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Introductory Management

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Anchored Instruction: Its Potential for Teaching Introductory Management

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Abstract: Anchored instruction is one of a number of contemporary approaches to teaching grounded in a technological context such as a video or computer simulation to provide a rich problem-solving environment for students. This paper begins by reviewing the literature on anchored instruction, both by its original proponents and other writers, identifying and reviewing its key theoretical concepts and practical applications. This is followed by a review of some evaluative studies of its use in different educational settings. Its potential for use in teaching an introductory management subject to undergraduate business students with little or no work experience is then discussed, based on preliminary findings of a pilot study that made use of some of the basic concepts and methods of the approach. The findings suggest the approach was well received and has the potential to enhance learning in areas where students have limited “real-life” experience.

Keywords: Anchored Instruction, Undergraduate Management Education, Digital Video Disc (DVD), Computer Simulation

Introduction

STUDENT EVALUATIONS OF lecturers who are pedagogy-driven as opposed to those who are content-driven are generally higher (Saroyan & Snell, 1997). Some of the key pedagogies used by teachers include direct instruction, as well as case-based, problem-based, and project-based learning (Schunk, 2004; Hinchliffe, 2001). A lesser known pedagogy referred to as ‘anchored instruction’ is one of a number of approaches to teaching based on cognitive psychology, in particular, the cognitive apprenticeship model of Collins (Wilson & Cole, 1991). In this approach, the teaching is grounded in a technological context such as a video or computer simulation to provide a rich problem-solving environment for students.

Anchored instruction usually involves the following features:

- technology-based media are used to tell stories,
- students review the story to retrieve data for problem generation and solving,
- students develop solutions and present their ideas to class,
- the advantages and disadvantages of each idea are discussed,
- questions are generated to encourage “what if” thinking about the original scenario, and
- extension problems are used to encourage thinking beyond the initial scenario.

This paper begins by reviewing the literature on anchored instruction, both by its original proponents and other writers, identifying and reviewing its key theoretical concepts and practical application in primary and secondary schools. This is followed by a review of some evaluative studies of its use in different educational and cultural settings. The use of video and written case study material for teaching and learning in the tertiary sector is then reviewed, followed by a report on a study of the use of this material in teaching a university course in International Business. The potential for the use of anchored instruction in teaching an introductory management subject to undergraduate business students is then discussed.

Theoretical Background

Anchored instruction was developed by the Cognition and Technology Group at Vanderbilt (CTGV) over a number of years, in particular from 1990 to 1997. While many people have contributed to its development, the theory has been most closely associated with Professor John D. Bransford, who held a senior role at CTGV before moving to the University of Washington (Bransford & Stein, 1993).

The essence of the approach is to ‘anchor’ teaching and learning in meaningful problem solving environments that replicate real life contexts through the use of video or computer simulations. It has been used mainly with primary school students to develop skills in science and mathematics, but it is considered to be applicable in diverse educational settings (Brown et al, 1989).

Traditional approaches to education have been criticised for their inability to develop essential skills such as divergent reasoning, problem solving and critical thinking (Hannafin & Land, 1997), some authors arguing that there has been a gap between formal school learning and real-life experiences. Anchored instruction has been seen as a means of overcoming that gap, having the capacity to promote authentic learning where students become actively involved in the ‘construction’ of knowledge (Herrington & Oliver, 2000). This is in contrast to the traditional approach where teachers ‘transmit’ information that students ‘receive.’ Constructivist approaches to learning such as anchored instruction involve the use of symbolic and physical models, reasoning and argumentation, as well as the deliberate application of problem-solving strategies to assist students’ learning. It is argued that students are not able to construct knowledge effectively simply by being told new information, but rather need the repeated opportunity to engage in in-depth exploration, assessment, and revision of their ideas (CTGV, 1992b).

Providing these opportunities is considered to be the key means of achieving three specific learning goals of anchored instruction. The first of these is for students to become independent thinkers and learners, rather than performers of basic computations and retrievers of simple knowledge facts. The second is for students to learn to identify and define issues and problems on their own, rather than simply respond to problems that others have posed (CTGV, 1992a). The third is for students to become more effective communicators through collaborative learning situations (CTGV, 1993).

