activity. This is followed by a tour of the facilities showing students where their practicals, tutorials, Biology office, and computer facilities are, ending up in the Biology Learning Centre with tea/coffee and biscuits.
- In weeks 2 and 3, all Biology students are scheduled to attend *Science 101*. This is a faculty program consisting of two workshops followed by study groups. This program is a collaborative venture between the Directors of

<sup>3</sup> <http://www.services.unimelb.edu.au/transition/>

the first year subjects, Transition and Orientation Program staff, and administrative staff of the Science Faculty. The program allows plenty of time for students to chat with each other. The icebreaking activity is 'Describe something that is different between this year and last year'. When agreement is reached on a difference the group is asked to illustrate the difference on an overhead which is presented to the group.

43. During the first workshop, a student-staff panel is present and the groups are asked to write down two questions about any aspect of uni life they would like answered by the panel. This provides a forum in which to highlight differences between school and university. The emphasis in *Science 101*, and throughout Biology lectures, tutorials and practicals, is that there is just as much support for the study of Biology at university as a school-based subject. The difference is that a university student has to take responsibility for seeking the support.

44. In the second workshop of *Science 101*, students form into study groups based on a subject which they select, and are assigned a study group facilitator who is a postgraduate student. They discuss how a study group operates and plan what they will do in their first meeting. The faculty books rooms for each group. The facilitator attends each study group and delivers appropriate and timely information about enrolment deadlines, withdrawal dates without HECS debt, examination timetable release, how to apply for special consideration, Language and Learning Skills Unit support and sessions, etc.

- The tutorial program in Biology facilitates student transition. Throughout the semester the tutor also delivers timely information about administrative matters along with information about revision sessions, additional tutorials and other support for students. Biology tutors are continuing members of staff and have a broad knowledge

of university requirements and support for students. Tutorials are not compulsory in Biology so not all students receive this information.

- To facilitate a clear and consistent message from the tutors, a weekly meeting with the Director is held to discuss the following week. In addition, when a new lecturer is introduced to the team, a meeting is organised with the lecturer and tutors to ensure a consistency between the message from the lecturer and the tutor.
- The university wide LMS (Learning Management System) based on Blackboard is used to issue notices, which are also sent via email, and to provide chat rooms at the tutorial level.

## CURRICULUM

45. The curriculum in Biology is developed by collaboration between the academic staff of the three departments.

46. A number of reviews of the curriculum have been undertaken so that what is taught at first year underpins second year studies. Staff teaching in second year in these departments are often involved in first year teaching so there is a vertical integration of lecture topics and laboratory skills.

47. To provide a student with a feeling of horizontal integration between the disciplines at first year, the Directors meet on a regular basis. At these meetings, for example, we agreed to develop Learning Centres in each department (and used a consistent name), mid semester tests are coordinated to ensure they are spread across more than one week, exam revision sessions are scheduled so that a student can attend all of them should they wish, and similar names are used for activities (for example, 'Independent Learning Tasks' in Biology and Chemistry).

## 3. DIVERSITY

### BACKGROUND IN BIOLOGY

48. In the Biology cohort of students, the greatest diversity is with respect to previous knowledge of Biology. Over the past 4 years, 50 per cent of the cohort have not completed a year 12 Biology program (VCE or International Baccalaureate (IB)). In 2008, however, we now have a cohort of students completing Biology as breadth without a Science background. (The BSc students have a Science background as a consequence of entry requirements: see above, under 'Entry Requirements'.)

49. The curriculum design deals with this diversity in the following ways:

- The curriculum includes support for students without a Biology background and, more recently, without a Science background.
- In Biology, additional optional tutorials are available throughout the semester which a student can attend regularly or sporadically depending on need. There is no compulsion and it is left to the students to decide whether to attend or not.
- There is also a 'tutor on duty' in the Biology Learning Centre where a student can seek help individually or in small groups without an appointment.
- There are several Independent Learning Tasks (ILTS) online, which all students complete at their own pace. These mirror the information in lectures and have quizzes to test understanding embedded within them. They provide remediation and extension.
- There are also pre-labs on Compound Microscope Training, Biological Drawing, Biological Terminology, and Pipetting. The Biological Terminology, which is also on the AirPort site mentioned below (next), is useful

In the Biology cohort of students, the greatest diversity is with respect to previous knowledge of Biology.

for English as a second language (ESL) students in that it shows how biological terms can be broken into smaller components and the meaning extrapolated by putting together the pieces.

