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Leap into...

Student-centred Learning

This publication is designed for University of Adelaide staff who are interested in student-centred learning—what it is and how it can be put into practice to enhance learning and teaching. We've tried to create a picture of student-centred learning that is broad and general enough to be useful to teachers in many, if not all disciplines, and with an eye to the variety of teaching settings, from the lab to the large lecture theatre to the studio and more.

This publication was originally researched and written by Christine Ingleton, Margaret Kiley, Robert Cannon and Tim Rogers.



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 *Go to Start*  *Previous Page*  *Next Page*  *Go to End* and  *Exit/Close this document.*

Press **Esc** to return to PDF Reader. Press **Ctrl/Q** to close the document & Reader.

CONTENTS

[SCL Introduction](#)

[What is SCL?](#)

[Why SCL?](#)

[Know your students](#)

[Learning outcomes](#)

[Strategies](#)

[Assessment](#)

[Evaluation](#)

[Resources](#)

[References](#)

Introduction

The table below describes the aspects of student-centred learning included under each menu headings in the contents menu to the left.

What is SCL?	A brief description.
Why SCL?	A brief rationale.
Know your students	Who are they? What is their academic, cultural and social background? What are their existing skills and knowledge? Why are they here?
Identify and communicate clear learning outcomes	Students develop skills of self-managed, independent learning in an environment that provides clear expectations and appropriate resources.
Use learning and teaching activities designed to achieve the desired learning outcomes	Focus on what the student does. Good practice encourages active learning, co-operation and collaboration among students and prompt feedback from staff. Real-world problems, authentic tasks, relevant applications and a degree of choice enable students to be more active learners.
Assess for achievement of desired learning outcomes	Students have a more active role in: negotiating assessment tasks, self-assessment, and peer assessment.
Evaluate specific aspects of student-centred learning	Use formal and informal means to evaluate the effectiveness of student-centred teaching initiatives.

CONTENTS

- SCL Introduction
- What is SCL?
- Why SCL?
- Know your students
- Learning outcomes
- Strategies
- Assessment
- Evaluation
- Resources
- References

What is SCL?

Although there are many definitions of student-centred learning, the essence is encompassed in the following:

Student-centred learning describes ways of thinking about learning and teaching that emphasise student responsibility for such activities as planning learning, interacting with teachers and other students, researching, and assessing learning.

Cannon, (2000)¹

Student-centred learning has student responsibility and activity at its heart, in contrast to the stronger emphasis on teacher-control and the coverage of academic content found in much conventional, didactic teaching (Cannon 2000¹).

Student responsibility and independence help to develop characteristics of lifelong learners—motivation, self-evaluation, time management and the skills to access information. Research in student learning underscores the importance of concentrating on what learners do, and why they think they are doing it, rather than what the teacher does (Biggs 1990², Biggs 1999³, Shuell 1986⁴). **Problem-based learning** is an outstanding example of student-centred learning in higher education.

CONTENTS

[SCL Introduction](#)

[What is SCL?](#)

[Why SCL?](#)

[Know your students](#)

[Learning outcomes](#)

[Strategies](#)

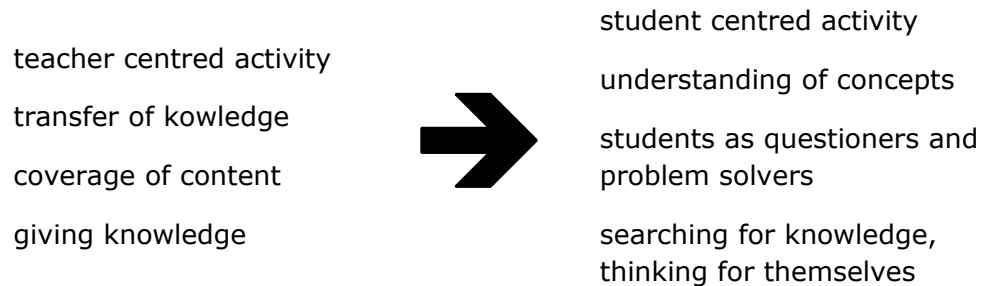
[Assessment](#)

[Evaluation](#)

[Resources](#)

[References](#)

With a student-centred approach more is demanded from students than learning course content in order to pass an exam. If 'learning for the exam' is the kind of learning that got them into university, then student-centred learning strategies can threaten students' sense of competence or security if they are not sure exactly what learning is required and why. Different aspects and styles of teaching can be placed along the following continua:



The focus on student learning and responsibility means, however, that teaching staff have an even greater responsibility for providing learning outcomes, assessment and evaluation that support the students as independent learners.