Anchored instruction is also described as a form of ‘situated cognition,’ similar to problem-based and project-based learning where more structure is required (Barron et al, 1998; Brown et al, 1989). It is also similar to case-based learning, where the cases presented are designed to be “explored and discussed rather than simply read or watched” (CTGV, 1992a, 249). Situated cognition provides a framework in which authentic tasks can be utilised within a

teacher-student relationship characterised as a form of ‘apprenticeship training’ (CTGV, 1993; Jarvela, 1998). In a study of the cognitive processes of beginning algebra students engaged in quantitative reasoning, differences in problem representations were found to play a significant part in their learning (Koedinger & Nathan, 2004). However, while problem solving performance was found to be improved by situating the problems in a real world context, the ability to comprehend the symbolic representation of quantitative relations was also found to be important.

Anchored instruction has also been explored within the framework of the following contrasting viewpoints:

- knowledge as ends versus knowledge as means,
- the master versus the apprentice model of cognition,
- macrocontexts versus microcontexts for learning, and
- video versus textual formats in learning materials.

Knowledge as Ends versus Knowledge as Means

One of the main objectives of anchored instruction put forward by its proponents is to overcome the so-called “inert knowledge problem” (Whitehead, 1929), where knowledge is seen as an end in itself rather than as a means to an end. This occurs where knowledge cannot be applied to different situations, problems or contexts outside of the original learning environment, resulting in students not learning how to learn. A key feature of anchored instruction is that it provides a tool for further learning, rather than a set of concepts or facts (Dewey, 1933; CTGV, 1990). Knowledge learned in the context of meaningful activities is more likely to be a means to further learning. Anchored instruction writers also refer to this type of learning as a “generative” and co-operative activity, where learning shifts from an emphasis on the teacher imparting knowledge to students taking more control of their own learning (CTGV, 1992a).

Master versus Apprentice Model of Cognition

Anchored instruction derives some of its theoretical principles from the master versus apprentice model of cognition (Dewey, 1933), where masters (teachers) and apprentices (students) are characterised as having differing capacities to learn. Due to their considerable experience, masters have developed cognitive frameworks for their area of expertise, so that when confronted with new theories, concepts, and principles, they are able to integrate these new ideas into their thinking. Apprentices, on the other hand, do not usually have the cognitive framework to accommodate new concepts.

The introduction of new theories, concepts and principles appear as new facts or mechanical procedures that need to be memorised. Learning for apprentices therefore involves constructing the cognitive frameworks that are a key characteristic of a master’s learning experience. Anchored instruction provides a way of transferring some of the advantages of apprenticeship training in a trade context to formal educational settings involving groups of students (CTGV, 1990). In addition, it may make it possible to create learning experiences that are more effective than many that occur in traditional apprenticeship training. It is argued anchored instruction provides a context where key learning experiences can be planned and facilitated by teachers filling the role of masters, and then experienced by students as appren-

tices, in a situation where the rate of learning is enhanced through participation in specific experiences at a particular point in time (CTGV, 1990).

Macrocontexts versus Microcontexts for Learning

A key aspect of anchored instruction is that it seeks to create learning environments referred to as “macrocontexts,” which seek to simulate reality by incorporating richness and ambiguity for learners. Problems are structured to be factually authentic, incorporating real data and realistic tasks that might be faced in daily life. Learning materials are designed to generate problems to give students the opportunity to formulate approaches to identifying and solving problems (referred to as “scaffolding”), providing opportunities for group interaction (Saye & Brush 2002). The element of realism in the narrative component of anchored instruction is thought to be of value in making learning more engaging and easier to remember, as well as showing students the relevance of their learning to every-day events (CTGV, 1991; 1992a).

A major goal of this approach is to create shared experiences that provide opportunities for sustained exploration of issues by students and teachers, allowing them to become familiar with the tools that experts use in their fields of expertise. This can be useful from a teaching point of view, because a teacher can refer to a particular experience knowing that all students have been exposed to it. In contrast, traditional learning techniques tend to employ “microcontexts” which are much narrower in their focus (CTGV, 1991).