- Another online support program is Academic interactive Portal (AirPort). This has been developed together with staff from the Learning and Language Skills Unit. It has input from several faculties but the Biology component has a section on essay writing in Biology (for example: how to 'pull apart the question', a section where students are provided with a marking scheme and have to mark three student essays). The final section is the opportunity to submit an essay and this is marked by a tutor.

### BACKGROUND IN SCIENCE

50. For students without a Science background we have some specific online modules, for example, *Catch up Chemistry* and *Catch up Maths*.

### COUNTRY OF ORIGIN

51. Strategies have been implemented to mediate for diversity by virtue of country of origin:

- Students for whom English is a second language also provide diversity within the group. An interesting new development at Melbourne is that, from 2009, any student with an English language subject score of 25–29 (max is 50) or an ESL English score between 30–34 or an International English Language Testing System (IELTS) less than 7 will be given a Diagnostic English Language Assessment (DELA) test on entry and will meet with a program advisor and be provided with support according to need. This may involve an English language subject for credit, which will be included in the breadth component of the degree.

- To integrate overseas, local, regional, and mature age students, the practical class seating and allocation to tutorials is random. A strategy used in tutorials is to divide the group into smaller groups to discuss a question. This assists overseas students who may be reticent about speaking in front of the whole group.
- The diversity of overseas students also means that we recognise religious festivals from many countries when dealing with practical class and tutorial class changes. The university publishes an Interfaith Calendar. We also take different attitudes into account when we have dissection in practical classes. An alternative is offered if there is a conscientious objection to dissecting animals.

## STUDENTS AT-RISK

52. The Faculty of Science requests feedback from Directors after the mid-semester test period to identify from the tests which students are at-risk. These students are contacted individually and information about appropriate support is given. At the end of semester 1, any student who fails two out of four subjects is considered a *Student at-Risk* and is offered an interview with a program advisor and information about support that is available.

## 4. DESIGN

53. Biology at first year is content rich, although there has been a gradual move away from content to, as one lecturer puts it, ‘emphasis on understanding of ideas, concepts and patterns (not mountains of facts)’. The program is designed to integrate the four components so that each presents a topic from a different perspective. The tutorials reinforce the material in the lecture and the practicals are hands-on experience of the lecture material. The independent learning tasks are reinforcement of lectures but some have remedial activities and others enhancement (extension) activities. It is hoped with the different ways of presenting the material that students will find one method that suits them.

54. The lecturing staff in first year Biology are selected from some of the key researchers in each of the departments. The group now includes staff who are excellent teachers. The reason for including high profile staff is to provide a rich first year experience and to encourage students to continue in the discipline.

55. One of the key messages to students throughout semester 1 of first year from the Transition Program, Learning and Language Skills Unit, and lecturing and tutoring staff is that we want to encourage students to become ‘independent learners’ and to prepare them for ‘lifelong learning’. There is certainly some un-teaching of strategies for learning carried over from school. The emphasis on the examination and Tertiary Entrance Score (TER) score is difficult to un-teach.

## 5. ENGAGEMENT

56. Factors that can make it difficult to engage students in the current university climate are: the necessity for part-time work, feeling isolated because of ethnic background or under-represented school, no friends, not seeing the relevance of a subject, enrolling in the wrong program, or academic difficulty with the subject.

57. Tinto,<sup>4</sup> when addressing the question ‘what conditions promote student learning?’, suggests four factors:

- *First, high expectations are a condition for student learning. Students learn best in settings that hold high expectations for their learning, provide clear and consistent standards for their learning, and do so in ways that apply to all students, not just some.*
- *Second, support is a condition for student learning. Settings that provide academic and social support that is accessible to students are settings in which students are more likely to become successful learners. Here the operative word is become. Least we forget the first year is a period of becoming, a period of transition that*

<sup>4</sup> Vincent Tinto, Syracuse University, Keynote address presented at the Southwest Regional Learning Communities Conference, 28 February to 1 March 2002, Tempe, Arizona.

requires students make a series of academic and social adjustments to college. Without academic and social support some students are unable to make that transition.