CONTENTS

- SCL Introduction
- What is SCL?
- Why SCL?
- Know your students
- Learning outcomes
- Strategies
- Assessment
- Evaluation
- Resources
- References

Why SCL?

Why focus on Student-centred learning?

To say that the purpose of colleges [universities] is to provide instruction is like saying that General Motors' business is to operate assembly lines or that the purpose of medical care is to fill hospital beds. We now see that our mission is not instruction but rather that of producing learning with every student by whatever means work best.

Barr and Tagg, (1995)⁵

If learning, rather than instruction, is at the heart of the enterprise of higher education, then the weight of empirical findings decidedly supports the use of active, student-centred approaches over passive, teacher centred strategies (Barr and Tagg 1995⁵, Hartley 1998⁶, Ramsden 1992⁷). Teachers who believe their job is to cover their course systematically by transmitting information to students are more likely to encourage surface learning approaches among their students, where retention is temporary, generalisation of knowledge poor and learning how to learn is minimal. On the other hand, teachers who encourage student involvement in the learning process and focus on the quality of learning outcomes are more likely to encourage cognitively deeper and richer learning experiences for their students (Newble and Cannon 1995⁸).

In short, by focussing on instruction rather than learning, universities have confused means with ends (Barr and Tagg 1995⁵), and created institutions that foster and promote the least effective methods for student learning.

CONTENTS

[SCL Introduction](#)

[What is SCL?](#)

[Why SCL?](#)

[Know your students](#)

[Learning outcomes](#)

[Strategies](#)

[Assessment](#)

[Evaluation](#)

[Resources](#)

[References](#)

"But I have a large class, am constrained by the Faculty/Department, have no support, etc."

These and other structural impediments are real, and we do not want to appear to be implying that they can be wished away. Also, we recognise that teachers have different levels of experience, and various interests in the student-centred approach. We have tried to include strategies and examples in this publication aimed at adjustments that can be incorporated into almost any setting, and appeal to as wide a group of potential users as possible.

"Why is there so much talk about student-centred learning now?"

Student-centred learning, while not new, has come into prominence because:

- **Mass:** universities are no longer catering to elite student populations.
- **Diversity:** we have large numbers of non-traditional and international students.
- **Competition:** we are competing for students as never before.
- **Employment:** there is great pressure to align the outcomes of university education with useful generic skills and jobs.
- **Information explosion:** with the explosion of accessible information and knowledge, how people learn and manage information is becoming an essential outcome of a university education and sometimes more important than what they learn, especially when the shelf-life of information may be so short.
- **Research:** we have a growing understanding of how students learn
- **Practice:** the strong impact of values and departmental practices in shaping student learning.

CONTENTS

- [SCL Introduction](#)
- [What is SCL?](#)
- [Why SCL?](#)
- [Know your students](#)
- [Learning outcomes](#)
- [Strategies](#)
- [Assessment](#)
- [Evaluation](#)
- [Resources](#)
- [References](#)

Know your students

Know your students

There is now a large body of research ([Bain 1994⁹](#), [Biggs 1999¹⁰](#), [Entwistle 1991¹¹](#), [Meyer & Boulton-Lewis 1997¹²](#), [Trigwell & Prosser 1991¹³](#)) that demonstrates the link between students' previous experiences and motivation and their performance as learners. Tapping into this information we are in a better position to assist students by increasing relevance and thereby enriching understanding.

Previous experiences influence students' views of learning and the way they approach their learning. These experiences are also strong influences on their motivations for learning. Where students are motivated to come to an understanding of, and engage with the material with which they are presented, they are more likely to adopt strategies that will lead to deeper levels of learning compared with students who are motivated to pass the exam only. We connect best with students, and they with us, if we know a little about who they are, their previous experiences and their understanding of our subject. What are our students' backgrounds, and what do they already know?

