# Experiences from adopting a situational learning course structure *

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***SUMMARY:*** *The School of Mechanical Engineering at the University of Adelaide aims to ensure that its students not only achieve technical competence but also develop the interpersonal skills sought by industry. Situational learning (Davenport & Baron, 2007) is a new approach where students are placed in a situation comparable to that expected in industry, but with the support to develop the skills intended of the course. This paper presents the experiences of moving the Structural Analysis and Design course from interactive learning (Bammann et al, 2005) to a full situational learning approach. Feedback from a student survey is presented together with an assessment by the authors, who are the course supervisors and the course lecturer. Implementing situational learning was found to have a mixed outcome; while retaining the benefits of interactive learning, a range of issues were found still needing to be addressed.*

## 1 INTRODUCTION

Professional engineers, in addition to their technical competence, have always required a wide range of interpersonal skills to be successful in their work. This is more prevalent today where further challenges in environmental, climatic and long-term resource issues need to be carefully addressed. Perhaps the biggest challenge is that faced early in professional life to meet the demands of an ever more competitive and social society. It is here that universities (Mills & Treagust, 2003; Demel et al, 2005; Bammann et al, 2005), and in this case the School of Mechanical Engineering at the University of Adelaide, are responding by developing these skills at an undergraduate level.

Situational learning is a learning methodology in which students not only gain technical competence but also the attributes desired by graduate employers. In situational learning practices, students are placed in realistic scenarios to solve the types of problems encountered in the workforce. Importantly, they learn to recognise the techniques required to provide a solution, and then to study, learn and apply the technical skills required. This learning methodology encourages students to consider a wide range of factors when solving problems, to make realistic decisions and then to reflect on the project outcomes. It differs from project-based learning, though, in that it is aimed at learning technical skills as in lectured courses, rather than applying previously learnt skills to develop the outcomes and documentation required for a specific engineering project.

The success of implementing a situational learning approach in the Structural Analysis and Design course is discussed in this paper. Student feedback responding to the implementation of a situational learning approach is examined and questions arising from this are highlighted together with a means of addressing them.

## 2 BACKGROUND OF THE STRUCTURAL ANALYSIS AND DESIGN COURSE

Structural Analysis and Design is a level III subject that introduces basic structural aspects of civil engineering to mechanical engineering students. The intention of this course is to provide mechanical engineering students with an understanding of other branches of engineering that they may encounter during their career.

In 1995, when Author 5 commenced teaching the subject, the teaching method was "chalk and talk", supported by transparency overheads with a focus on how to understand and do the sums for structural steel and reinforced concrete members.

By the turn of the millennia, when student numbers had increased to 85 and at one stage 150, it was

* Paper D08-041 submitted 13/08/08; accepted for publication after review and revision 22/12/08.

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recognised that interpersonal skills needed to be incorporated in the Structural Analysis and Design course, and that the course needed to be made more applicable to mechanical engineering students. Recognising the range of work mechanical engineers have been involved with, five major topics – the design and analysis of timber, steel, aluminium, road pavements and reinforced concrete structures – were included, but with an orientation towards projects mechanical engineers were commonly involved in such as the construction of pipe and tank systems, and in the case of aluminium, a yacht mast.

While such a range of topics seem impossible for a single course, it was presented on the basis of gaining a familiarity, but with sufficient understanding, such as would be appropriate to an industrial situation. To do this, a "design manual" was produced, which was based on the idea of the dot-point notes a working engineer might jot down. Of course dot-point explanations were incorporated, but the biggest challenge was to reduce the incredible amount of technical documents and standards into a practical workable size for the students. Importantly, the design manual, in being a technical reference document, not a set of course notes, was set out to encourage students to use their own initiative and to encourage discussion with others, perhaps adding their own comments to aid understanding. Thus it becomes an expedient aid for a professional engineer, while involving those in-depth abilities so essential to the profession and not just a "step-by-step" instruction that could be followed in isolation to get the right answer for a tutorial.

Furthering this approach and the development of interpersonal skills, quality assurance procedures were introduced enabling students to achieve "fit for purpose" outcomes of their tutorial projects. In recognition of this, marks are allocated in accordance with the quality that would be accepted in industry, so resulting in submissions of the appropriate standard – no "half measures".

Marking and the final examination remained as described by Bammann et al (2005), but with the term work increased to 60% and the final Respondus (Blackboard Inc., n. d.) examination 40%.