- Third, feedback is a condition for student learning. Learning best occurs in settings that provide learners frequent feedback about their learning as they are trying to learn.
- Fourth, involvement is a condition for student learning. Settings that actively involve students in learning, especially with others, are settings that yield increased time on task and in turn greater learning.

58. In the Biology program there are strategies in place to improve these four conditions.

Facilitation of student engagement in Biology	• the <i>Meet and Greet</i> tutorial in week 1
	• Biology Learning Centre — a physical space with tutor assistance
	• tutorials each week where students break into smaller groups for activities
	• working with a partner or a small group in practicals
	• study groups coming out of the Transition program <i>Science 101</i> , which is subject-based so that Biology students meet together.

59. One floor of the building is devoted to a Biology Learning Centre. In this space are the tutor offices with a 'Tutor on Duty' available for consultation. There are smaller rooms that students use to meet, eat lunch or just chat, and one room has a hot water source. There are soft furnishings, noticeboards, computers and reference material in this space.

60. There is no mentor program in place in Biology, but half the demonstrators in any practical class are either Honours students or Postgraduate students from the department responsible for the practical. In appointing demonstrators there is always

preference given to these students because it is thought they can communicate with the Biology students and talk about their studies beyond first year and show the relevance of the current study.

61. In the new *Melbourne Model* there is a Science Student Centre where students can go for personalised advice about their program. The idea of the student centres is to have a 'one stop shop' for students within that program. This advice can include referral to support such as language and learning skills, counselling, financial aid, housing, disability liaison unit, depending on the issue that may be raised.

62. Genetics also runs 'Careers Nights' once a semester where two speakers who have majored in Genetics talk about their career path. One usually has a PhD and the other a different career path. After the talks drinks and food are offered and the speakers, academic staff, postgraduates and honours students from Genetics are in attendance to speak to students. The most recent event attracted over 200 students.

63. One of the challenges in Biology within the new model is to cater for students completing Biology as breadth. No longer do we have combined degrees but students from any other degree apart from Science or Biomedicine can study Biology. We hope (but have no feedback yet) that the support already in place is catering for these students.

## 6. ASSESSMENT

64. The assessment of Biology has changed each year for a number of years with the purpose of catering for diversity within the student group and to encourage independence in learning.

65. The assessment is continuous and both summative and formative. The assessment is divided into four components:

1. Practical work 25% — this has to be passed to pass the subject. The assessment in practical classes is very varied:
  - It may be testing a competency — examples are, focusing a microscope, preparing a slide, a

biological drawing, dissection skill, getting a yield of DNA.

- In some cases there is a short open book (lab manual) multiple-choice test at the end of the prac.
- In some cases the prac is handed in for marking.

Each practical activity has clear aims and objectives. The assessment is continuous. The feedback on work handed in includes written comments and answers with a marking scheme. Answers are provided to test items. Immediate feedback in the practical class is provided on a competency.

#### 2. Mid-semester test 10%:

- Online 25 multiple choice questions with instant feedback once the answers are submitted.

The online multiple choice test provides immediate feedback to a student at the completion of the test. Results of students scoring 45% or less are sent to the student centre and they are contacted with information on support available.

#### 3. Independent learning tasks 5%:

- These are online activities mentioned previously; assessment is 'completion' or 'non-completion'.

This is principally formative assessment because the credit is for completion not the test mark. It provides a student with continuous feedback on their progress with 'low stakes'.

#### 4. Final 3-hour examination 60%:

- The paper consists of three types of questions: multiple choice, short response with a menu of options, and essays.

## 7. EVALUATION AND MONITORING

### MONITORING

66. The method of monitoring students and identifying students at-risk has been mentioned mentioned earlier under the heading 'Diversity'.

67. Recognising very talented students is achieved with a Biology prize for each subject and Dean's awards.

68. There is heavy reliance on tutors to monitor student progress. The tutors in Biology are Tutor A level but on continuing part-time appointments. The eight tutors form a very stable core of experienced staff with immediate contact weekly with the students.

### EVALUATING

69. University of Melbourne has a centralised 'Quality of Teaching' questionnaire that has to be completed by the students in every subject every semester.<sup>5</sup>

70. The questions are:

1. I had a clear idea of what was expected of me in this subject.
2. This subject was well taught.
3. This subject was intellectually stimulating.
4. I received helpful feedback on how I was going in this subject.
5. In this subject, teaching staff showed an interest in the academic needs of the students.
6. I felt part of a group of students and staff committed to learning in this subject.
7. There was effective use of computer-based teaching materials in this subject.
8. Web-based materials for this subject were helpful.
9. Overall, I was satisfied with the quality of the learning experience in this subject.

<sup>5</sup> [http://www.upo.unimelb.edu.au/Public/Qual\\_Eval/EC\\_QoT.html](http://www.upo.unimelb.edu.au/Public/Qual_Eval/EC_QoT.html)

71. The data from these questionnaires are published for each subject. Associate Deans in each faculty contact coordinators about low scoring subjects.

72. Since a team teaches Biology and there is a lot more feedback that is useful to us, a Biology specific questionnaire is administered (see Appendix III). The written comments on the back of the questionnaire are very useful and are reviewed by all staff teaching in the subject. Changes have been made on the basis of the student feedback in the questionnaire, including lecturing staff changes, tutors, changes in the way feedback is given, and changes to assessment.

73. In addition to the questionnaire, feedback is obtained via a Staff Student Liaison Committee for each subject. A meeting of student representatives and academic staff is held each semester. Students from each practical class volunteer to be student representatives. They are provided with guidelines on how to obtain feedback from a class and how to report to a meeting (see Appendix IV). Minutes are recorded and distributed to the representatives and placed on the Learning Management System (Blackboard).

## 8. IMPLICATIONS FOR IMPLEMENTATION

### SPACE

74. Biology has its own space dedicated to teaching first year students. It consists of:

- Two laboratories that hold 110 students, one of which was refurbished in 2007–2008 and includes a multimedia set-up for a touch panel to transmit from an overhead camera, cameras attached to microscopes, video, and data projection. Each student has their own dissecting and compound microscope.
- Three tutorial rooms with moveable furniture.

- Two computer labs each with 30 Macs.
- The Learning Centre (mentioned earlier) with tutor offices and small rooms for collaborative learning.

75. The technical preparation for Biology is handled by the Laboratory Manager and three other full-time staff who are located in the building where Biology is taught. This building is separate from the three Departments of Botany, Genetics and Zoology. The Biology group liaise with the three departments in the preparation of the practicals where necessary.

76. The administration of Biology is carried out from an office in the same building as the teaching. There is an enquiries window where practical class changes, special consideration, sale of manuals etc. are carried out. There is a move, as a result of the *Melbourne Model*, to handle some of these tasks centrally within the Science Centre.

77. At the Science Centre a student can seek program advice at any time (as referred to earlier under the heading 'Engagement').

### TIMETABLING

78. Timetabling of Biology is done centrally but with input from the Biology staff. The rooms mentioned above are 'Biology designated' and Biology has first preference. There is a program that produces a timetable for a student. This can be modified online by the student or with assistance, currently from the Biology office, but will soon be facilitated via the Science Centre. A new timetabling system will be introduced in 2009. Timetables will be released in November of the previous year for enrolled students.

### QUALITY OF STAFF AND REWARDS FOR TEACHING

79. In 2002, the university introduced university-wide teaching awards. Previously the Faculty of Science had its own teaching awards. The categories for the faculty awards now include an award for tutors as well as teachers of large and small classes.

80. A recipient of a university teaching award is expected to apply for an Australian Learning and Teaching Council (ALTC) award and is given support from the Centre for the Study of Higher Education (CSHE) in preparing the application. There has been a shift in the emphasis on the criteria for promotion such that 'Outstanding Teaching' can now be the basis for promotion from Level C to D if the thresholds for the other criteria are met.

81. The Vice-Chancellor sponsors an annual colloquium which features the winners of the university teaching awards and those receiving ALTC awards and citations. Over 400 staff attend these colloquia each year.

82. CSHE, mentioned above, provides support and advice for staff by running sessions on good teaching. Lunchtime seminars, which are very well attended, have been organised on such topics as teaching large classes and assessment and mentoring, to raise the profile of good teaching. CSHE also coordinates a *Graduate Diploma of Tertiary Teaching*. The publication of the 9 Principles guiding learning and teaching emphasises the fact that good teaching is important at the university.

83. As mentioned earlier (under the heading 'Design'), over a period of time the staff lecturing in the first year program now include some of the best teachers. Many have won faculty or university teaching

awards, (previously) Australian University Teaching Committee (AUTC) and (now) ALTC awards. The value of good teaching at first year is well recognised as a means of ensuring students remain at university and continue in the discipline.

84. Lecturing at first year is onerous because each lecture is repeated three times. Each department has its own method of allocating teaching loads but it is well recognised that teaching at first year requires special talents and so staff do not see it as drawing the 'short straw' but a real chance to excite and engage the students.

85. The core of tutors who are part-time and continuing are appointed specifically for teaching in Biology. They take all of the tutorials and act as supervising demonstrators in practical classes. The casual staff in the practical classes are Honours or Postgraduate students from Botany, Genetics and Zoology. Those appointed to casual demonstrating positions are expected to attend a half-day training session organised within the faculty for all first-year demonstrators.

86. The role of the Director in the Program is mentioned earlier (under the heading 'Role of the Director in the Program'.) This is an appointment agreed to by the three departments. Directors of other large first year classes exist in other departments within Science.

The value of good teaching at first year is well recognised as a means of ensuring students remain at university and continue in the discipline.

## APPENDIX I

Principle 1: An atmosphere of intellectual excitement

Principle 2: An intensive research culture permeating all teaching and learning activities

Principle 3: A vibrant and embracing social context

Principle 4: An international and culturally diverse curriculum and learning community

Principle 5: Explicit concern and support for individual development

Principle 6: Clear academic expectations and standards

Principle 7: Learning cycles of experimentation, feedback and assessment

Principle 8: Premium quality learning resources and technologies

Principle 9: An adaptive curriculum

## APPENDIX II

### **The role of the Biology Coordinator is to:**

1. Liaise with the Heads of Botany Zoology and Genetics in the establishment and implementation of a strategic plan for the Biology Unit.
2. Ensure information flow to all Heads is regular and consistent.
3. Supervise and appraise the Laboratory Manager ensuring effective performance of duties including the supervision and appraisal of staff of the Biology Laboratory.
4. Supervise the original appointment of, probationary period and annual appraisal of the nine part-time Tutors in Biology.
5. Organise regular meetings of departmental coordinators, lecturers and when appropriate Heads of Botany, Genetics and Zoology.
6. Act as a coordinator of all [subjects] of Biology.
7. Oversee the organisation of practical manuals, lecture summaries, tutorial sheets, examination papers by establishing appropriate guidelines and time lines in consultation with the academic staff of three different departments and the laboratory manager.
8. Liaise with lecturers in the preparation of all curriculum materials, presentations of lectures, timetable and assessment.
9. Establish appropriate assessment procedures for practicals and examinations and ensure they are carried out.
10. Ensure the demonstrators and tutors are supplied with the information necessary to discharge their duties and that they are aware of the quality of performance that is expected of them.
11. Conduct surveys as required by the University and/or Faculty of Science and others surveys as appropriate. Disseminate results to convenors and Heads, and where appropriate display results for student access.
12. Establish a staff-student liaison committee and meet regularly. Organise minutes including action responses for staff and students.
13. Ensure up-to-date photographs (with titles) of all academic staff and tutors in biology [subjects] are displayed for students.
14. Establish a protocol for student problems including special consideration. Report action to faculties involved.
15. Represent biology at Orientation, Welcome Day, Parent's Orientation program, faculty staff-student liaison meetings and on other appropriate occasions.
16. Prepare a brief annual report for the Heads of Botany Zoology and Genetics on the above duties for discussion during an annual appraisal round with Heads.

## APPENDIX III

### GENETICS AND THE EVOLUTION OF LIFE: 2007 QUESTIONNAIRE

Please allow us to improve the subject next year. Answer the multiple choice questions below on the *Multiple Choice Form* provided. Please use an HB or equivalent *pencil*. You **do not** need to write your name or student number.