CONTENTS

[SCL Introduction](#)

[What is SCL?](#)

[Why SCL?](#)

[Know your students](#)

[Learning outcomes](#)

[Strategies](#)

[Assessment](#)

[Evaluation](#)

[Resources](#)

[References](#)

Getting to know students:

- opens communication
- builds rapport between students and staff
- reduces alienation and disruptive behaviour in large groups.

To tap into your students' motivation, know their aspirations. Are they merely wanting to pass? Or do they want to go on to postgraduate research? Are they aware of the possibilities of where their course can lead them? Of course many motivations will exist in most classes. Build on relevant student experience in the class—it could be cultural, geographic, work-based, or practical knowledge of the implications of a theory or related concepts from other disciplines.

(See a Leap case study from [Dentistry](#), where the students set their learning aims and record their experiences in journals; see an example in [Law](#), where the students learn to work with their own understanding and knowledge first.)

Tip!

In a small group:

Ask the students to interview someone next to them that they don't know, asking why they chose the class, what they hope to get out of it and what they already know about the subject matter. Each student then introduces their interviewee to the whole class.

Tip!

In large lecture groups:

In the first or second lecture try using small 'buzz' groups to briefly summarise their present knowledge of the subject and share this with the whole group

CONTENTS

[SCL Introduction](#)

[What is SCL?](#)

[Why SCL?](#)

[Know your students](#)

[Learning outcomes](#)

[Strategies](#)

[Assessment](#)

[Evaluation](#)

[Resources](#)

[References](#)

Learning Outcomes

Identify and communicate clear learning outcomes

Clear learning outcomes, when made explicit to students, enable them to appreciate what is expected of them and how they might know what they have achieved. In addition, when learning outcomes are specifically assessed and feedback provided to students, this demonstrates to students the importance of the desired learning.

In student-centred learning it is very important to develop course objectives which will drive student learning goals and assessment. This means that learning outcomes are written in a way that describes what the student will be able to do, and know, as a result of their experiences. Learning outcomes also need to be written in ways that enable learning to be assessed.

CONTENTS

[SCL Introduction](#)

[What is SCL?](#)

[Why SCL?](#)

[Know your students](#)

[Learning outcomes](#)

[Strategies](#)

[Assessment](#)

[Evaluation](#)

[Resources](#)

[References](#)

One standard way of tackling the development of course objectives is to work out what you would like the students to have acquired by the end of the course in terms of knowledge, skills, and attitude.

- **Knowledge** refers to subject content. Specific examples for your discipline might include the design and function of a dwelling, Australian coastal environments, and the causes of the French Revolution
- **Skills** refers to abilities. These may include conducting interviews, identifying flora or fauna, writing essays, and designing websites
- **Attitudes** refers to the thought processes involved in deploying the skills. Examples include the importance of critical thinking, the significance of active listening, a proactive attitude towards learning, and respect for the opinion of others.

Verbs used in learning outcomes that encourage deeper levels of understanding by students include reflect, hypothesise, relate, argue, theorise, explain, analyse (Biggs 1999, pp 47-55¹⁰). For example *Analyse* the causes of the French Revolution versus *Name* the causes of the French Revolution.

Students' assignments need to show you how well students are going about processes such as solving problems, making models, writing academically, critiquing what they read, applying principles, and thinking about concepts.

See 'developing objectives' in the [Leap into... Problem-based Learning](#) document.

CONTENTS

[SCL Introduction](#)
[What is SCL?](#)
[Why SCL?](#)
[Know your students](#)
[Learning outcomes](#)
[Strategies](#)
[Assessment](#)
[Evaluation](#)
[Resources](#)
[References](#)

Strategies

Use flexible learning and teaching strategies to achieve learning outcomes

Once we have decided what students need to know, we need to design learning activities that allow students to demonstrate what and how they are learning. One of the fundamentals of good teaching is to move from the known to the unknown. This enables students to develop their understanding in terms of what they already know, allowing them to construct and climb a 'scaffold' of understanding. Of course, building on the students' current understandings requires [knowing them](#).