## 3 LEARNING AND TEACHING

In 2008, the course objectives were as follows:

1. To give students a broad understanding of structural systems relating to the work mechanical engineers may undertake in their careers.
2. To teach expedient methods of analysis and design that can be used in practice.
3. To cultivate the skills required in workplace practice – teamwork, effective communication, supportive management, assurance of quality, etc.
4. To teach the skills to produce a "fit for purpose" solution with guidance sought only when required.
5. To bring an awareness of the practices that lead to successful careers.

Of course, objectives 3 to 5 could well be applied to all subjects at the university. In the past it was more common for these to be left to be learnt in the workplace, but it has been found that including them during undergraduate study provides a significant benefit to learning, as well as sound preparation for industry.

To ensure that objectives 3 to 5 were met, a situational learning approach was adopted in the Structural Analysis and Design course in 2008. This coincided with the University of Adelaide Staff Educational Unit presenting the "Online Situational Learning Project" (Davenport & Baron, 2007) in the same year.

In implementing situational learning, students were placed in teams each with a team leader and quality assurance manager. For tutorial exercises, team leaders were briefed by the lecturer and then had the responsibility of briefing their teams. Importantly, when uncertainty was found, this had to be discussed between members of the team before outside help was sought. To implement this learning method with such a large class size, a number of course instructors, who were postgraduate students, provided assistance. Each course instructor was responsible for three to four teams, and while they would provide guidance on how to look up information, they endeavoured to refrain from providing specific instruction. This encouraged team members to discuss and research the problem themselves. In addition, the course instructors operated as a client requiring work to be presented to them in a quality assured manner together with a relevant audit trail.

The tutorials, which formed the basis of the technical skills to be learnt, were of a similar form to what would be provided for a typical lectured class. For example, to start with there were a set of straight forward questions such as for the calculation of the size of a weld to carry a specified load. The final part of two tutorials included a "mini project", one being the examination of the project documentation of the construction of a major building and the provision of comments on various parts. Additionally, there was a special topic forum where students were asked to discuss in their teams their thoughts on their future career and to consider aspects that would impact on the success of their careers.

In the past, a 2-hour lecture session and a 1-hour tutorial session were held each week. In 2007, the students were provided with the lectures on a CD-ROM, which resulted in the majority of students deciding not to attend lectures. A survey at the end of the course revealed that all but three students felt that with provision of the CD there was no need to attend lectures.

In 2008, students were provided with a CD-ROM of the lectures that also included a lot of relevant technical links and documentation. In addition, each student was given a "design manual". To provide an appropriate introduction and familiarisation, the lecturer and course instructors presented three introductory lectures on the first day of the course.

After the introductory lectures, two 50-minute tutorial sessions were run each week with no further lectures being given. In the front of their design manual, the students were provided with a "Situational learning plan and targets", which provided a study and tutorial schedule. Importantly, considering their professional responsibility, they were expected to bind their design manual with a plastic binder to make it more accessible, as well as to develop an index of contents so as to assist in becoming familiar with the document – being a quality assurance issue, 3% of their marks were allocated for this.

For each tutorial question, a new team leader and quality assurance manager was elected, ensuring that each student had a turn in each role. To commence a new tutorial exercise, a special "client" meeting was held where the team leaders met with the lecturer who presented the tutorial requirements and provided team leaders with some guidance on how to approach the tutorial questions. It was then each team leader's responsibility to communicate this information to their team members and ensure that the tutorial project was completed by a target date.

As in industry, student team leaders were able to seek help and advice from the more experienced lecturer. Limiting this to the team leaders encouraged communication within the team, as well as enabled a more intimate discussion with the lecturer on the issues of concern.

The final marks achieved in the course were high with the lowest being a credit. This is partly attributable to the quality assurance processes ensuring a high standard of the term work, but also indicates that situation learning provides a successful method of learning.

## 4 FORM OF LECTURES

The old method of "chalk and talk" provided many advantages, including giving the lecturer the ability to interact with the class and discuss issues using the blackboard (or whiteboard). On the negative side, keeping up with the discussions, especially in larger classes, was often difficult for the students and there was little opportunity for the students to interact individually with the lecturer.

Then with the development of computers came further opportunities. The development of PowerPoint in 1984 and the later acquisition by Microsoft saw a great opportunity for further improvement in presentation of lectures. PowerPoint became very effective in presenting dot-points – maybe 10 to 20 words, and/or appropriate clip art, graphs and pictures. While ideal in many instances, for more complex presentations where the flexibility of drawing onto a blackboard or a projected transparent overhead was beneficial, there was the limitation of dealing with a fixed slide.

This was clearly a challenge for Structural Analysis and Design. On consideration it was decided to use QikLink (QikDraw Systems, n. d.), a local computer aided drafting (CAD) package. This provided a facility like PowerPoint, but with very effective – even animated 3D – diagrams, as well as the flexibility to zoom in and focus on a particular item. Also, the screen could be drawn or written on during the presentation.

