

TITLE OF PAPER**WORK INTEGRATED LEARNING AND STUDENT ASSESSMENT****AUTHOR**

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THE ABSTRACT

CONFERENCE THEME : Incorporating WIL in the learning programmes

MEANS OF PRESENTATION : Discussion paper: Overheads and assessment material examples (copied)

ABSTRACT

In a recent study on Civil Engineering students' perceptions of the experiential learning experience, it was, inter alia, pointed out that 67% of the students agreed that experiential learning should be assessed and that the institution should primarily carry out the assessment.

The question arising from this, is HOW you assess, as there is normally a curriculum, which determines the WHAT.

At higher education, it is the higher order of Bloom's Taxonomy that has to be developed, and in this context, experiential learning is a useful means to assist in the practice and assessment of the mastery of it.

Assessment has to be structured in such a manner, that it clearly demonstrate the integration and application of the theoretical principles in the learning environment in industry.

It thus create the challenge for co-operative education lecturers to develop creative assessment material.

The presentation will focus on specific assessment methods used for cost account students at this institution, eg. own cv compilation, only after an evaluation session of dummy cv's; oral presentations; written assignments etc. The value and objective of each method will be discussed based on Bloom's Taxonomy.

INTRODUCTION

Learning and assessment are two integrated and inter-related concepts. Within the traditional education milieu it is common practice that assessment is the mechanism to determine whether

learning has in fact occurred. Gray (2001) states that “most people, particularly those teaching in HE, and probably students as well, seem to view assessment as part of ‘the system’.

In some higher educational institutions there is the notion that learning is not only campus/lecture room bound, but also off-campus, mainly within industry, who is then coming on board as a third partner in the education process. This is commonly known as experiential learning / work integrated learning/co-operative education. Harvey (1999) refers to it as the “employer-higher education interface” and also states that “.....the primary purpose of higher education is to transform students by enhancing their knowledge, skills and abilities” more specifically “....the higher-level intellectual skills of synthesis, analysis and critique”.

Notwithstanding the important role this new partner will play in the learning of the student, the ultimate control over the learning component remains with the educational institution, and it will be instrumental in the assessment that has to take place whilst the student is in industry. To assess learning, there must be a reflective process because “.....the experience of work is not enough in itself. It is the learning that comes from it that is important. This requires systematic reflection....facilitated through the institution.” (Harvey (1999). It is thus imperative that this arrangement should be made known to the student and the industry partner before the experiential learning period commences.

Assessment of experiential learning has a three-fold influence: firstly, it poses a challenge to the education institution for relevant curriculum development, as the term experiential learning (or similar names associated with the concept) must be fully understood by academics. Secondly, industry must create the environment in which experiential learning experiential learning can take place. Thirdly, it is an opportunity for students to demonstrate their mastery, integration and application of their theoretical underbuild. In a recent study on civil engineering students’ perception of the experiential learning experience, it was pointed out that 67% of them were in favour of the assessment of their experiences and that the education institution should perform the assessment (Miller, et al, 2005).

ASSESSMENT

For the purpose of this paper, the following premises will apply:

- The assessment criteria and methods that will be discussed, is that for the cost and management accounting diploma at the Cape Town campus of the Cape Peninsula University of Technology.
- The students are all 3rd years.
- It is the author’s opinion that at a tertiary level, the higher order of Bloom’s Taxonomy has to be developed in students, and
- Experiential learning is an appropriate vehicle to demonstrate the mastery of it.

The various components of Bloom's Taxonomy (1984) are:

- Knowledge
- Comprehension
- Application
- Analysis
- Synthesis
- Evaluation

(see annexure A for a detailed description)

It is possible that the mastery of these components can be assessed in a controlled educational environment, eg a case study in a formal examination. However, the world of work is constantly faced with new problems and challenges. This creates an ideal situation for the direct application of learning to the real world of work as "work-based learning views learning as arising from action and problem-solving within the work environment, and this is centred around live projects and challenges...." and then "assessment becomes not merely a means of judging knowledge and performance, but an integral part of the learning process itself" (Gray, 2001).