In addition to the examples below other forms of student-centred learning have their own 'prism' through which learning, and learning about learning, takes place. The element they share in common is the emphasis on student self-responsibility. This means that resources such as lectures and textbooks are viewed as a means to an end that the students can draw on when needed. The essential point, independent of the technique used, is to facilitate self-managed learning.

Real world problems

One of the reasons [problem-based learning](#) is such a good example of a student-centred learning approach is that the problem focus is ideally on a real-world problem, with all the difficulties and excitement that follow. A real-world problem can motivate students and introduce them to new dimensions of the acquisition of knowledge: problems are not always technical, they may have human and social components as well.

CONTENTS

[SCL Introduction](#)

[What is SCL?](#)

[Why SCL?](#)

[Know your students](#)

[Learning outcomes](#)

[Strategies](#)

[Assessment](#)

[Evaluation](#)

[Resources](#)

[References](#)

Problem-solving motivates learning, requires students to think, to generate questions and find information. Knowledge acquisition becomes a means to an end, that of understanding and application, rather than a means to the brief and short-lived end of passing exams. Problem-solving encourages these outcomes:

- learning the multi-dimensional nature of problems
- learning how to balance and design solutions with multiple constraints
- learning when they need new knowledge and skills to achieve a solution.

When students have developed the skills for discovering when they don't know enough, and are confident to take control of acquiring that missing knowledge, they have taken a large step towards lifelong learning.

Assignments

Students are more involved and challenged when:

- working on a project (see a Leap case study from [Engineering](#))
- designing their own experiment (see a Leap case study from [Physiology](#))
- setting their own research topic or essay (see a Leap case study from [Anthropology](#))
- dealing with a problem and generating their own questions about it rather than staff doing it for them (see [problem-based learning](#))
- reflecting on their learning. Journals are being used increasingly to encourage students to reflect on how they see its applications, and to give feedback to staff on students' understanding and reaction to topics (see a Leap case study from [Dentistry](#)).

CONTENTS

[SCL Introduction](#)

[What is SCL?](#)

[Why SCL?](#)

[Know your students](#)

[Learning outcomes](#)

[Strategies](#)

[Assessment](#)

[Evaluation](#)

[Resources](#)

[References](#)

Lectures

Are there better ways of students gaining information than by listening for long periods? (We know how short attention spans are.) What can they learn from a lecture that they can't learn in some other way? Many students would find it more efficient to read the information, or be set assignments that require them to find answers, demonstrate their understanding or learn from each other. That can free lecturers to use contact time differently. Consider the contact hours or opportunities you have with your students as a total package, rather than as lectures, tutorials and so on. Several departments have collapsed contact hours to construct workshop/lab/tutorial/input times in a far more coherent fashion, or have changed seminars into interactive sessions where students learn to manage discussions, debate constructively and teach each other. (Relevant examples on Leap: [Studio classes](#) in Physics, [Role playing](#) in Law, [Group projects](#) in Electronic & Electrical Engineering).

If you do have a large lecture group, you can overcome some of its inherent difficulties by getting feedback on how well students are understanding the key concepts and tailoring future lectures or tutorials as a response (see how Derek Abbott in [Electrical Engineering](#) uses this approach).

Another approach is to split the larger group by devolving responsibility to students. (See an example from [History](#); [Medicine](#) has even used this approach for a Problem-based learning course).

CONTENTS

[SCL Introduction](#)

[What is SCL?](#)

[Why SCL?](#)

[Know your students](#)

[Learning outcomes](#)

[Strategies](#)

[Assessment](#)

[Evaluation](#)

[Resources](#)

[References](#)

Tutorials

Tutorials have traditionally been considered opportunities for students to gather in smaller groups so that they can interact with each other and address subject material in greater depth. Increasingly they are now larger groups where some of the benefits of interaction have been diminished. For an example of a method for retaining the benefits of the smaller group when the tutorial sizes balloon see '[Supertutes](#)' as used in Applied and Molecular Ecology.

(Other examples of ways to facilitate the students' active involvement with the subject knowledge being taught: [Chris Mortensen](#), Philosophy, has developed a simple but effective method for encouraging tutorial participation; [Yvonne Bone](#), Geosciences, has used a class debating method; [Deane Fergie](#) uses a puzzle to help students come to grips with the conceptual skills needed for the Social Sciences; and [Robert Hirsch](#) has developed a board game for Dentistry.)

Using IT

Many software packages can be used to give students practice, test themselves, self-evaluate, extend and challenge their understanding (See [Testpilot](#)). They can encourage students to help each other, and come to lecturers for help only after they have worked at the problem and sought help from others first. [Derek Abbott](#) in Electronic and Electrical Engineering likes to communicate with students by email; others set up chat groups on specific topics to generate questions and answers among students (for example [Mike Keller](#) in Applied and Molecular Ecology and [Catherine Driscoll](#) in English Studies). The most successful use of IT is probably where students learn to ask questions and to learn from each other so that personal learning networks are established and supported by staff.

CONTENTS

[SCL Introduction](#)

[What is SCL?](#)

[Why SCL?](#)

[Know your students](#)

[Learning outcomes](#)

[Strategies](#)

[Assessment](#)

[Evaluation](#)

[Resources](#)

[References](#)

Teamwork

One of the most common strategies used in a student-centred approach is for students to work in groups or teams. Not only is this an effective way for students to learn, but in work, family life and leisure activities the ability to work in teams is essential for most people, and it is one of the generic skills highly sought by employers. Learning in teams can be very effective, but teaching the requisite skills can be difficult. Teamwork involves process skills that must be taught and monitored, in addition to the content of the course.

CONTENTS

[SCL Introduction](#)
[What is SCL?](#)
[Why SCL?](#)
[Know your students](#)
[Learning outcomes](#)
[Strategies](#)
[Assessment](#)
[Evaluation](#)
[Resources](#)
[References](#)

Assessment

Assess for achievement of the specific learning objectives

The best forms of assessment are aligned with the learning goals and the teaching methodologies we use and are designed to give feedback to students. We need to harness assessment to encourage the sort of learning outcomes we are seeking. In student-centred learning we are emphasising knowledge, attitudes and skills such as:

- responsibility for one's own learning
- independence and co-operation
- problem-solving
- understanding
- thinking for oneself.

Assessment drives learning more than anything else because it represents the bottom line of students' performance. All assessment methods require that students present evidence of their learning, yet in most cases (with the thesis and project work being notable exceptions) it is the teacher who controls the character of that evidence.

CONTENTS

[SCL Introduction](#)

[What is SCL?](#)

[Why SCL?](#)

[Know your students](#)

[Learning outcomes](#)

[Strategies](#)

[Assessment](#)

[Evaluation](#)

[Resources](#)

[References](#)

If we really believe in student-centred learning then we must work hard to ensure that our assessment practices reflect, encourage, and reward this belief. We need to be constantly aware of any discrepancies between what we are asking students and what we really want to know.

We need to use forms of assessment that will show evidence of these, otherwise students get the message that we don't take such goals seriously.

Student-centred learning is encouraged by the use of formative assessment and criterion-referenced assessment:

- **Formative assessment** is assessment for the purposes of gathering feedback on learning and does not usually contribute to a grade. Assessment for grading purposes rather than feedback is called summative assessment.
- **Criterion-referenced assessment** measures students against the learning criteria in the course, unlike norm-based assessment which measures students against other students.

One of the benefits of criterion-referenced assessment is that both teachers and students can more easily see where students are succeeding and where they are not, which can be invaluable in improving the course for its next offering.

CONTENTS

[SCL Introduction](#)

[What is SCL?](#)

[Why SCL?](#)

[Know your students](#)

[Learning outcomes](#)

[Strategies](#)

[Assessment](#)

[Evaluation](#)

[Resources](#)

[References](#)

Forms of assessment

One of the main reasons for using exams is to ensure that we are seeing the students' own work. However, to assess the learning outcomes that are not reliant on short-term memorising, a range of assessments can be used during the semester. The following table ([adapted from Main 1993¹⁴](#)) indicates a range of assessments that capture some of this information.

