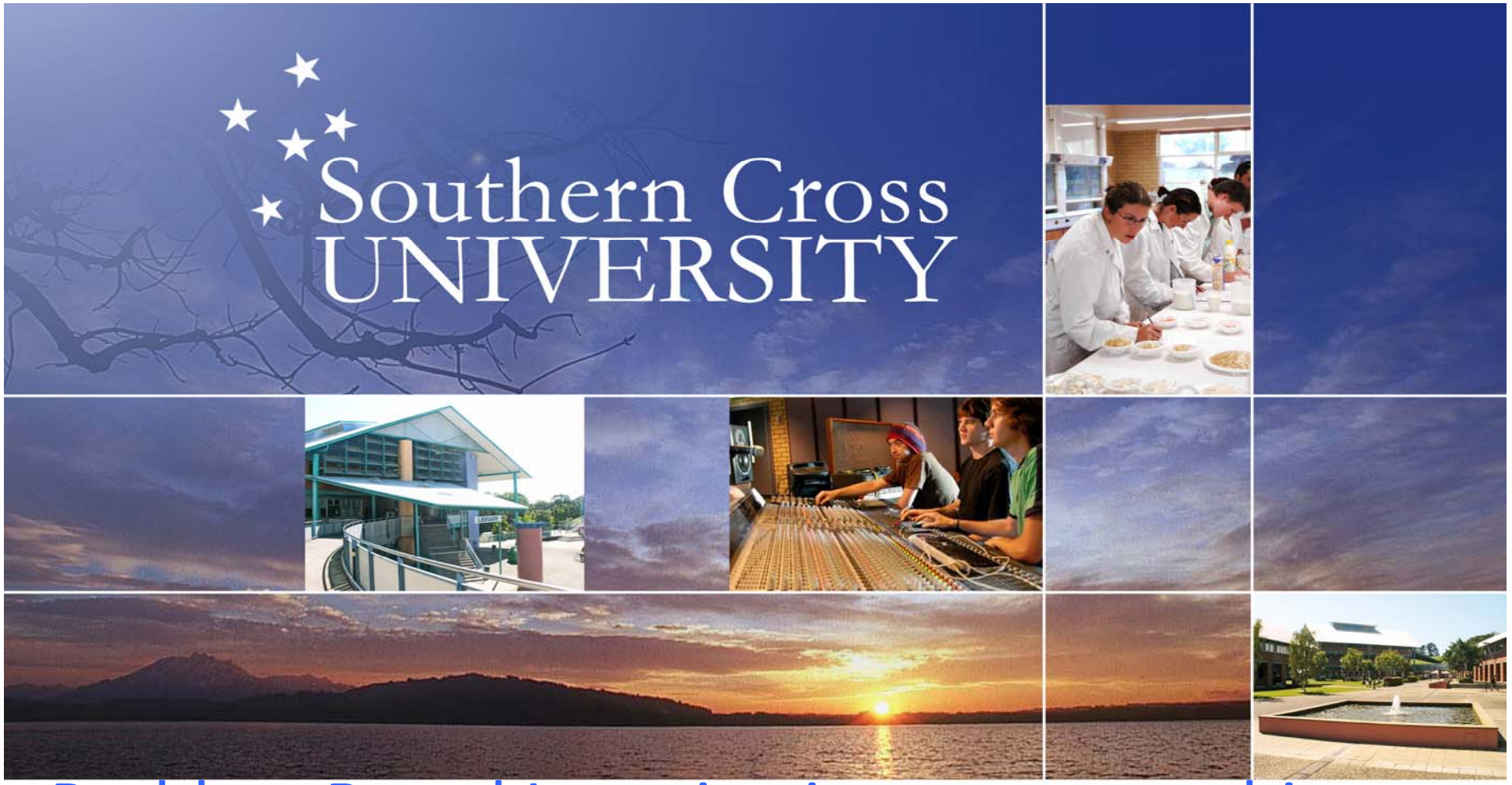

Problem Based Learning in an osteopathic curriculum – report on its suitability and a review of implementation.