The assessment based on Bloom's criteria poses challenges of its own. Firstly, each student's work environment is different (not the same responsibility, authority for decision-making, exposure to a variety of tasks). Organizations in which the learning and talent of students is encouraged and promoted, is not always on your database. Secondly, it is not easy to quantify all the criteria in terms of percentages or grades when assessing the higher order aspects of analysis, evaluation and synthesis. Thirdly, the experiential learning assessment should also comply with the principles of validity, reliability and authenticity. In this context, David Gray (2001) re-iterates the afore-said by stating that "the novel and innovative nature of work-based learning requires that non-traditional means have to be found for assessing it, such as approaches that meet the (sometimes differing) needs of learners, employers and higher education institutions. The use of traditional assessment methods such as formal examinations is entirely inappropriate to the philosophy, educational objectives...Assessment methods need therefore to be tailored to a student-centred, problem-based approach."

METHODS OF ASSESSMENT

In an endeavor to encapsule the development and mastering of the higher order of Bloom's taxonomy, a variety of assessment tools are tried and continually refined by my institution. Some of them are applied on-campus during the work-preparedness phase, whilst the majority is used for the assessment of (learning) activities performed in the work place.

The following are some assessment tools used:

- on-campus during work-preparedness skills sessions(six months before placement in industry):
 - problem-solving and decision-making: moon landing survival simulation exercise.
 - cv writing: real student cv's being scrutinized for short-listing.
 - Maier's horse trading problem: a subject related problem

- in the work place:
 - oral presentation: 5 minutes presentation on work experience
 - written assignment: topic set by institution
 - employer evaluation: completed at end of work period by employer.

See annexures B, C, D, E, F, G (tools for the above-mentioned assessments).

For the purpose of this paper, only the sections in the annexures that are aimed at the higher order of Bloom's Taxonomy will be highlighted and discussed.

EVALUATION OF THE VARIOUS ASSESSMENT TOOLS

- Problem-solving and decision-making: this exercise requires that the student have to use previously obtained knowledge, eg physical science at school on magnetism, solar power, weightlessness on surface of the moon, to solve the problem. The individual's ability to solve the problem is demonstrated if it's error score is the lowest in the group. Further, group decision-making will indicate the importance of teamwork if the error score of the group is lower than that of the individual. Learning in terms of comprehension, application, analysis and evaluation has taken place. The students' efforts are recorded on an answer sheet (see annexure). They are later given a typical industry problem, eg on low productivity, where they have to apply the steps in the decision-making process, which is also assessed.
- CV writing: students working in a group have to scrutinize five cv's of their peers of the previous year and to come up with a ranking/short-list. They learn to evaluate cv's and have to motivate their choices, as well as how to compile their own cv meeting certain standards. Their individual cv's are assessed and a mark allocated by the lecturer. Cv's send to companies are then of a higher standard.
- Maier's horse-trading problem: two typical financial transactions of buying and selling is given to students. They have to calculate the profit made from these two transactions and to prove their answer by applying the underlying accounting principles. Their answers are handed in for evaluation. The results are quite shocking, as many are not able to apply the basic principles.
- Oral presentations: students have to choose their own topics based on the work that they do at the company. They invite their supervisor(s) and colleagues to sit in on the presentation. Questions are thrown in during the presentation by the co-ordinator as well as the audience. Students learn to plan, organize the whole presentation. They also have to demonstrate a holistic grasp of their company's financial activities, as well as to answer questions out of their sphere of work, eg any recommendations or problem solving. Most of the students obtain good marks for their presentation skills, as per the evaluation sheet. Feedback from the company representatives is mostly positive. The students also express the value of this exercise as positive in their feedback.
- Written assignment: a document on the accountants' role in the organization serves as a source of reference for this assignment. The student identifies five critical considerations of the accountant's role from this document as well as the five main functions in their own department have to be described. The assignment expect from them to apply the critical considerations for an effective accounting system on the functions performed in their own department. Comprehension, application, analysis, synthesis and evaluation have to be demonstrated in the written assignment. The majority of the students are able to do this, as illustrated in the marks allocated for their assignment. The company also has to read through the assignment and have to make a comment on it, which is mostly positive.