Form of assessment	Example of objectives
Take-home essay or assignment	<ul style="list-style-type: none"> • prepare arguments and analysis • seek relevant information • organise effective presentation • integrate ideas or theories • express ideas in appropriate manner
Open book examination	<ul style="list-style-type: none"> • retrieve information and ideas from sources • reference material adequately • apply information to relevant situations • remember key ideas or structures
Questions or assignments proposed by students, approved by staff	<ul style="list-style-type: none"> • show knowledge of course aims • display understanding of structure or materials • display understanding of key issues

CONTENTS

[SCL Introduction](#)
[What is SCL?](#)
[Why SCL?](#)
[Know your students](#)
[Learning outcomes](#)
[Strategies](#)
[Assessment](#)
[Evaluation](#)
[Resources](#)
[References](#)

Form of assessment	Example of objectives
Project work	<ul style="list-style-type: none"> • seek information • reason • plan study in appropriate depth • organise information for special purposes • present ideas • be original • sustain appropriate motivation
Coursework (continuous assessment)	<ul style="list-style-type: none"> • maintain appropriate motivation • participate in work of class • develop techniques appropriate to course goals • sustain interest or energy • relate different tasks to each other
Oral communication	<ul style="list-style-type: none"> • cope with questions and arguments • show reasoning behind statements or ideas • interact with others • use general or technical language in an appropriate manner • express ideas fluently

CONTENTS

[SCL Introduction](#)
[What is SCL?](#)
[Why SCL?](#)
[Know your students](#)
[Learning outcomes](#)
[Strategies](#)
[Assessment](#)
[Evaluation](#)
[Resources](#)
[References](#)

Form of assessment	Example of objectives
Simulated tasks	<ul style="list-style-type: none"> • show appropriate attitudes • interact with others—apply knowledge or experience • analyse and synthesise ideas • display creativity or imagination
Group project	<ul style="list-style-type: none"> • cooperate • benefit from 'real life' situations • evaluate personal skills • integrate with other views or models

Tip!

In setting questions, focus on the why and how rather than simply factual information.

CONTENTS

[SCL Introduction](#)

[What is SCL?](#)

[Why SCL?](#)

[Know your students](#)

[Learning outcomes](#)

[Strategies](#)

[Assessment](#)

[Evaluation](#)

[Resources](#)

[References](#)

Evaluation

Evaluation enables you to see how effective your course has been and how effective you have been in presenting the course. 'Effectiveness' means how well the goals you envisaged for the course were met.

One of the lessons learned about evaluation is not to try to evaluate too much at one time. Setting about evaluating every aspect of a course is very daunting, and you may be discouraged from making changes altogether. It is better to evaluate a few carefully selected and manageable aspects of the course.

Types of evaluation

Curriculum evaluation falls into two broad categories ([Henry, Hughes & Feletti¹⁵](#))

- **outcome evaluation** looks at the qualities your course engenders in students.
- **process evaluation** considers what happens during the learning/teaching process and examines the course in its operation.

Tip!

Baseline measures are needed for outcome evaluation. For example, to find out if your graduates have better problem-solving skills in their post-university lives, you will need to know the current problem-solving skill levels of graduates.

CONTENTS

[SCL Introduction](#)

[What is SCL?](#)

[Why SCL?](#)

[Know your students](#)

[Learning outcomes](#)

[Strategies](#)

[Assessment](#)

[Evaluation](#)

[Resources](#)

[References](#)

Steps in evaluation

Step 1: Select what it is you want to evaluate

For **process evaluation** items this depends on what you were aiming to do and might involve questions such as:

- did I give my students the incentive (through assessment and structure) to develop their own independent learning?
- did the activities I offered really get the students involved?
- could the students generalise their subject knowledge to aspects of the non-academic world?
- was I an effective communicator?

For **outcome evaluation** the items selected will be suggested by the goals you set for the course. You might want to know:

- did my students acquire the knowledge goals I set for them?
- are they better critical thinkers than when they began?
- are they better at problem setting and solving than my previous students taught by lecture and tutorial?