Video versus Textual Formats in Learning Materials

Anchored instruction generally uses some form of technology to create or simulate the macrocontext, the most common being video technologies such as CDs or DVDs. Digital forms are preferable as students can more easily replay sections of a story that they need to review in order to solve particular problems. Other benefits are that video material is more motivating for students, that it supports complex comprehension, and that it is especially helpful for poor readers, while at the same time stimulating competent readers (CTGV, 1992a; 1993). While CTGV took advantage of advances in technology during the 1980s, particularly video, it has not kept up with the changes that have occurred since then such as computer-based simulations. Although these do not play a prominent part in later articles, their potential is acknowledged.

The video material provided in anchored instruction includes all the necessary data to solve specific problems within the macrocontext or story. The design differs from that typically used in educational videos in that the data for problem solving is embedded in interesting and realistic contexts that encourage the active construction of knowledge. This has advantages such as showing the link between specific goals and data selection, motivating students to find the relevant data, and providing enhanced opportunities for reasoning and sound decision making. The problem-solving process also makes students aware of the complexity of many problems, helps them to deal with this, and develops confidence in their abilities to cope with complex situations (CTGV, 1992a; 1993).

Practical Application of Anchored Instruction

CTGV (1997) has applied anchored instruction through “The Adventures of Jasper Woodbury,” a series of problem solving learning experiences comprising twelve video-based ‘adventures’, (including video based extensions and teaching tips) where mathematical concepts are used to solve problems. Mathematical themes from the series include complex trip planning, statistics and business plans, geometry and algebra. In addition to mathematical problem solving, the adventures have extensions to science, history and geography. The adventures are stories rather than lectures, and are designed to be explored by students rather than superficially viewed. In each story, which runs for between 17 and 20 minutes, the characters face a major challenge (CTGV, 1991).

The exercises help to develop a range of learning skills including:

- identifying relevant data,
- considering possible solutions to problems,
- defining sub-goals necessary to solve a problem,
- evaluating potential solutions and deciding on the most appropriate one, and
- communicating one’s reasoning with other class members (CTGV, 1993).

In the “Journey to Cedar Creek” adventure, students have to decide the best way for the main character, Jasper, to get home. This involves taking in to account the cruising speed, fuel consumption, fuel capacity and temporary fuel tank capacity of the cruiser boat he has just bought. Jasper has limited cash to pay for fuel on the return trip, and this must also be taken into account (CTGV, 1991). In addition to having problem solving data embedded within the stories, they are essentially open-ended. Each problem requires the student to undertake at least fourteen steps to reach a solution, with each story usually having multiple solution paths. The problem solving is ‘generative’ in that students must generate sub-problems and sub-solutions in order to solve the major problem. A key value in the process is that it breaks down barriers between subjects, showing students that knowledge and skills developed in one subject, e.g. mathematics, can be applied in other subjects, e.g. history and science (CTGV, 1992a).

The sequence of typical teaching activities in an anchored instruction class often begins with large group activities, then moving into smaller collaborative groups. Throughout all activities, students are allowed considerable leeway in their exploration of the context and problem. The teacher supports this with open ended questions such as “Are there any other ways that one might think about the problem?” After identifying a number of potential approaches to a problem in a large group, small groups work on specific aspects of the problem, later reporting their findings to other groups, and answering questions related to their reasoning. The teacher extends the activity by offering extensions to the basic problem-solving challenge (CTGV, 1992a).

Land (2000) made a number of design suggestions to improve the overall application of anchored instruction in the area of macrocontexts. These include drawing the learner’s attention to key variables and visual cues, including prompts and connections to assist learners to link new material to prior knowledge, and providing explicit scaffolding (metacognition) in the form of teaching-learning strategies to guide students in the problem-solving process.

Similarly, Wilson and Cole (1991) provided a range of practical suggestions to extend the implementation of anchored instruction in teaching and learning contexts. These include:

- content: teach tacit, heuristic knowledge as well as textbook knowledge,
- situated learning: teach knowledge and skills in contexts that reflect the way the knowledge will be useful in real life,
- modeling and explaining: show how a process unfolds and give reasons why it happens that way,
- coaching: observe students as they try to complete tasks and provide hints and help when needed,
- articulation: have students think about their actions and give reasons for their decisions and strategies, thus making their tacit knowledge more explicit,
- reflection: have students look back over their efforts to complete a task and analyse their own performance,
- exploration: encourage students to try out different strategies and hypotheses and observe their effects, and
- sequence: present instruction in an ordering from simple to complex, with increasing diversity, and global before local skills.