- Employer evaluation: the students' performance of their daily tasks is evaluated at the end of the experiential period. The employers comment on the students' teamwork, communication, achievement of results and customer and business orientation. This is always very positive as indicated in the evaluation documents.

CONCLUSION

Assessment as an integral component of learning has to be structured around Bloom's taxonomy (or related theories, eg cross field outcomes) to demonstrate the integration and application of theoretical principles in the place of work by students. According to Harvey (1999), 'work experience must be fundamentally about developing the learner, not training students to do specific jobs.'

There are various assessment tools available for different competencies and circumstances. Some assessment tools can be used for on campus learning, during the period of work preparedness, eg cv writing, problem-solving. Others are used in the work environment, eg oral presentations, employer evaluations.

The compilation of effective assessment tools requires a continuous evaluation and adaptation of existing tools to ensure an objective evaluation of students' competencies. It must also reflect 'the effectiveness of work experience' (Harvey 1999). Bloom's taxonomy higher order competencies are manifested in attributes in the world of work as effective communication, problem solving, teamwork and interpersonal skills.

Although students will have to prove their competency by demonstrating the attainment of pre-determined skills and attitudes, students will additionally have to 'write about it' (Gray 2001) as well. This writing is primarily captured in the assessment tools as described in the afore-going paragraphs.

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6. Horngren, Dator, Foster & Uliana, (1999) "Cost accounting in South Africa", Prentice Hall SA (Pty) Ltd.

APPENDIXES

- A. Bloom's Taxonomy
- B. NASA: Survival on the moon
- C. CV writing
- D. Maier's Horse Trading problem
- E. Oral presentation competency assessment
- F. Written Assignment
- G. Competency assessment by employer

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Appendix A

BLOOMS TAXONOMY

<p>Knowledge: Recall data or information</p>	<p>Examples: Recite a policy. Quote prices to a customer. Knows the safety rules.</p> <p>Key Words: defines, describes, identifies, knows, labels, lists, matches, names, outlines, recalls, recognizes, reproduces, selects, states.</p>
<p>Comprehension: Understand the meaning, translation, interpolation, and interpretation of instructions and problems. State a problem in one's own words.</p>	<p>Examples: Rewrites the principles of test writing. Explain in one's own words the steps for performing a complex task. Translates an equation into a computer spreadsheet.</p> <p>Key Words: comprehends, convert, defends, distinguishes, estimates, explains, extends, generalizes, gives Examples, infers, interprets, paraphrases, predicts, rewrites, summarizes, translates.</p>
<p>Application: Use a concept in a new situation or unprompted use of an abstraction. Applies what was learned in the classroom into novel situations in the work place.</p>	<p>Examples: Use a manual to calculate an employee's vacation time. Apply laws of statistics to evaluate the reliability of a written test.</p> <p>Key Words: applies, changes, computes, constructs, demonstrates, discovers, manipulates, modifies, operates, predicts, prepares, produces, relates, shows, solves, uses.</p>
<p>Analysis: Separates material or concepts into component parts so that its organizational structure may be understood. Distinguishes between facts and inferences</p>	<p>Examples: Troubleshoot a piece of equipment by using logical deduction. Recognize logical fallacies in reasoning. Gathers information from a department and selects the required tasks for training.</p> <p>Key Words: analyses, breaks down, compares, contrasts, diagrams, deconstructs, differentiates, discriminates, distinguishes, identifies, illustrates, infers, outlines, relates, selects, separates.</p>
<p>Synthesis: Builds a structure or pattern from diverse elements. Put parts together to form a whole, with emphasis on creating a new meaning or structure.</p>	<p>Examples: Write a company operations or process manual. Design a machine to perform a specific task. Integrates training from several sources to solve a problem. Revises and process to improve the outcome.</p> <p>Key Words: categorizes, combines, compiles, composes, creates, devises, designs, explains, generates, modifies, organizes, plans, rearranges, reconstructs, relates, reorganizes, revises, rewrites, summarizes, tells, writes.</p>
<p>Evaluation: Make judgments about the value of ideas or materials.</p>	<p>Examples: Select the most effective solution. Hire the most qualified candidate. Explain and justify a new budget.</p> <p>Key Words: appraises, compares, concludes, contrasts, criticizes, critiques, defends, describes, discriminates, evaluates, explains, interprets, justifies, relates, summarizes, supports.</p>