CONTENTS

[SCL Introduction](#)

[What is SCL?](#)

[Why SCL?](#)

[Know your students](#)

[Learning outcomes](#)

[Strategies](#)

[Assessment](#)

[Evaluation](#)

[Resources](#)

[References](#)

Step 2: Select the most appropriate strategy for the evaluation

While questionnaires and inventories can be helpful, sometimes a simple question to students can achieve the same ends.

Sources of Information for an Evaluation (Newble & Cannon 1995¹⁶)

Sources	For information on...
Students	Implementation, teaching quality
Graduates	Relevance of course to work
Observers	Descriptions of class process
Professional associations	Comparative data against agreed standard
Employers	Satisfaction with graduate skills
Course materials	Teaching plans, philosophies
Assessment results	Learning outcomes

CONTENTS

[SCL Introduction](#)

[What is SCL?](#)

[Why SCL?](#)

[Know your students](#)

[Learning outcomes](#)

[Strategies](#)

[Assessment](#)

[Evaluation](#)

[Resources](#)

[References](#)

Different methods are available to gather information from these sources. Some of these methods are listed below.

Methods and Techniques for an Evaluation (Newble & Cannon 1995¹⁶)

Method	Evaluates
Questionnaires	Student, graduate, employer opinion
Interviews	Teaching and/or curriculum
Students' diaries/work records/logs	Learning activities, processes and reactions
Discussion (focus group, panel)	Teaching and/or curriculum
Comments (both solicited and unsolicited)	Teaching and/or curriculum
Observation of student/teacher behaviour	Learning processes, teaching behaviour
'Unobtrusive' observation (eg noting the extent of use of library books)	Student's learning activities
Feedback sections on web pages	Almost all areas of teaching and other facilities
Results of student work	Student learning

(See an example of one lecturer's attempts to gather ongoing [feedback via email](#), and an [evaluation of tutorials using video](#))

CONTENTS

[SCL Introduction](#)

[What is SCL?](#)

[Why SCL?](#)

[Know your students](#)

[Learning outcomes](#)

[Strategies](#)

[Assessment](#)

[Evaluation](#)

[Resources](#)

[References](#)

Step 3: Analyse the results

Evaluation results should be explored for issues beyond those immediately apparent. Probing under the surface can often identify useful additional information.

Are female and male students responding differently?

What about international students, are there specific issues being identified by them?

Are the results different from what you intuitively expected?

Might the way the question was asked have been ambiguous?

Often talking over the results with someone not actively involved in the activity can put a different perspective on the results.

Step 4: Provide feedback and propose action

The results of the evaluation need to be collated and fed back to the students, along with information on how you or the department will respond. This indicates that you are serious about continual improvement and reinforces the students' belief that their sincere application to the evaluation process has been worthwhile.

CONTENTS

[SCL Introduction](#)
[What is SCL?](#)
[Why SCL?](#)
[Know your students](#)
[Learning outcomes](#)
[Strategies](#)
[Assessment](#)
[Evaluation](#)
[Resources](#)
[References](#)

Resources

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Roseworthy Library. Call No. 378.013 1

[Deliberations](#) on Teaching and Learning in Higher Education

Under 'Generic Learning & Teaching Resources and Issues' there are two especially informative sections, one on collaborative learning and the other on assessment.

Gibbs, G. (1994). *Learning in teams*. Oxford Centre for Staff Development

available CLPD: clpd@adelaide.edu.au

Gibbs, G. (1992). *Discussion with more students. The Teaching Students More Project*. UK, PCFC, Oxonian Rewley Press.

One of a series of five booklets, available in the CLPD, for teachers of large classes. Practical strategies for fostering discussion.

available CLPD: clpd@adelaide.edu.au

Gibbs, G., Habeshaw, S. and Habeshaw, T. (1984). *53 Interesting things to do in your lectures*. Bristol, Technical and Educational Services.

Barr Smith Library. Call No. 378.1796 G442f

Habeshaw, S., Gibbs, G. and Habeshaw, T. (1992). *53 Interesting things to do in your seminars and tutorials*. Bristol, Technical and Educational Services.