Similarly, Azevedo (2005) has argued that the effectiveness of anchored instruction can be improved by helping learners develop the metacognitive skills necessary to learn. In effect, he argues that learners need to learn how to regulate their own learning

Evaluation of Anchored Instruction

In an evaluation of the use of anchored instruction in Year 5 and 6 classes, its effectiveness was examined by comparing beginning and end-of-year measures of students' attitudes, problem-solving abilities and their planning skills. The results indicated beneficial effects in all areas, and in particular, students were found to score above average on standard mathematics achievement tests. It was found that they were not immediately successful at problem identification or formulation, students unfamiliar with finding a problem embedded in a story struggling with such a task in the initial stages. Over time however (four to five group problems), most students demonstrated improvements in this area (CTGV, 1992b).

In another evaluation (CTGV, 1993), it was found that anchored instruction offered clear advantages over other teaching pedagogies. Some of these include:

- it is cheaper and easier to purchase video-based materials than to arrange for the students to have similar real life experiences,
- its introduction is less radical than other novel pedagogies, and is therefore perceived as a less risky incremental change,
- its use promotes equity because it gives those lacking experience sufficient background to engage in discussion,
- it promotes cooperative and collaborative learning because the problems depicted are usually too complex for any individual student to solve alone,
- its visual nature helps students to contribute if they have language difficulties, and
- its use of rich visual material aids communication of complex and novel information.

However, a number of potential weaknesses of anchored instruction have been identified by its proponents (CTGV, 1993). They note that knowledge acquired in real life contexts does not necessarily transfer to other settings, with many of the concepts introduced remaining embedded within the context. They also argue that the learning is highly structured, and is better suited to teaching problem solving than to teaching content. Another risk is that it can be difficult for teachers to change the culture of their classrooms from one in which their role is provider of information to one in which they are a coach and fellow learner. In addition, to support student-generated learning, teachers need to be flexible, and cannot follow a fully scripted lesson plan. They need to be able to recognise when students need guidance to re-conceptualise problems and set themselves on a new and more effective course of problem solving, as opposed to allowing them to grapple in a constructive way with a problem or issue. Teachers may struggle with how to assist their students without being overly directive (CTGV, 1993).

A further risk is associated with the use of technology, as both teachers and students have varying levels of technological literacy. Oliver & Herrington (2003) argue that efforts to develop and implement technology-mediated learning environments do not always work. They need to be carefully planned and developed to incorporate meaningful and relevant activities and tasks, supported in deliberate and proactive ways by the teacher. It is important to provide training and support for the introduction of technology, as without this there is a real risk that teachers will be unable to implement the associated pedagogy successfully.

In an evaluation undertaken by Michael et al (1993), the efficacy of video-based anchored instruction was compared with traditional classroom instruction in the context of analysing US college students' understanding of three language learning theories - operant, sociolinguistic and cognitive. While results demonstrated no significant difference in the performance levels of students in the two instructional groups in the post-test, there was a significant difference in the results in two transfer tests, students receiving anchored instruction scoring significantly higher scores. The authors concluded that video-based anchored instruction can be a valuable instructional tool in increasing students' understanding of theoretical principles. However, they pointed out that further research was needed because of the small sample size of the survey.

In another empirical study, the effects of computer-assisted video-based anchored instruction on Taiwanese primary students' problem-solving skills and their attitudes toward mathematics were investigated (Shyu, 1999). The independent variables were the learning approach (situated learning versus non-situated learning) and the types of media used (video-based CD-ROM computer-assisted instruction versus printed storybook). The dependent variables were achievement in solving mathematical problems and attitudes towards mathematics. A significant difference in students' achievement was found, but no significant difference on their attitudes. Findings demonstrated a significant difference between the CD-ROM group and the control group on achievement. However, there was no significant difference between the printed storybook group and the control group, or between the CD-ROM group and the printed storybook group. These findings suggest that the anchored instruction process was more important than the type of media used.