Appendix B (1)

NASA: SURVIVAL ON THE MOON*

Instructions

You are a member of a space crew originally scheduled to rendezvous with a mother ship on the lighted surface of the moon. Due to mechanical difficulties, however, your ship was forced to land at a spot some 200 miles from the rendezvous point. During re-entry and landing, much of the equipment aboard was damaged and, since survival depends on reaching the mother ship, the most critical times available must be chosen for the 200-mile trip. Below are listed the 15 items left intact and undamaged after landing.

*PART 1**Individual Decision Making*

Each member of the group working individually should rank the 15 items in terms of their importance for your crew in allowing them to reach the rendezvous point. Place number A1" by the most important item, number A2" by the second most important, and so on, through number A15", the least important. You have 15 minutes to complete part 1.

Appendix B (2)

Item	Your Ranking 1 to 15	Your Error Score	NASA's Rankings 1 to 15	Team Rankings 1 to 15	Team Error Score
Box of matches	_____	_____	_____	_____	_____
Food concentrate	_____	_____	_____	_____	_____
Fifty feet of nylon rope	_____	_____	_____	_____	_____
Parachute silk	_____	_____	_____	_____	_____
Solar-powered portable heating unit	_____	_____	_____	_____	_____
Two 45-caliber pistols	_____	_____	_____	_____	_____
One case of dehydrated milk	_____	_____	_____	_____	_____
Two 100-pound tanks of oxygen	_____	_____	_____	_____	_____
Stellar map (of the moon's constellation)	_____	_____	_____	_____	_____
Self-inflating life raft	_____	_____	_____	_____	_____
Magnetic compass	_____	_____	_____	_____	_____
Five gallons of water	_____	_____	_____	_____	_____
Signal flares	_____	_____	_____	_____	_____
First-aid kit containing injection needles	_____	_____	_____	_____	_____
Solar-powered FM receiver/transmitter	_____	_____	_____	_____	_____

Your Total Error Score _____

Team's Total Error Score

Appendix C

INDUSTRY EXPOSURE

MODULE A (INTERNAL AUDITING)

DATE: _____

VACANCY: JUNIOR INTERNAL AUDITOR

COMPANY: OLD MUTUAL

SHORT LISTING OF CANDIDATES:

- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____
- 6 _____
- 7 _____

DEPARTMENTAL REPRESENTATIVES NAMES:

- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____
- 6 _____
- 7 _____

Appendix E

Oral Presentation Competency Assessment

Student Name:..... Student No:.....

Course..... Date:.....

Topic:.....

Name of
Supervisor:.....

Critical Outcome	Assessment Criteria	Assessment		
		A	B	C
1. Structure content of presentation in logical and clear pattern.	1.1 The presenter introduced himself/herself correctly	A	B	C
	1.2 A clear layout, covering the content of the presentation, was used.	A	B	C
	1.3 The introduction was striking and effective.	A	B	C
	1.4 Background to the topic was given in a concise manner.	A	B	C
	1.5 A logical development of information was followed to explain content.	A	B	C
	1.6 The key issues were clearly explained.	A	B	C
	1.7 The key aspects were linked up in a logical manner.	A	B	C
2. Show sufficient application of Accounting / Cost Accounting knowledge	2.1 A clear understanding of Accounting / Cost Accounting concepts was exhibited.	A	B	C
	2.2 Questions were correctly answered.	A	B	C
3. Establish audience reach in a professional manner.	3.1 The presentation was done in a lively manner.	A	B	C
	3.2 The presenter was neatly dressed.	A	B	C
	3.3 The presenter maintained effective eye contact.	A	B	C
	3.4 Gestures (hands, etc.) were used to good effect.	A	B	C
	3.5 Variation in voice was used to good effect.	A	B	C
	3.6 The use of language was correct.	A	B	C
	3.7 Irritating mannerisms were avoided	A	B	C