This book suggests ways to present your material be it in a small or large teaching situation, how to use handouts, diagrams, and articles effectively, linking lectures and tutorials from week to week, holding students' attention, facilitating active learning and evaluating and 'checking' student learning.

Barr Smith Library. Call No. 378.177 H115f

CONTENTS

SCL Introduction

What is SCL?

Why SCL?

Know your students

Learning outcomes

Strategies

Assessment

Evaluation

Resources

References

Ingleton, C. and Wake, B. (1997). *Literacy matters*. The University of Adelaide.
Has examples of assessment criteria used for marking in several disciplines to move from facts only to more critical thinking, or from rote learning to understanding.

available CLPD: clpd@adelaide.edu.au

Kelvin, A. (1993). Increasing student participation in the learning process.
Higher Education, 26.

The paper addresses the need to increase student participation in the teaching and learning process. Author uses an engineering case study.

Barr Smith Library. Call No. 378.05 H629

[The Centre for Learning and Teaching Support \(Monash Uni.\)](#)

Has several items relevant to teamwork: Personality Types, Learning Preferences, Problem-solving and communication skills in Engineering. Also includes What is PBL? Six Thinking Hats, Mind maps and concept maps, Researching in the Library, Computing skills, Writing reports, Self Management, Logbooks, Presentations.

Nightingale et al. (1996). *Assessing learning in universities*. PDC, University of NSW.

A collection of best assessment practices from universities around Australia. One of the best handbooks on assessment

available CLPD: clpd@adelaide.edu.au

Ruddock, J. (1978). *Learning through small group discussion*. SRHE Monograph, University of Surrey.

Whilst the text may be dated (1978) Ruddock's book is still very relevant. It provides an overview of the main points to consider when teaching small groups. These include problems of participation, the tutor's role and responsibilities, practical matters such as group size, formation and stability, and eliciting feedback from the group.

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CONTENTS

[SCL Introduction](#)

[What is SCL?](#)

[Why SCL?](#)

[Know your students](#)

[Learning outcomes](#)

[Strategies](#)

[Assessment](#)

[Evaluation](#)

[Resources](#)

[References](#)

Tyson, T. (1989). *Working with Groups*. School of Environmental Planning, University of Melbourne.

Covers group development, organisation, communication, leadership, and group effectiveness. Chapter six focuses on developing a supportive working atmosphere, ensuring group goals are co-operatively rather than competitively structured, commitment to task, competent leadership, interpersonal communication, conflict management, decision making and evaluation.

Barr Smith Library. Call No. 302.34 T994w.

[Ultibase resource reviews](#)

Reviews of video resources, one on groupwork by Murdoch University and two others on student-centred learning in general, one from the University of Technology, Sydney, the other from the University of Queensland.

Woods, D.R. (1990). Developing Students' Problem Solving Skills. *Journal of College Science Teachers*, January.

Woods discusses the ideas contained in four papers focusing on problem solving in the context of chemistry.

Barr Smith Library. Call No. 378.7305 J86.

Woods, D. R. (1990). More thoughts on problem solving in the context of chemistry. *Journal of College Science Teaching*, November.

Woods addresses the issue of developing students' problem solving skills when lack of time and resources, class size and institutional rigidity all conspire to prevent even the 'best' educators from involving students in mentally challenging activities.

Barr Smith Library. Call No. 378.7305 J86.

CONTENTS

[SCL Introduction](#)
[What is SCL?](#)
[Why SCL?](#)
[Know your students](#)
[Learning outcomes](#)
[Strategies](#)
[Assessment](#)
[Evaluation](#)
[Resources](#)
[References](#)

References

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CONTENTS

[SCL Introduction](#)

[What is SCL?](#)

[Why SCL?](#)

[Know your students](#)

[Learning outcomes](#)

[Strategies](#)

[Assessment](#)

[Evaluation](#)

[Resources](#)

[References](#)

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CONTENTS

SCL Introduction
What is SCL?
Why SCL?
Know your students
Learning outcomes
Strategies
Assessment
Evaluation
Resources
References

You have reached the end
of this document

Leap into...

Student-centred Learning

This publication was originally researched and written by
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