Taking some initiative, the Structural Analysis and Design lectures were prepared using QikLink. While there was certainly a degree of success, there was still the tediousness of many slides presented in a darkened theatre. The next step was to produce the lectures on a compact disc.

QikLink had been developed for installation on a CD or DVD to enable the secure documentation of major engineering projects. With this facility, a lecture CD could be produced that would run on a PC computer without the need for installation of any program, thus simplifying distribution to users.

In producing the lecture CD, technical and product literature with applicable weblinks were included and analysis programs were installed for ready access. Also, a required reference for one of the tutorials, the documentation of the construction of the Engineering and Mathematical Sciences building, which had been undertaken a few years previously, was included.

To enable ready access during the final examination, which is undertaken by computer using MyUni Respondus (The University of Adelaide, n. d. 1; Blackboard Inc., n. d.) – a multiple choice answer examination – the "lecture CD" is also installed on the university computers.

## 5 STUDENT SURVEY

To assess the reaction to the new "situational learning" method, a survey was given to the Structural Analysis and Design students. The survey responses are stated in the Appendix and the survey comments are discussed here. The number of students who responded to the survey is shown in the bar charts provided in the Appendix; for example, 53 students from a class of 85 responded to question 1 or 62% of the class. This was assessed to provide a representative response from the class.

It is clear from the wide range of responses, that the students have their own individual learning

preferences. A number of trends can be seen in the survey comments, some negative and some positive, which are summarised as follows:

- There was a general consensus that the course with its wide range of topics was of value, with only six students indicating they felt it was of little value.
- There were a broad range of responses to the situational learning method, but in general the students expressed a need for at least introductory lectures to each of the major topics and more technical guidance. The general opinion was that the lectures should not simply repeat the design manual contents, but provide detailed explanations of particular aspects.
  - o An important aspect of situational learning is that it requires students to ask questions when they do not understand an aspect of a tutorial. Course instructors were available for this and for the more technical questions team leaders could approach the lecturer. This was limited to team leaders because of the class size and to encourage the team leader to work interactively with other students by relaying this information back to the members in their teams.
  - o Although some student responses to situational learning were positive, many were quite critical of insufficient guidance and instruction. One student noted in response to question 9 of the survey "Team leaders are a good idea. Briefings were mostly useless" (he only attended one team leader meeting but provided an issue that needed evaluation and addressing).
  - o In general, the team leaders did not ask questions during the team leader meetings, even when encouraged. This is an issue that needs further attention. The students could perhaps benefit from further training or encouragement to be confident enough to engage in a "mature" way with the "client" (ie. the lecturer) and the course instructors. Should this "maturity" be seen as a part of being a university student and a step away from being a school student?
  - o There was mixed opinion on the general strategy of the course, which involved working in teams with a team leader and quality assurance manager. It appeared as though some students were just not confident in the role of team manager and felt this compromised the technical learning of the team. In regards to adopting a quality assurance plan, many students felt they had no need for this in order to complete their assignments and that it was just a paperwork burden. Despite these reservations, the overall student response to the general course strategy was positive.
  - o The reported concern with the responsibility of the team leaders passing "client" and technical information back to their team members is important and needs careful consideration.
  - o Teams seemed to not want their course instructors sitting in on their meetings, but from the survey responses it appears that this must be made obligatory. The course instructor is not present at the meetings to take the role of team leader, but just to ensure that the meeting proceeds with purpose and to provide some guidance and encouragement. To ensure this occurs, marks will need to be allocated to students attending meetings involving the course instructor.
- Many students indicated difficulty in understanding the design manual and particularly the information on the CD. This had only occurred in a limited way in previous years possibly due to the explanations being provided in lectures. No student indicated that they used the explanations provided in the CD or recognised the additional features such as links to websites, product information, analysis programs, etc. The design manual presents analysis and design information in a concise manner, but many students indicated they needed a detailed step-by-step process to follow.
  - o It is made clear to the students both in the introductory lecture and right on the first page that the design manual is <u>not</u> academic course notes, but compact technical notes presented for quick scanning. How to use the design manual is briefly explained and the importance of binding the design manual with a contents page is also noted.
  - o If the design manual was prepared as the students wished in their responses to the survey, it would become overwhelming in size and impractical for its purpose.
  - o With this course being "situational learning" it is not intended that students simply follow step-by-step course instructions when completing their assignments. An important part of the course is to learn how to use the design manual effectively, and this requires that students liaise with the lecturer and course instructors and be responsible for ensuring their own design aids are properly maintained. A solution to this is to provide an introductory lecture to each topic and to reinforce how to use the design manual.
- A number of students expressed concern over the work load, especially with the preparation of reports quoting five assignments to be completed each week.
  - o This workload is produced by all the courses taken over the semester, however, Structural Analysis and Design is limited to five assignments with appropriate timing for each.
- Some students indicated the tutorials took a significant time to complete, even though it was

a team exercise with questions distributed to each member. Some students indicated a need to complete the entire tutorial themselves, which took too much time. This possibly indicated inappropriate team work.

  - o The tutorial questions are designed to be answered reasonably quickly using the expedient methods from the design manual (eg. by just referencing the figures in a table). This requires that the students know how to use the design manual.
  - o Two tutorials had mini projects, but students were given approximately 4 weeks to complete these, which was ample time.
  - o This issue appears to arise due to the time taken to understand the principles and techniques that should have been addressed by discussion with the team, and then course instructors and the lecturer. Reinforcement of the basic principles in the proposed introductory lectures for each topic would address this.

- Limited access to teaching staff was indicated as a difficulty.
  - o This may have been due to the lecturer being a visiting adjunct staff member.
  - o Making it compulsory (with marks attached) for teams to invite a course instructor to attend selected meetings should resolve this – it seems teams refrained from doing this and endeavoured to obtain access to teaching staff outside of class time.
- Many students indicated they did not follow the course program or even know of it. This guide provided a schedule for the course, as well as giving the targets for the tutorials, and was placed in the very front of the design manual for ready reference.
  - o This is entirely a student responsibility as the course program was right at the front of the design manual providing a structure for tutorials and for following the lectures on the CD. It does raise the question of why this occurred and whether a more prescriptive approach is required in addressing student responsibility.
- Most students indicated they did not prepare a contents page as was required for overall familiarisation of the subject – some students indicated that the contents page should have been provided, some indicated it was not needed and some indicated an issue with page numbers making it too difficult.
  - o This was a student responsibility aimed at meeting the goals of the course, ie. to simply be aware of what is in the design manual as not all of the material is covered in the tutorials.
  - o Following a review between the course instructors and lecturer, it is considered that provision of introductory lectures will meet the aim of preparing a contents page so the requirement to do this will be removed. A general contents page will be added to the design manual, but students will still be encouraged to add tags to selected pages to aid quick reference.
- General observation showed many students did not bind their design manuals as required to make them easier to access the pages – some indicating this should have been done for them. At the end of the course, many design manuals looked dilapidated. Some reported their CDs were damaged – possibly because the CD pockets in their design manuals were destroyed.
  - o This is surprising and unprofessional with no excuse. As a future professional it is their responsibility to properly look after their professional aids and equipment.
  - o It is noted that not enough marks were allocated for this. Making this an essential part of Tutorial 1 will fix this.
- At the very end of the course many students did complete the contents page and properly bound their design manual to gain the marks, but this basically defeated the intention of doing it.

## 6 ASSESSMENT OF STUDENT FEEDBACK

It was clear from their feedback that the students recognised the value of the course and the range of materials studied. This is different to past years when the course was limited to the procedures for analysis and design of steel and concrete structural members.

It is clear that the students did not learn how to adequately use their design manual. To overcome this it is necessary to provide appropriate lectures to the whole class. Providing selected lectures would not compromise the concept of situational learning, the main aim of which is to facilitate students working together representing an industrial context. To do this the subject needs to be allocated additional lecture time with 5 hours to cover the course introduction, each major topic and the tutorial introductions considered sufficient (this year the course had been cut back from 3 to 2 hours a week). Also, it is necessary to have a lecture theatre allocated for this as the tutorial room that had been assigned to this course is unsuitable.

The student's ability to work in teams seemed to be low. This was especially evident for the role of the team leader who had the responsibility of obtaining the "client's" requirements for the tutorial exercise, and properly informing and working with their team. In the meeting with the lecturer (as client), team leaders were very reluctant to ask questions, preferring to do this after the meeting.

Of particular concern is the lack of care of their design manuals and the expectation that someone else should have bound them. It is expected as an important part of quality assurance that the students would recognise that their design aids need appropriate care and that they themselves should feel responsible to ensure this happens. Such expectation appears to require more emphasis in the introduction to the course.

In terms of quality assurance, it appears necessary for our course instructors to be seen in a more authoritative role, ie. like the client who they need to keep informed of progress and maintenance of quality. Probably this should involve the lecturer being seen to require this.

Of serious concern is that it became evident from questions to the lecturer that many students could not relate the tutorial questions to physical structures. The course Structural Analysis and Design is based on this skill having been developed in previous studies, but it is clear further guidance is required.

## 7 DEVELOPMENT OF TEAM SKILLS

It was found that a number of students had difficulty understanding the course concepts following the implementation of situational learning. This appears to result from a lack of confidence in the situational learning process, which differs markedly from earlier year engineering courses where students calculate an exact answer for an assignment following a given set of solution steps. The result is that the students want to check their answers with their course instructor. As we know, in industry there is no absolute answer to confirm the analysis. The only way is to check the calculation using a so called "forward or backward" approach. To a certain extent, situational learning aims to build up the student's confidence levels to the point where they are able to convince themselves of their capability. Besides that, in practical engineering work, an engineer must be able to work independently with minimum supervision and have the ability to teach themselves. This could be a reason for the low score for question 3 in the student survey: "What degree of support do you feel was necessary to understand the course?"

While these concerns were present, the survey responses were more positive than negative, indicating that the situational learning approach does build up students' leadership and self-capability. This became more apparent toward the end of the course.

Initially most team members were nervous and quiet, but team performance improved as the course proceeded. It appeared that most students had experienced the general stages of team development such as forming, storming, norming, performing and adjourning stages, resulting in the improvement of teamwork. Such developmental experiences are intended components of situational learning.

Adoption of a quality assurance approach showed a significant improvement in preparation of tutorial solutions. A consideration is whether to introduce the ISO 9001:2000 quality management system at the beginning of the course and whether this would improve student performance. Further benchmarking could be done by comparing the quality of work produced by students.

A further consideration is whether self- and peer-assessment can be an effective means of encouraging, developing and assessing group work "processes", so as to complement the assessment of the actual technical "product" of the assignment.

## 8 CONCLUSIONS

While there has been a significant learning transition in the initial adoption of full situational learning, it is assessed as a valuable way of teaching Structural Analysis and Design. The main area of concern is to ensure and provide opportunity for all students to develop professional confidence and responsibility.

In the development of generic and interpersonal skills, the continuation of interactive learning with the implementation of teams, team leaders and quality assurance managers remains applicable.

On the teaching side, it is clear that brief introductory lectures on each topic clarifying the use of the design manual and noting critical issues would enable students to move forward with more confidence. Such lectures would be presented in the form of an industrial setting, making it compatible with situational learning. Guidance on this would also be emphasised in discussions between students and the lecturer or course instructors.

To aid the development of confidence in the responsibilities of team leaders and quality assurance managers (positions that are undertaken in turn by each team member), a system to mandate teams to request attendance of a course instructor at specified team meetings should be implemented. Additionally, the need to provide a specialised short course in applicable team skills requires assessment.

In order to encourage a professional approach by students in looking after their design aids, the allocation of marks requires modification to provide greater emphasis to this.

Of concern to students was that the marks for this subject were shared with another subject, Solid Mechanics, making them less enthusiastic to put appropriate effort into their study. Their preference is for Structural Analysis and Design to stand on its own in marking.

Most students recognised Structural Analysis and Design with its wide range of topics as providing value for their future careers.

## REFERENCES

Bammann, T. C., Jones, R., Pearce, S., Wood, R. & Doherty L. 2005, "Interactive Learning – Is it working?", *Proceedings of the 2005 ASEE/AaeE 4th Global Colloquium on Engineering Education*, 2005, Paper 196, www.aaee.com.au/conferences/papers/2005/Paper/Paper_196.pdf.

Blackboard Inc, (n. d.), http://access.blackboard.com and www.blackboard.com/extend.

Davenport, A. & Baron, J. 2007, "Meeting the 21st Century Challenge: The Situational Learning Initiative at the University of Adelaide", in *ICT: Providing choices for learners and learning. Proceedings ascilite Singapore 2007*, www.ascilite.org.au/conferences/singapore07/procs/davenport.pdf.

Demel, J. T., Freuler, R. J. & Harper, K. A. 2005, "Helping Students Recognize and Solve Different Problem Types in Engineering, Mathematics, and Physics", *Proceedings of the 2005 American Society for Engineering Education Annual Conference & Exposition*, American Society for Engineering Education, http://soa.asee.org/paper/conference/paper-view.cfm?id=21304.

Gunn, C. J. 2004, "Making Sense of Those Early Required Courses", *Proceedings of the 2004 American Society for Engineering Education Annual Conference & Exposition*, American Society for Engineering Education, http://soa.asee.org/paper/conference/paper-view.cfm?id=19352.

Mills, J. E. & Treagust, D. F. 2003, "Engineering Education – Is Problem-Based or Project-Based Learning the Answer?", *Australasian J. of Engng. Educ.*, online publication, 2003-04, www.aaee.com.au/journal/2003/mills_treagust03.pdf.

QikDraw Systems, (n. d.), www.qikdraw.com.

The University of Adelaide, (n. d. 1), MyUni at The University of Adelaide, http://myuni.adelaide.edu.au, (password required).

The University of Adelaide, (n. d. 2), Situational Learning, www.adelaide.edu.au/situationallearning.

## APPENDIX: COURSE SURVEY

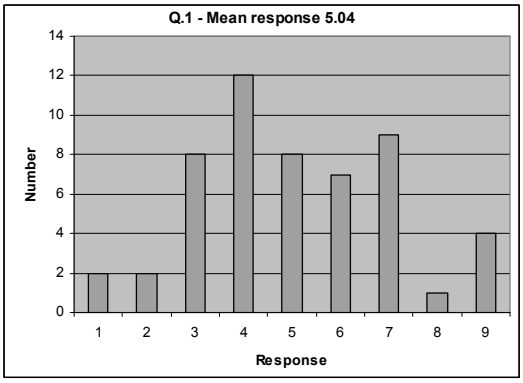
Please complete this course survey as accurately as you can. Its purpose is to further develop the education and training aimed at providing a sound professional engineering capability. How you have chosen to study this subject is entirely in your hands so please don't feel that you need to provide the "right" answers. Provide a tick in the boxes 1 to 9 where you feel you are between the explanations at each side. Please add a brief comment as you wish. Any more detailed comments provided on a separate sheet will be appreciated.

1. It was only last Tuesday when my 22 month old granddaughter was watching me adjust the mechanism in a toy she had been playing with (it had been her mother's). She watched me starting to replace the back panel then picked up the screws and endeavoured to put them in the holes. Yes, with a little bit of guidance to put the pointy end in first. Then she picked up the Phillips head screwdriver and again needed a bit of guidance as first she tried turning it anticlockwise – but then she succeeded.

   This is one of the main aims of the course – to recognise the issue, to identify what needs to be done, to assess and collect the techniques to provide a solution to the issue and, yes, then to seek some guidance for aspects you feel needs clarification.

   Which course of action do you feel is most appropriate for your future as a professional engineer?

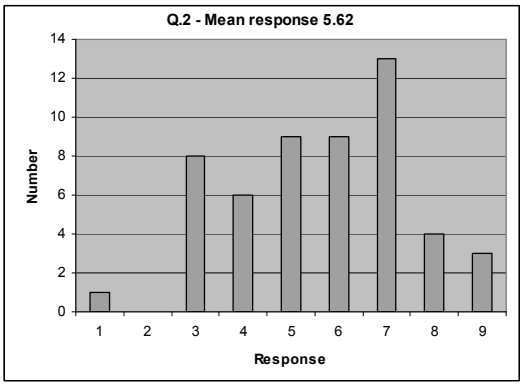
You prefer step by step instruction so you can follow a defined course to solve an issue




You prefer development of self capability in assessing and solving an issue

2. Do you believe the course strategy helped develop your self capability?

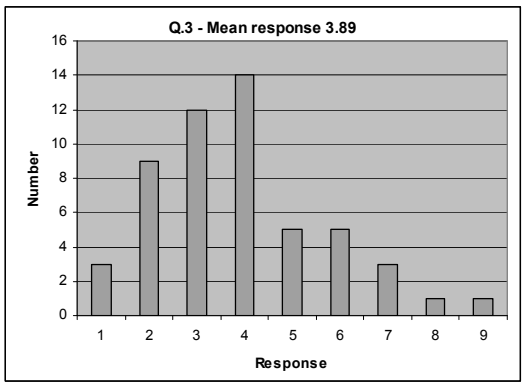
No




Yes

3. What degree of support do you feel was necessary to understand the course?

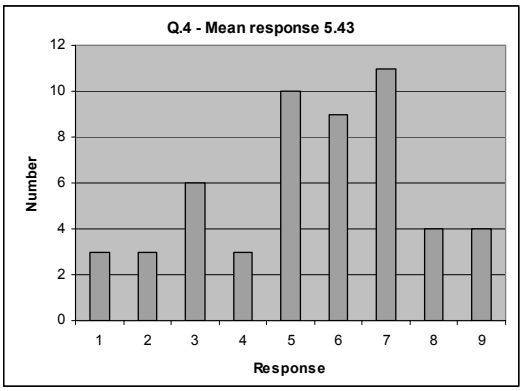
I found it difficult to understand the design manual notes and needed further guidance




I was able to adequately follow the course with the facilities provided

4. Did you read through and follow the lectures, guidance and examples on the CD?

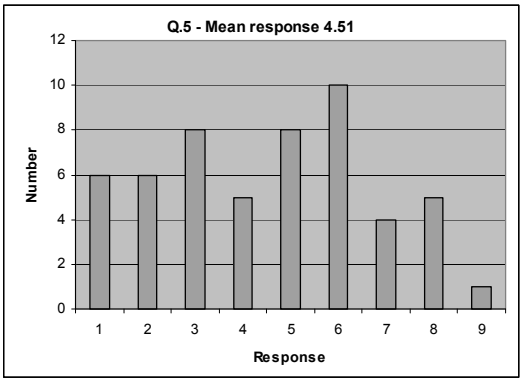
No




Yes

5. Did you follow the course program in the front of the design manual when studying the various topics?

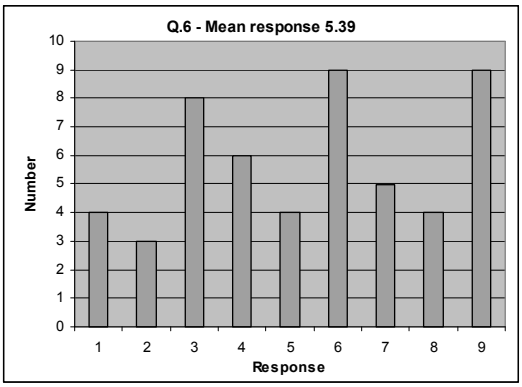
No




Yes

6. In regard to the index of contents for the design manual?

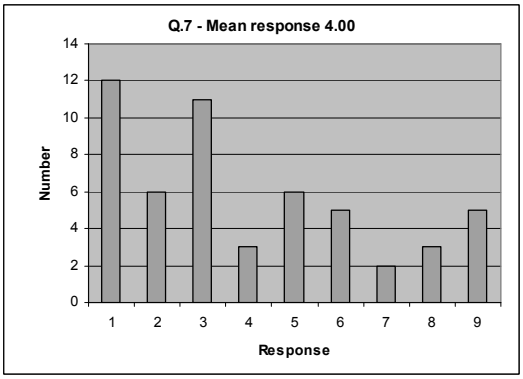
I found no need for this




I found it necessary in order to quickly find information in the design manual

7. Should an index of contents for the design manual be provided?

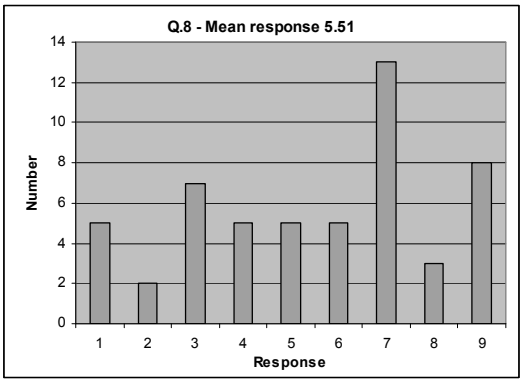
Yes it is a waste of time preparing this myself




Preparing this is a help in studying the course and enables me to make it to best suit me

8. Did you see the benefit of using quality assurance in preparation of the tutorial solutions?

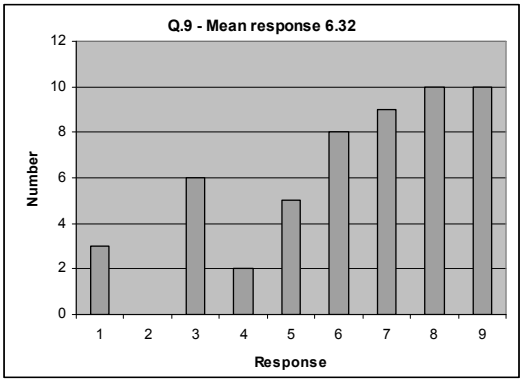
No




Yes, it gave an insight into providing reliability in a professional or industrial setting

9. Did you feel the role of team leader aided the development of responsibility toward your team?

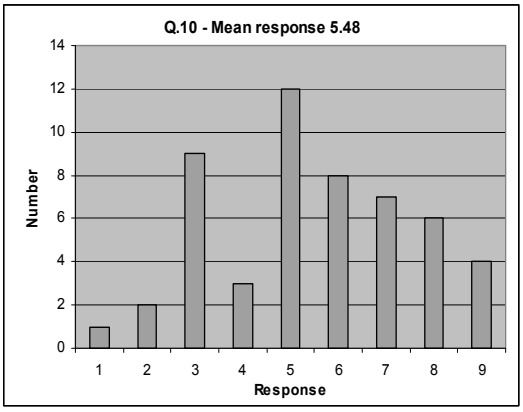
No, it created confusion and would have been better to provide instruction to all in the team




Yes, it helped understanding the responsibility needed for success in professional life

10. This course was undertaken on the principle of "situational learning" where lectures are not formally presented but you are put in a "real work" situation. Was this a more effective way of developing professional skills?

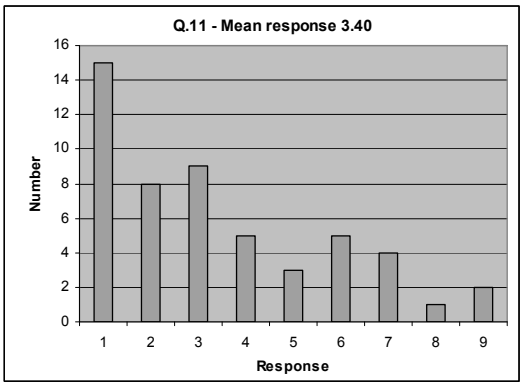
No, we are still at the learning stage where we need in depth guidance




Yes, because we had to learn the responsibility of "standing on our own" to develop sound solutions

11. Would the provision of introductory lectures to each topic be preferred?

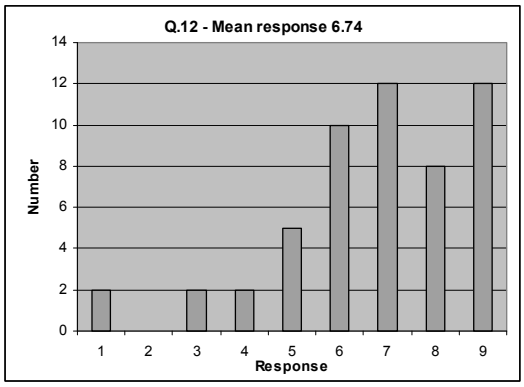
Yes, it would provide initial guidance and help me to read the full lectures on the CD




No, I am quite capable of reading the lectures on the CD provided I can seek explanation as needed

12. This course contains an incredible range of topics each of which could be a course in itself. Being more of a general engineering knowledge, though, they are taught not in depth but in a practical user manner. Graduates have reported from industry that they found this to be of significant value. How do you feel about this at the moment?

I don't see it to be of any value to my future so I just do as little as I need to get a pass




I see the value both in the broader engineering knowledge and the gaining of practical work skills

**ERWIN GAMBOA**

Dr Erwin Gamboa has been at The University of Adelaide since 2003. He was a postdoc at the university for four years, after which he became a lecturer in the areas of corrosion, fracture mechanics and stress analysis. Currently his research involves aspects of gas pipelines (metallurgy, welding, corrosion).

**DANIELLE MOREAU**

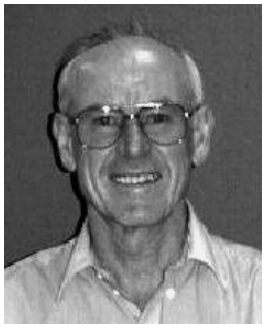
Danielle Moreau is a member of the Active Noise and Vibration Control (ANVC) Group at the University of Adelaide. Her postgraduate research in undertaking her PhD is in the field of acoustics, with the particular focus on noise control engineering. Other areas of interest include the integration, analysis and control of the mechanical and electronic systems within a building, as well as fire engineering and the structural engineering course she is tutoring.

**SWEE KUIK**

Swee S. Kuik is currently doing his research degree in the field of vibration and acoustics with the School of Mechanical Engineering at the University of Adelaide. Before that he worked as an engineer in manufacturing industries for 5 years in the areas of quality management systems, implementation of six sigma, process improvement and production operations.

**XINRUI WANG**

Xinrui Wang received the BE degree from Huazhong University of Science and Technology, Wuhan, China, in 2005. He is currently doing his Master by Research project in the School of Mechanical Engineering, the University of Adelaide, focusing on robot indoor localisation technologies. Since March 2008, he has been a tutor of Structural Analysis and Design.



**LINDSAY DOHERTY**

Lindsay Doherty has lectured Structural Analysis and Design with the School of Mechanical Engineering at The University of Adelaide since 1995. With a career in the water industry spanning 50 years, his work has included water supply and sewerage structures, large dams, hydroelectric projects, as well as major buildings and indigenous homeland developments. He recently retired from Arup Pty Ltd, a global network of engineering consultants.