Critical Outcome	Assessment Criteria	Assessment		
4. Handle audio-visual material and equipment effectively e.g. overhead projector, PowerPoint, any other	4.1 Audio-visual material was handled skillfully.	A	B	C
	4.2 Everyone could clearly see the display of the audio-visual material.	A	B	C
	4.3 The audio-visual material supported the central theme of the presentation.	A	B	C
	4.4 Audio-visual equipment was set up properly before the start of the presentation.	A	B	C
TOTAL				
MARK				

Key: A = Superior 85%
 B = Competent 70%
 C = Needs Improvement/Not Yet Competent

Appendix F

ASSIGNMENT

With reference to the document **The Accountant's role in the Organisation**, perform a critical analysis and evaluation of the accounting and/or cost accounting functions of the organisation where you are accommodated for your experiential learning period.

Instructions

1. Prepare a report of 6 – 10 typed pages on the abovementioned topic (excluding the Title Page and Table of Contents).
2. The report must be read and commented on by your organization.

Content and format

1. Title page (topic, student name and number)
2. Table of contents
3. Introduction
 - the organization's background, products and services
 - your role and functions and that of your department(s)
4. Investigation
 - 4.1 Analysis
 - 4.1.1 Study the document **The accountant's role in the Organisation** and then select five (5) criteria you think is critical for an effective accounting/cost accounting system in any organisation (for example **Control**). Explain each one of the five criteria in a paragraph.
 - 4.1.2 Identify and describe five (5) primary functions of the accounting and/or cost accounting departments of your organisation
 - 4.2 Evaluation
 - 4.2.1 apply your theoretical considerations on these departments(s)' functions (motivate whether these functions meet/not meet the criteria as identified in the document)
5. Conclusions
 - have criteria been met/not met. Give reasons for your response.
6. Recommendations
 - suggestions/improvements
7. Closing remarks

Appendix G

COMPETENCY ASSESSMENT BY EMPLOYER

Student Name: Student No
 Course:

Key: A = Superior
 B = Competent
 C = Needs improvement

Critical Outcome	Assessment Criteria	Assessment		
		A	B	C
1. Solve practical problems in industry through the application of Accounting or Cost Accounting or Financial Information Systems principles and techniques	1.1 The problem is correctly identified	A	B	C
	1.2 The correct approach in solving the problem is chosen and justified	A	B	C
	1.3 The solution is evaluated with reference to the identified problem	A	B	C
2. Achievement of required results through self-management, project management and/or line responsibility	2.1 Planning is done, including forecasting, setting objectives, scheduling and budgeting	A	B	C
	2.2 Organising is done	A	B	C
	2.3 Leadership abilities are demonstrated	A	B	C
	2.4 Controlling is done, including setting objectives, measuring, evaluating and correct performance	A	B	C

Critical Outcome	Assessment Criteria	Assessment		
3. Work effectively in a team environment	3.1 Personal responsibilities in the team are accepted and carried out	A	B	C
	3.2 Communication with reference to technical aspects is effective	A	B	C
	3.3 Relationships, respect and trust are built and maintained with all relevant parties	A	B	C
4. Customer and business orientation	4.1 Specific customer or company needs are identified and met	A	B	C
	4.2 Works collaboratively with customers and suppliers, including other departments	A	B	C
	4.3 Demonstrates business awareness / cost implications in all work performed	A	B	C

.....
 Name of Supervisor Signature Date

Student Signature: