Applying the Mexican Hat Approach' to GEES subjects – an evaluation

Paul N. Wright

Southampton Solent University

Abstract

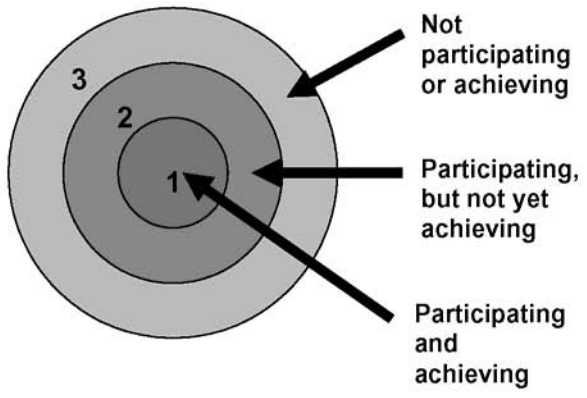
The Mexican Hat Approach (MHA) is a learning intervention to help record and monitor levels of progress, participation and achievement during study. At Southampton Solent University, a combination of the MHA with an activity-based approach was found to help tutors to identify students potentially 'at risk' but not to fully enable students to make robust self-assessment judgements. A refinement of the model could be developed that nurtures better reflective capabilities within students.

Introduction

The Mexican Hat Approach (MHA) was a learning intervention originally conceived to help both staff and students record and monitor levels of progress, participation and achievement within units of study (Robinson and Udall, 2003). It identified a number of key concepts that, it was felt, were important to student learning. Firstly, it identified students who were, or were not, attending the session. Secondly, it asked students to rate their levels of participation in individual or group activities, both large and small. Finally, it required students to record their perceived level of achievement, by which was meant self-assessment against some session objectives. Thus, a model was identified, that classified students as falling into one of three regions during the session: attending, but not participating; participating, but not yet achieving; and participating and achieving (see Figure 1).

It was argued that different interventions could be adopted depending upon where students placed themselves in this model. Non-participants might be encouraged to do so by different activities, those not yet achieving the objectives of the session could be given extra help, and achieving students might be given up 'follow up' tasks, in order to 'extend' themselves.

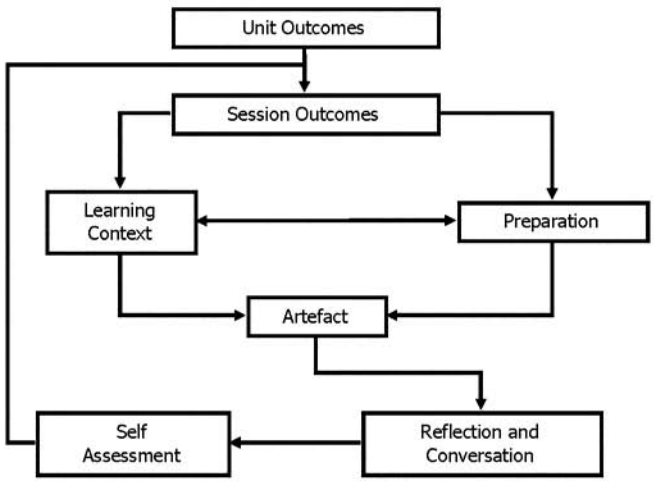
Figure 1. A conceptual model of the MHA



Delivery method

A refined model of the MHA (Robinson and Udall, 2005) saw a framework based upon preparing, doing, and reflecting, mediated through progress recording and self-assessment against intended session outcomes, rather than objectives (see Figure 2). Individual session outcomes were designed as pared-down versions of summatively assessed unit outcomes. The message here was simple: build up your experience of achieving the types of outcomes that you will be finally assessed on, and receive weekly feedback on your progress. Self-assessment was moderated through the use of a conversation with the tutor regarding student progress. The framework was designed to achieve all of this within manageable workloads for both students and staff. The framework was designed to be affirmative in nature, so that students can identify relative levels of success, on an ongoing basis, by monitoring their own participation and achievement i.e. meeting the learning outcomes of the session.

Figure 2. Flow chart showing the progression of a teaching session using MHA.



Up until this project, the MHA had been run at Southampton Solent during practical or lecture-based units. A potential improvement was suggested by combining the framework with an activity-based approach (here referred to as Activity Based Learning, or ABL). Here the students were expected to prepare work before each session, usually drawing a précis from a number of texts or lecture notes, forming a mind map, or preparing questions to ask. These artefacts were both hard evidence of preparation, as well as the only 'notes' of the session that might exist within student files. In other words, students were solely responsible for identifying and synthesising content. This allowed teaching sessions to focus on activities that used this content in order to work towards higher levels of outcomes, in the sense of the SOLO Taxonomy (Biggs, 1999). [Fig of SOLO]

Box 1. Biggs' Structure of the Observed Learning Outcome (SOLO) Taxonomy

SOLO stands for Structure of the Observed Learning Outcome, and provides a systematic way of describing how a learner's performance grows in complexity when mastering many tasks. A general sequence in the growth of the structural complexity of many concepts and skills is postulated, and that sequence may be used to guide the formulation of specific targets or the assessment of specific outcomes.