In a further study undertaken by Shyu (2000), the effects of anchored instruction on the affective and cognitive responses of Taiwanese grade 5 primary students toward mathematics and their problem-solving skills were investigated. The findings suggested that anchored instruction had a positive effect on student attitudes toward mathematics, as well as signific-

antly improving their problem-solving skills. The findings also indicated that all students benefited from the effects of anchored instruction in their problem-solving performance regardless of their mathematics and science abilities. Overall, the authors concluded that video-based anchored instruction provides a more motivating environment that enhances students' problem-solving skills.

On the other hand, a study by Lehrer & Littlefield, (1993) comparing anchored instruction with another form of instruction in the acquisition and transfer of the computer programming language Logo, found that there were few differences in outcomes between the instructional approaches. These results suggest that in the case of Logo learning, instruction is equally effective whether presented with or without a macrocontext framework.

In summing up the evaluations of anchored instruction, it is useful to locate the research within Nuthall's (2004) four major categories of research on teaching effectiveness. These include studies of best teachers, experimental studies of teaching-learning relationships, design studies, and teacher action and narrative research. Design-based research, which includes research into anchored instruction, is not yet recognised as a rigorous methodology (Kelly, 2004; Winn, 2003). However, despite a number of methodological challenges, it has become an increasingly accepted mode of research for the theoretical and empirical study of learning in a range of settings (Bell, 2004). While the empirical studies undertaken by the CTGV and other writers to evaluate the concepts, principles and application of anchored instruction generally appear very positive, further rigorous evaluation is needed to highlight its strengths and weaknesses.

Applicability of Anchored Instruction for Teaching Introductory Management

The current focus on graduates attributes in the design of university courses emphasises general scholarship, research and problem-solving, written and oral communication, critical thinking, as well as personal attributes such as team work and ethical behaviour (Lizzio & Wilson, 2004). These are seen to be qualities that prepare graduates as agents of positive social change in a rapidly changing environment (Barrie 2006). At the same time, Sebastian & Zimitat (2007) argue that the early years of undergraduate studies should concentrate on the development of generic skills through teaching and learning approaches that allow students to engage in the learning process in a more meaningful way.

However, teaching management to undergraduate students presents particular challenges, as many of them have limited experience as members of organisations. They also usually lack experience in managerial or leadership roles (McInnis, 2001). The task of teaching management to these students is therefore more difficult because they lack the contextual and experiential framework for management concepts and theories. Partly as a result of this, undergraduate students typically adopt a surface rather than a deep approach to learning (Johnston, 2001). It has been argued that active student participation in the learning process, and an emphasis on how to learn is critical for encouraging a deep approach to learning (Johnston, 2001), and that students who use deep or strategic learning approaches are more likely to achieve higher levels of academic performance (Byrne, Flood, & Willis, 2002).

The relationship between theory and analysis was examined in a study of commerce students in two second-year organisational theory subjects at a large, multi-campus Australian university (Blunsdon, Reed, McNeil, & McEachern, 2003). It was found that student learning

could be enhanced by integrating the teaching of theory with the analysis of organisational data. A majority of the students reported that they enjoyed this approach, believing that it assisted their learning of concepts and theory, and that it helped them apply the knowledge to practical situations.

Commercial films have been successfully used to develop engaging and effective introductory management subjects (Roth, 2001), where the films provide the central educational vehicle within a lecture and tutorial framework, supported by reading from texts and references, and supplemented by visiting speakers providing students with additional contextual information. However, many lecturers using these films have not been fully aware of anchored instruction design principles involving group problem solving, and therefore have not taken full advantage of the use of films in teaching students how to learn from them (Dede, 1996).

In addition, text book and commercial case studies have been widely used in teaching management courses to undergraduate students for many years within a context similar to that outlined above in the use of films. The following are some of the benefits of case studies identified in the literature. They are said to:

- link theory with practice (Higher Education Academy, 2006),
- promote the development of students' higher order thinking skills (Lizzio & Wilson, 2004),
- emphasise learning over teaching (Kember, 2000; Zeegers & Martin, 2001),
- engage students as active participants in the learning process (Driver, 2001),
- be problem based (Yeo, 2005),
- be meaningful and interesting to students (Dechef, 2005; Paul & Mukhopadhyay, 2004),
- be practical and useful (Furco, 2005), and
- improve understanding of how successful firms operate in the global environment (Honig, 2004).

While case studies can go beyond the simple description of events, and can incorporate problem solving, on their own they lack the visual impact that can engage students by showing real people in actual situations. Other disadvantages of traditional written case studies include their second-hand reporting of events, making them less immediate and less interesting (Dechef, 2005), their tendency to be culturally-oriented to their country of origin, and their lack of correspondence with the specific content and objectives of particular courses. It is the combination of concepts associated with the written case study approach, and the visual imagery provided by film, together with a number of other principles, that provide the particular advantages of the anchored instruction approach.

Pilot Study

A small-scale pilot study was undertaken to report on a project which incorporated major elements of anchored instruction, including video-based case studies on Australian small and medium-sized enterprises, to highlight key issues in an undergraduate university course in International Business. The key objective of the project was to use the analysis of the audio-visual case studies and supplementary written material to transform the teaching of the course into a stimulating learning environment for the students. Sub-objectives of the program included:

- using the audio-visual cases to add credibility to the themes raised in the lectures and tutorials, as well as in the texts and references, in relation to Australian SMEs,
- enhancing the learning by making it student-centered rather than teacher-centered,
- encouraging students to think creatively in formulating solutions to complex International Business problems and issues faced by Australian companies, and
- helping students enjoy their studies.

To ensure a close alignment between the issues covered in the audio-visual cases and the course content, preliminary interviews were held with the owners or managers of the selected firms to identify relevant issues. These were then used as the basis for the questions put to the interviewees for discussion. A documentary style format was adopted similar to that used in television interviews where the interviewer is not seen or heard, and the interviewee provides a narrative about the business. The project was able to draw upon the expertise of a specialised audio-visual production centre within the university for advice on planning and implementation of the project, making it possible to produce the custom-made material at a cost well below normal commercial rates. Students viewed the audio-visual cases during their lectures, and prepared answers to the questions which were discussed in the tutorial-group workshop session held the following week.

In a limited initial evaluation of the project, a sample of the students enrolled in the course was surveyed using a questionnaire based on an analysis of key issues emerging from the literature. Being a pilot study, the survey was limited to a random sample of half the students enrolled in the course at one of the smaller campuses of the university. From the 80 students surveyed in the relatively homogenous group, 36 valid responses were obtained, a response rate of 45 percent. Students were asked to respond to questions on a five-point scale where scores higher than three were treated as positive responses. SPSS was used in the analysis of the responses to the questionnaire. The results were compared with separate student evaluations of the course, with the comparisons showing similar responses.

Key findings included the following views on the benefits of incorporating AV case study material in the course:

- 86 percent thought it had improved their understanding of how successful firms operate in a global environment,
- 82 percent felt that it had made their learning more effective through first hand “face-to-face” reporting of examples of real world business challenges,
- 81 percent believed that it had made their learning more interesting,
- 80 percent considered that their overall learning had been enhanced,
- 79 percent believed it had helped to illustrate the link between theory and practice,
- 79 percent thought they had gained a better understanding of international business issues,
- 76 percent considered that it had made learning more efficient by reinforcing their understanding of the concepts and issues covered in the lectures,
- 72 percent felt they had gained a ‘real world’ perspective on how firms operated in the global environment,
- 68 percent said that it had helped them understand the challenges faced by SMEs,
- 62 percent thought it had encouraged them to think more deeply about topics, rather than just trying to remember what was said about them,
- 56 percent agreed that it had made learning more enjoyable,

- 53 percent felt that it had improved their ability to formulate solutions to problems not previously encountered, and
- 47 percent said that it had encouraged them to want to learn more about the subject matter, even though only 20 percent of the students had indicated an intention to major in International Business (Wickramasekera et al, 2009).

Conclusion

We believe the adoption of anchored instruction in undergraduate management courses, by combining the advantages of traditional film and written case-study approaches, together with other anchored instruction principles and techniques, would be useful in promoting experiential learning, and would provide a link between theory and practice. Anchored instruction is particularly suited to developing group decision making and problem solving, skills that are important for people moving into organisational and managerial roles.

Most of the advantages of anchored instruction identified in the literature for primary and secondary students also apply for undergraduate management students. Both purchased commercial films and those designed and produced by university teaching and technical staff can be used for a number of years, and are therefore more cost-effective than arranging for students to have similar real-life experiences. They also capture stories of firms and the people involved who might not be accessible to students at other times.

Issues of student equity and language ability identified in the anchored instruction literature are also relevant in the university context, where students from a wide range of socio-economic and cultural backgrounds come together, some with a greater breadth of experience than others. In some undergraduate courses there can be a mix of more mature students already in the workplace, and those who are recent school-leavers with little or no relevant work experience. In addition, there is an increased number of overseas students enrolled in many courses, many of whom have English as a second language, and who face difficulty in coping with the specialised meaning of terms in the management discipline. The use of anchored instruction case study material can help to overcome the socio-economic, cultural and language inequalities, as well as help to improve communication skills.

Another major advantage of anchored instruction in undergraduate management courses is that it can be used to promote a co-operative and collaborative learning environment where students can work in teams to solve problems emerging from the case study material. As well as allowing students to draw upon the range of knowledge and skills in the group, it gives them the experience of teamwork which is one of the main graduate attributes sought by employers.

While some of the potential weaknesses of anchored instruction identified earlier in this paper for primary and secondary students may have some relevance for undergraduate university students enrolled in management courses, they appear to be less severe. The greater maturity and extra life experience of the tertiary students give them an increased ability to “transfer” knowledge and skills acquired in one context to another, helping them to apply concepts in new situations.

The argument that learning through the anchored instruction approach is highly structured and better suited to problem solving than to teaching content has limited applicability in the management education context. While lecturers frequently comment on the pressure to cover a large amount of subject content in a limited amount of time, they recognise that

achieving course objectives associated with the graduate attributes of problem solving and teamwork requires a balance between the acquisition of knowledge and the development of skills. It is also recognised that a great deal of knowledge can be gained through the case study approach, particularly in terms of concept development and linking empirical evidence to theory.

Similarly, the arguments that it can be difficult for teachers to change the culture of their classrooms from being teacher-centered to student-centered, that teachers need to be flexible in their use of scripted lesson plans, and that they need to recognise when students need guidance, do not appear to be major problems in the tertiary context. While traditional formal lectures, often based on the use of Powerpoint presentations, may reflect some of the above criticisms, the long history of the use of tutorial and workshop sessions in university education indicates that flexible approaches are also widely used.

In addition, the risk associated with the use of technology for both teachers and students appears to have decreased in the period since the warning was made in the literature. Both lecturers and students are now much more technically 'literate,' and universities are now much better equipped with sophisticated audio-visual equipment. Teachers and students are also now familiar with access to and use of video material on the Internet (Dickey, 2005; Kirkley & Kirkley, 2005). However, equipment can still fail on occasions, and the advice on the need for careful preparation in the use of technology remains relevant.

Consequently, the potential weaknesses of anchored instruction identified for primary and secondary education do not appear to be significant problems for tertiary students. In contrast, many of the advantages identified seem to be equally, if not more relevant for the more mature tertiary students. Key advantages identified in the group studying International Business include bridging the gap between formal learning and real-life experiences, helping students identify and define issues on their own, assisting the development of a range of research skills, encouraging a view of learning as a means rather than an end in itself, applying learning to contexts outside the original learning environment, and helping students develop the cognitive framework that will enable them to assimilate new learning.

The above advantages are ones that could be achieved in adopting a more carefully planned approach to the use of anchored instruction in the teaching of an introductory management subject at university level. The practical application of the approach at the primary and secondary level provides lessons for improving the current use of video and written case-study material in the tertiary sector. In particular, this would involve more careful planning in the preparation of teaching materials to ensure that the objectives of the subject are met, not just in terms of content, but also in the range of skills and attributes that anchored instruction has shown to have the potential to develop.

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