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AIMS OF PRESENTATION

1. to report on Problem Based Learning (PBL), a student centred curriculum design, and its suitability as an overarching and integrated framework for a programme in Osteopathic Medicine.
2. to report on the review of the first year of implementation of this design.

Problem? What problem?

- "For every complex problem, there is a solution that is simple, neat, and wrong."
  – HL Mencken

Problem? What problem?

- If you only have a hammer, you tend to see every problem as a nail.
  - Abraham Harold Maslow

Problem? What problem?

A problem, to be a problem, must contain an unknown. If all was known, the problem would vanish. Alan C. Walter

What is the “problem” in osteopathic practice?

- The conundrum, the equation
- Medical practice is linear compared to this chaos!
- The soup in the osteopathic clinical mind
- History + Physical examination = DD
- + investigation = WD
- + BioPsychoSocial aspects (we are all individuals!)
- + evidence of risk/benefit (contradictory and lacking)
- + evidence from experience (low ranking evidence)
- + a dash of osteopathic philosophy
- = trial of management on basis of all of the above!

http://miiccheck.wordpress.com/

Problem Based Learning

- Problem-based learning is a method of student centred learning in tertiary and school education, which involves active learning.
- The defining characteristics of PBL are
  - learning is driven by challenging, open-ended problems;
  - secondly that students work in small collaborative groups; and lastly
  - teachers take on the role as "facilitators" of learning

- Woods, D. (1994) Problem Based learning: How to gain the most from PBL. Hamilton, McMaster University.
- Woods, D. (2003) ABC of learning and teaching in medicine: Problem based learning. British Medical Journal, 326:328-330.

PBL

- PBL must be based on **authentic** problems from practice
- The process initially requires **scholarly inquiry**
- Developing the problems requires input from **practitioners**
- Academics become non-didactic facilitators of learning
- The problems are developed with a **framework /concept mapping** process

Began 1960's at McMaster University Medical School

Aim to better prepare graduates who could think critically and solve complex clinical problems.

PBL

Sometimes categorised as an **experiential** approach

(Camp, G. (1996) Problem-Based Learning: a paradigm shift or a passing fad? Medical Education Online: 1:2.).

Experiential Curriculum is:

- student centred,
- coherent and relevant to context.
- analyses whole to part organisation of knowledge.

Experiential Teaching is seen as:

- facilitating learning as constructing meaning
- the learning environment is flexible.

PBL positives

PBL can, regardless of discipline, enhance students' achievement of:

- Adaptation and participation in change
- Application of problem solving in new and future situations
- Creative and critical thought
- Adoption of holistic approach to problems and situations
- Appreciation of diverse viewpoints
- Successful team collaboration
- Identification of learning weaknesses and strengths
- Promotion of self-directed learning
- Effective communication skills

PBL positives

- Augmentation of knowledge base
- Leadership skills
- Utilisation of relevant and varied resources
- adult learners have a self-concept of being responsible for their own decisions, and need to be seen by and treated as being capable of self direction

- Barrows H.S. & Tamblyn R.M. (1980) Problem-Based Learning: An Approach to Medical Education. New York.
- Engel, J. (1991) Not Just a Method But a Way of Learning. In: The Challenge of Problem-Based Learning, Boud and Felletti, eds. pp. 21-31, New York: St. Martin's Press Springer.
- Crawford TR. (2011) Using problem-based learning in web-based components of nurse education Nurse Education in Practice 11 (2011) 124-130.

PBL positives

Diane Woods (2003), from McMaster University:

- enhanced communication skills,
- respect for others,
- independent responsibility for learning,
- a method where acquisition of knowledge occurs alongside the development of generic skills and attitudes.

- She also reviewed the worldwide practice, and states that usually it is part of an integrated curriculum, where some lectures are given for difficult topics.

- Woods, D. (2003) ABC of learning and teaching in medicine: Problem based learning. British Medical Journal, 326:328-330.

PBL positives

PBL students showed significantly greater improvement in

- overall Critical Thinking Disposition Inventory (P = 0.0048),
- Truthseeking (P = 0.0008),
- Analyticity (P = 0.0368),
- Critical Thinking Self-confidence (P = 0.0342) and
- Systematicity (P = 0.0440)

- Tiwari A., Lai P, So M, Yuen K. (2006) A comparison of the effects of problem-based learning and lecturing on the development of students' critical thinking. Medical Education, 40:6, 547-554.

PBL positives

- Highly effective for the challenge of integration of the sciences amongst themselves and science into practice.
- Alavi, C. (Ed) (1995) Problem Based Learning in a health science curriculum. Routledge, London.
- Graduates of the problem-based school compared to conventional school rated themselves:
  - better interpersonal skills,
  - better competencies in problem solving, self-directed learning and information gathering,
  - better ability to work and plan efficiently.
  - no sizeable differences with regard to general academic competencies, such as conducting research or writing a paper.
  - Schmidt HG, Vermeulen L, Van Der Molen HT. (2006) Longterm effects of problem-based learning: A comparison of competencies acquired by graduates of a problem-based and a conventional medical school. Medical Education, 40:6;562-567.

PBL negatives and cautions

- Teacher skill – tutors who are accustomed to delivering content find the facilitation role frustrating;
- Human resources – more staff are required because of the smaller tutorial groups;
- Library and learning resources – are often accessed at the same time by the same group of students, so multiple copies and/or users are required;
- Role models – not all students gain access to all the teachers, as would happen if all attend the one lecture by a particular specialist; Information overload – students can become unsure how much self directed study and information is relevant.
- Woods, D. (2003) ABC of learning and teaching in medicine: Problem based learning. British Medical Journal, 326:328-330.
- Conflicting results were returned about the use of group work in PBL.
- Crawford TR Nurse Education in Practice 11 (2011) 124-130 Using problem-based learning in web-based components of nurse education

PBL negatives and cautions

- Staff training and ongoing professional development was seen as vital to ensure smooth transition, as many academics resist change.
- Tutors need to be highly skilled communicators and managers of groups, and comfortable with the content, but not necessarily a content expert.
- Student selection was seen as requiring change in approach, as certain learners suit this style of education, and straight grade selection process is not necessarily sensitive to choosing the independent learner.
- The Teaching and Learning academic support group should be involved early and in an ongoing mentoring role for the academics.

Aldred, SE., Aldred, MJ., Walsh, LJ., Dick, B. (1997) The Direct and Indirect Costs of Implementing Problem Based Learning into Traditional Professional Courses Within Universities. DEETYA, Commonwealth of Australia.

PBL negatives and cautions

- When PBL is used as an undergraduate study method, there is inconclusive evidence that knowledge of basic sciences is less

  Albanese, M.A. & Mitchell, S. (1993) Problem-based learning: a review of literature on its outcomes and implementation issues, Academic Medicine, 68, pp. 52-81. .

- students who have studied in a PBL style do not perform as well on traditional style exams, although it is argued that these are not effective measures of their performance

  Major, CH., Palmer, B. (2001) Assessing the effectiveness of Problem Based Learning in Higher Education: Lessons from the literature. Academic Exchange Quarterly 5:1.

- Interdisciplinary barriers can reduce the effectiveness of PBL, as this approach requires cross disciplinary networks for assessment, and science teachers who understand the clinical relevance of content

  Kumar, R., Bandaranayake, R. (2001) Workshop Report: basic medical sciences and problem based curricula. Focus on Health Professional Education: a Multidisciplinary Journal, 3:1:66-71.

PBL versions

- *Problem, problem, problem*.
  used from the course beginning to end.
  focus on the discovery of knowledge and skills.

- *Specific problem, specific problem, comprehensive problem.*
  used from the course's start to finish.
  revolve around the students' integration of knowledge and skills.
  final comprehensive problem

- *Level A problem, Level B problem, Level C problem*.
  developing critical thinking, problem solving skills and decision making skills
  simple, easily completed problems occur at the onset of the course
  build in complexity

PBL versions

- *Problem, Lecture, Problem, Lecture.*
  discover the need for specific knowledge.
  A problem needing specific knowledge is followed by lecture(s).
- *Case study, problem.*
  a decision-making case study that guides the student in finding necessary resources opens the course.
  problems where students must identify learning issues and resources are presented.

- There are many hybrid models of PBL, and many curricula combine forms of this style, and are therefore not considered “pure” forms of the method.

- Camp, G. (1996) Problem-Based Learning: a paradigm shift or a passing fad? Medical Education Online: 1:2.

Course design

A linear model of the process of course design is outlined as stages 1 to 6 in Toohey

Toohey,S. (2002) Designing Courses for Higher Education. The Society for Research into Higher Education and Open Learning, Fig 2.1:

Stage 1 Establish need and demand for course

⇓

Stage 2 Establish student characteristics

⇓

Stage 3 Determine content

⇓

Stage 4 Set goals and objectives

⇓

Stage 5 Choose teaching and assessment methods

⇓

Stage 6 Implement, evaluate and adjust components accordingly

Stage 2 - students

- Demographics
  - 30 students per year, completed the feeder degree
  - school leavers less than 20%
  - Mature learners are often very goal oriented and self aware, and are strongly concerned with value for time and money
  - Rowntree, D. (1992) Open learners and their learning. Exploring Open And Distance Education. London, Kogan Page.
- Motivation
  - primarily to gain an accredited qualification to practice clinically as an Osteopath - might be a second vocation
  - strongly *vocationally extrinsic*, in that the outcome is not intrinsically academic or personal (Rowntree, 1992).
  - will question “Of what relevance is this content for the vocational outcome?”

Students

- Learning factors - broad mixture of backgrounds of previous study
  - Rowntree (1992) proposes four conceptions of learning:
    - 1 Memorising
    - 2 Understanding
    - 3 Application
    - 4 Personal Development.
- Examples and anecdotes from personal experience will be important - the *learners as contributors* method (Rowntree, 1992), to enhance accessibility and validity of the content
- Resource factors
  - time pressure to fit in part time employment/other commitments.
  - They will need a study timetable that allows these aspects in order to progress.
  - They will also demand value for money.

Stage 4 – set goals and objectives

The drivers for this programme objectives and content come from three sources:

1. Southern Cross University generic Graduate Attributes (Strategic Plan 2005-2010),

2. Osteopaths Registration Board accreditation guidelines (Osteopaths Registration Boards of Australia, Accreditation Policy, 2004)

3. Educational aims and philosophy of the course development team.

Conclusion

- A hybrid model of PBL was found to match the stakeholder demands
- The portions of the curriculum highly suited to PBL included
  - the research project and the development of critical reasoning,
  - the medical specialties,
  - clinical osteopathic medicine,
  - rehabilitation practice,
  - pharmacology,
  - nutrition and lifestyle therapy.
- Other portions of the proposed curriculum do not suit pure PBL included
  - osteopathic technique,
  - psychology and counselling skills, and
  - the theoretical basis of advanced diagnostic processes, rehabilitation and exercise therapy.

Implications

- Supportive training in self directed learning is important to enable a broad range of students to succeed
- Students require substantial foundation training in case based reasoning before attempting a PBL approach to learning.
- it is advisable to ensure a close match of delivery style to the specific content area.

PBL mentioned in the osteopathic literature?

- Lake Erie College of Osteopathic Medicine
  - three learning pathways—traditional, independent study, and problem-based
  - Pre-clinical curriculum
    - Chegwidden WR. (2006) A Problem-Based Learning Pathway for Medical Students: Improving the Process Through Action Research. Ann Acad Med Singapore 2006;35:642-6.
    - Ferretti,S; Krueger,WA; Gabel,LL; Curry, JJ. (2007) Lake Erie College of Osteopathic Medicine's Preclinical Problem-Based Learning. JAOA, 107:10.

- PBL is an appropriate strategy for the integration of EBM and critical thinking into osteopathic training
    - Fryer G. Teaching critical thinking in osteopathy - Integrating craft knowledge and evidence-informed approaches. International Journal of Osteopathic Medicine 11 (2008) 56-61

How we set up the PBL curriculum

- Presented the PBL concept to the accreditors, with positive response;
- Ran staff in-service seminars;
- Workshopped cases with clinical educators and academic staff;
- Mapped the course objectives to subjects
  - Matching the appropriate objectives to PBL subjects
- Mapped the subjects objectives to cases
  - Ensuring all objectives are covered by the cases

Framework for mapping of course objectives

COURSE OBJECTIVE	OSIX	OM1	CPR1	OSX	OM2	CPR2	OSXII	OM3	CPR3	OSXII	OM4	CPR 4
(Eg Dept) Integration of the holistic philosophy of health and the science of medicine,		√	√		√	√		√	√		√	√
(Eg Dept) High quality clinical training, developing independent practice and advanced teamwork skills,			√			√			√			√
Eg Reg Brd)The principles of health education; disease prevention; amelioration of pain, suffering and disability; rehabilitation; the maintenance of health and the minimization of disability in old age		√			√			√			√	
Eg Reg Brd) The recognition of and timely referral for joint or separate care of patients with conditions for which osteopathic treatment is inadequate or where it will delay urgently needed medical or other care		√	√		√	√		√	√		√	√

Framework for mapping of PBL unit objectives

Unit objective (core concepts) Eg Osteopathic Medicine 1	CASE 1	CASE 2	CASE 3	CASE 4	CASE 5	CASE 6
Identify the signs and symptoms of disease in patient presentations in the orthopaedic system, •demonstrate an understanding of the diagnostic processes in this system, including physical examination, laboratory and imaging technologies. * Construct management of patient cases based on an integrated diagnostic process	√	√				
Identify the signs and symptoms of disease in patient presentations in the rheumatological system, •demonstrate an understanding of the diagnostic processes in this system, including physical examination, laboratory and imaging technologies. * Construct management of patient cases based on an integrated diagnostic process			√	√		
Identify the signs and symptoms of disease in patient presentations in the neurological system, •demonstrate an understanding of the diagnostic processes in this system, including physical examination, laboratory and imaging technologies. * Construct management of patient cases based on an integrated diagnostic process					√	√
Critically explore the integration of the osteopathic concept of health and disease with the diagnostic processes	√	√	√	√	√	√

Results from student feedback and performance 2010

- The PBL learning method performed strongly overall in terms of student feedback and performance, but there was a broad range.
- Core issues with the design reflect the literature on PBL:
  - that the learning was authentic and reflects practice,
  - that the workload was high and
  - that some students requested more content delivered as didactic lectures.

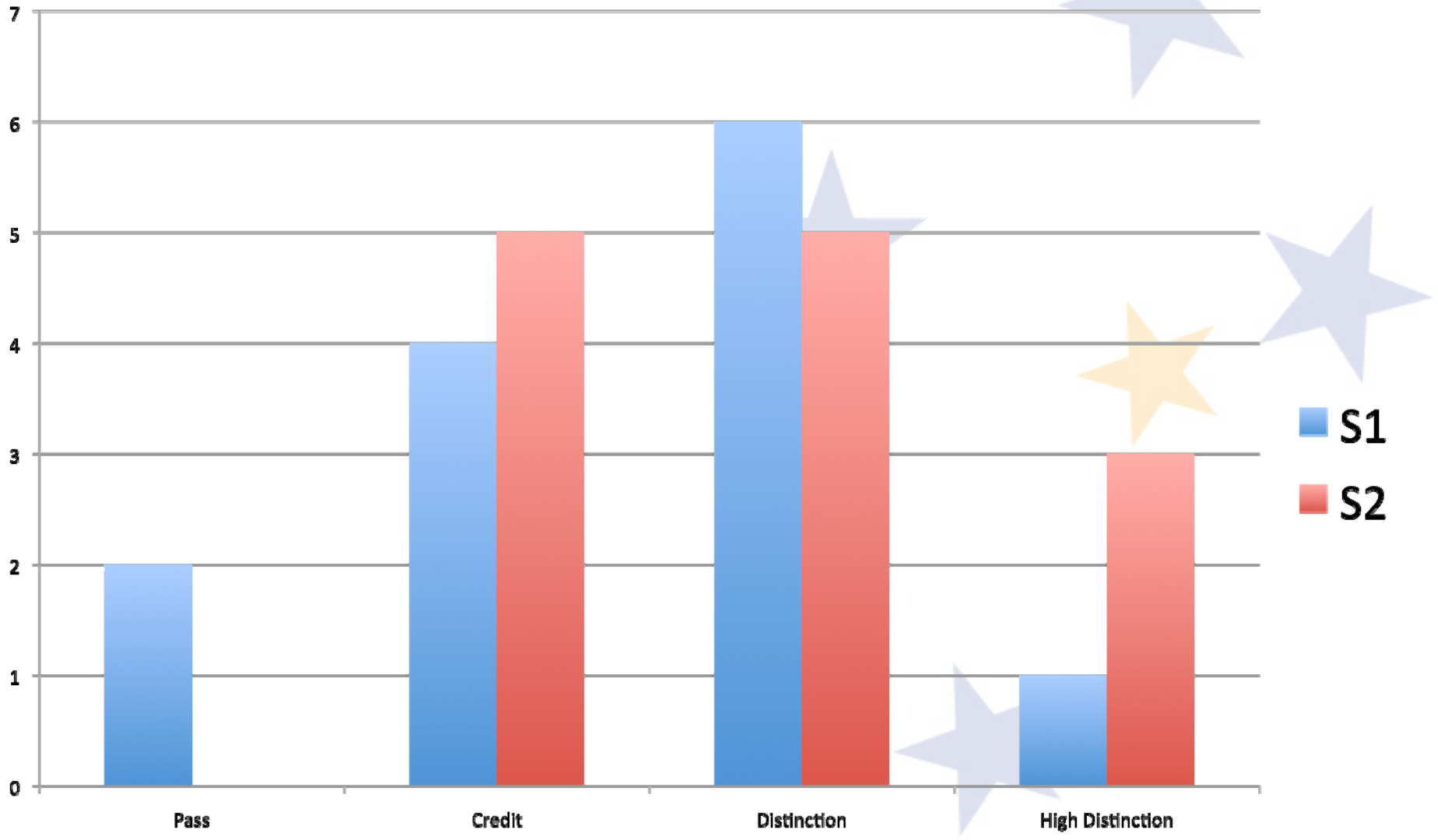
Student comments

- “the amount of time needed to fulfill the required tasks far exceeded the time allotted for each weeks cases.
- the time frame was to be about 6 hours per case and they ended up taking between 10 & 12 hours per case.
- I feel the same time could be spent more efficiently. Eg, a DDx list pre semester of all the topics we should be learning. I am concerned i will miss key topics.
- there was lots of discussion/tangents in terms of hypothetical situations that may never happen and that took up lots of time and were unbeneficial to our learning.
- The content delivered lacks a depth to be able to competently perform as a primary health care practitioner and that it was all covered in a overview format.”

Changes made between semester 1 and 2

- Cases online earlier in session
- DD list for semester compiled and distributed
- More feedback given on the tutorial assessments
- Appropriate room booked
  - Flat room with desks and wireless
  - Movable chairs
  - Nowhere to hide!

Results semester 1 and 2



Thanks - all welcome to visit SCU