#### GENERAL

1. **I completed Units 3 and 4 of VCE Biology.** A = Yes, B = No
2. **I completed 650141 in:**  
A = semester one 2007, B = in 2006 or earlier, C = not at all
3. **When compared to all other First Year subjects you have taken, how would you rate Biology 650142 overall?**  
A = Excellent, B = Above Average, C = Average, D = Below Average, E = Poor
4. **I work part-time for**  
A = more than 15 hours per week, B = 9-14 hours per week,  
C = less than 9 hours per week, D = not at all

#### LECTURES

5. **When compared to all other First Year subjects you have taken, how would you rate the 650142 Biology lectures overall?**  
A = Excellent, B = Above Average, C = Average, D = Below Average, E = Poor
6. **There were 36 lectures in biology 650142 I attended**  
A = all lectures, B = more than 30, C = 25-29, D = less than 25
7. **How did you find the printed lecture summaries?**  
A = Very useful, B = Useful, C = Average, D = Not useful, E = Not purchased
8. **How did you find the lecture notes on the LMS?**  
A = Very useful, B = Useful, C = Average, D = Not useful, E = Not used
9. **The first 14 lecture recordings have been released. Did you find them**  
A = Very useful, B = Useful, C = Average, D = Not useful, E = Not used

Biology consisted of the lecture sequences below. Please provide a grading of the content and presentation of each component, using the scale: A = Excellent, B = Above Average, C = Average, D = Below Average, E = Poor

10. **Molecular genetics / Patterns of inheritance/ Population genetics**  
(Assoc. Prof Dawn X - Genetics)
11. **Evolution of life / Classification / Kingdoms Protista & Monera Algae / Fungi**  
(Dr Rick X - Botany)
12. **Animal kingdom / Animal diversity / Primates / Evolution & Natural selection**  
(Dr. David X – Zoology)

#### PRACTICALS

13. **When compared to other First Year subjects, how would you rate the Practical component of Biology 650142?**  
A = Excellent, B = Above Average, C = Average, D = Below Average, E = Poor
14. **Practicals 1, 2 and 3 on Genetics were:**  
A = Excellent, B = Above Average, C = Average, D = Below Average, E = Poor
15. **Practicals 4 and 5 on Protists /Fungi and Flowering Plants were**  
A = Excellent, B = Above Average, C = Average, D = Below Average, E = Poor

**16. Practicals 6, and 7 on Animal Diversity were**

A = Excellent, B = Above Average, C = Average, D = Below Average, E = Poor

How would you rate the performance of YOUR Supervising Demonstrator?

A = Excellent, B = Above Average, C = Average, D = Below Average, E = Poor

**17.** Nancy X                      **18.** Sally X                      **19.** Pearl X                      **20.** Suzie X

**21.** Michelle X                      **22.** Ros X                      **23.** Ian X                      **24.** Julia X

**25.** Lyn X                      **26.** Anne X

**27. How would you rate the system of assessing practicals?**

A = Fair, B = Mostly fair, C = Average, D = Sometimes unfair, E = Unfair

**28. In preparation for practicals I read through the practical before the class**

A = always, B = often, C = sometimes, D = rarely, E = never

**29. The practical classes are an effective method of aiding my understanding of practical aspects of Biology.**

A = Strongly Agree, B = Agree, C = Neither Agree or Disagree, D = Disagree, E = Strongly Disagree

## TUTORIALS

**30. How would you assess the relevance of tutorials?**

A = Highly relevant, B = Very Relevant, C = Relevant, D = Somewhat relevant, E = Not Relevant

**31. There were 10 tutorial sessions this semester. How many did you attend?**

A = 9-10, B = 7-8, C = 5-6, D = 3-4, E = less than 3

**32. My Biology tutor is:**

A = Nancy X, B = Sally X, C = Pearl X, D = Suzie X

**33. My Biology tutor is:**

A = Michelle X, B = Ros X, C = Ian X, D = Lyn X

**34. How would you rate the performance of your Biology Tutor?**

A = Excellent, B = Above Average, C = Average, D = Below Average, E = Poor

**35. How often did you visit the Tutor on Duty or a tutor outside your tutorial time this semester?**

A = 5 or more times, B = 2-4 times, C = once, D = not at all

## WEBSITE &amp; EMAIL

**36. I regularly made use of information and materials made available by the teaching staff on the LMS.**

A = Strongly Agree, B = Agree, C = Neither Agree or Disagree, D = Disagree, E = Strongly Disagree

**37. I found the announcements on the LMS useful.**

A = Strongly Agree, B = Agree, C = Neither Agree or Disagree, D = Disagree, E = Strongly Disagree

## COMPUTER SESSIONS

**38. The interactive computer programs were effective in increasing my understanding of Blood Groups / Pedigrees.**

A = Strongly Agree, B = Agree, C = Neither Agree or Disagree, D = Disagree, E = Strongly Disagree

**39. The Virtual fly lab activity increased my understanding of inheritance.**

A = Strongly Agree, B = Agree, C = Neither Agree or Disagree, D = Disagree, E = Strongly Disagree

**40. The interactive computer programs were effective in increasing my understanding of the Living Cell**

A = Strongly Agree, B = Agree, C = Neither Agree or Disagree, D = Disagree, E = Strongly Disagree

**41. The interactive computer programs were effective in increasing my understanding of Biodiversity.**

A = Strongly Agree, B = Agree, C = Neither Agree or Disagree, D = Disagree, E = Strongly Disagree

GENERAL

**42. Are you a student originally from**

A. Melbourne, B. Country Victoria, C. Interstate, D. Overseas

**43. Completing the Mid-semester Test gave me helpful feedback on how I was going in this subject.**

A = Strongly Agree, B = Agree, C = Neither Agree or Disagree, D = Disagree, E = Strongly Disagree

Please tell us about one thing you have enjoyed about this subject.

Please tell us about one thing you have not enjoyed about this subject.

If there was one thing you could change in this subject what would it be?

# APPENDIX IV

## STAFF-STUDENT LIAISON COMMITTEE

### GUIDELINES FOR STUDENT REPRESENTATIVES IN BIOLOGY

Thank you for volunteering to be a student representative for Biology.

Below are some guidelines intended for the use of representatives of the Biology Staff Student Liaison Committee. They are based on the experience of past student representatives and provide a useful guide as to how best to approach this role, which incorporates obtaining feedback from the class, deciding how to deal with the issues raised and delivering a report at the Committee meeting.

In your role as student representatives we would like you to:

1. Collect feedback from the class, before the staff student liaison meetings.
2. Attend up to two informal meetings of the Staff Student Liaison Committee during the semester.

#### OBTAINING FEEDBACK FROM STUDENTS

Feedback may be obtained during a lecture, tutorial or practical class. The practical class is the easiest venue to survey the students. Introduce yourselves at the beginning of the class, asks the Head demonstrator for 2 minutes to do so. This enables an effective appeal for feedback to be made and gives students time to consider their comments, as well as making the class aware of their representative's identity, should they wish to approach them with further feedback at a later time. You can circulate a sheet of paper requesting comments during the class. It is usually most effective to use the paper circulation method, as students may feel unwilling to contribute to general discussion. Some students prepare a questionnaire and hand it around. If you need this photocopied please call at the Biology office with at least 2–3 days notice.

Representatives should aim to elicit comments on issues where appropriate such as:

- program structure
- lecturing style
- pace of lectures
- use of computer presentation/overheads/whiteboards
- practicality of lecture theatres
- program content
- assessment
- practical
- tutorials.

Use the comment sheets to (i) identify the major and important issues for incorporation into your report, and (ii) identify and dismiss 'practical joke' type comments. Before preparing your report, skim the comment sheets to identify the major issues and gain a feel for the class view. Remember to be impartial and objective in this analysis. Your opinion can be brought to the committee meeting but you should be careful to distinguish it from a class view if necessary.

**Remember to encourage positive comments as well as criticism.** Many students hold the misconception that the Committee is designed only as a forum for complaint and the resolution of difficulties, while overlooking its ultimate role of constantly reassessing and striving to improve the quality of programs provided in Biology.

Please note that any problems that may arise from time to time during the semester should be communicated directly to the lecturer. Problems of a sensitive or confidential nature should be communicated to the Director of First Year Studies in Biology, Dawn Gleeson (Room 1.07 Genetics or ph 8344 4765 or email [d.gleeson@unimelb.edu.au](mailto:d.gleeson@unimelb.edu.au)).

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Further resources developed under this ALTC Senior Fellowship, *Articulating a Transition Pedagogy*, are available at <http://www.altcexchange.edu.au/first-year-experience-and-curriculum-design>