A **uni-structural** response might outline, define or accurately describe a topic.
A **multi-structural** response might outline two or more themes but not bring together or relate them.
A **relational response** will describe themes, and also their interaction and balance.

An **extended abstract** response would build further on a relational response and also set within wider contexts.

These concepts are described further in: Biggs, J.B., and Collis, K.F. (1982) *Evaluating the Quality of Learning: the SOLO Taxonomy.* New York:Academic Press.

(Adapted from: Biggs' Structure of the Observed Learning Outcome (SOLO) Taxonomy, Teaching and Educational Development Institute, University of Queensland.)

The activities were largely problem and scenario based, in groups of three or four, drawn from the author's previous experiences with Problem Based Learning (PBL) (Wright, 2003). However, this approach refocused from the more 'learning-to-learn' and fuzzy problems associated with PBL, to smaller, more bounded problems. This was in response to previous student feedback, which identified anxieties in the 'purer' PBL approach, disquiet that has been identified elsewhere (Hutchings and O'Rourke, 2003). Teaching, however, as with PBL, became more of a facilitating exercise. These problems yielded artefacts, in terms of posters and presentations, which could be shared with the class for a broader discussion about the themes of the exercise, the attainment of outcomes, and the relative strengths and weaknesses of the responses.

Some students expressed dissatisfaction with workload. The preparation work was kept to a minimum, and should have taken no more than one to two hours per session to complete properly. This guided but independent study time was well within the prescribed limits set down at the unit's validation.

Evaluation methodology

Whilst there had been a previous evaluation of the MHA framework within Engineering (Robinson and Udall, 2004), this project focussed on transferability of the method into the GEES disciplines, and decided to focus on potential improvements to the framework.

Evaluation of the student experience of a Level Three unit in Marine Pollution Management, and an MSc unit in Pollution from Shipping and Port Operations, was collected at five points:

- An early 'Keep-Add-Change' exercise to identify teething problems; these were collated, and the feedback shared with students, in order to acknowledge their voice in the developmental process
- A 'Learning Perceptions' questionnaire later on in the first term. This asked students to identify how clear their expectations were relating to the unit and its workload, and how students perceived the learning situation. Prosser and Trigwell (1999) report that students who have clear goals and expectations, and realise that learning is more than rote memorisation of facts tend to exhibit a deep approach to learning (Marton & Säljö, 1976)
- Two focus groups, the first of which was held early on in the unit after the first few sessions, the second towards the end of the unit, prior to the examination. The first session was designed to explore general themes around learning. The second was designed to explore emergent themes around the delivery method specifically.
- An end of unit questionnaire. This asked students to compare their experiences in the unit to others, identify benefits and concerns, and to suggest improvements in the process.

Attendance, participation, and engagement

Firstly, it was clear, from attendance monitoring, that attendance increased from previous years, running at 90% for the majority of weeks. Some students suggested that the mere recording process encouraged them to attend. Whilst non-attendance was addressed by a tutor-initiated email, this ceased after the first five weeks, as students appeared to be less likely to 're-offend', and, often, apologised before, or just after, missing sessions.

Secondly, through recording and classroom observation, there was, more often than not, evidence of preparation. Students reported that the need to have something to refer to for the sessions facilitated this. This weekly evidence seemed to fly in the face of colleagues' perceptions of students' attitude to academic work that is not summatively assessed. Preparation for the sessions and the subsequent activities was seen as important in developing a real understanding of the subject area. The conversation in groups, with peers, and the tutor were also identified in this context. As a result, students within the focus groups identified that they were 'missing out' if they failed to attend sessions, as opposed to the ease with which lectures could be missed, and identified this as one of the motivating factors related to attendance.

Engagement, i.e. making 'meaning' from the information, was visible but variable. For the first time, by looking at session outcomes, and by pitching these outcomes towards the higher levels of the SOLO Taxonomy, both students and tutor could identify to what extent student thinking was developing, and to what extent students were achieving (or not). Moreover, this frequently developed into conversations regarding final assessments and student/tutor expectations vis-à-vis marking criteria.

Delivery and the learning context

Students identified both carrots and sticks that influenced these results. On the plus side, students identified interesting and enjoyable sessions as a spur to their attending, whilst monitoring and 'lack of notes' forced their hands on other occasions (the stick).

> *Student 1: 'so I do often hear when we walk away, people saying it was quite a nice (session), it's a pleasant experience rather than sitting there mind-numbingly taking notes …'*

This was associated with the sense that the learning experience was relaxed and as a result this promoted learning:

> *Student 2: '… really relaxing way, and I think that you learn much better when you are relaxed and when you are just sitting*

and trying to copy everything down, you don't learn anything,g you're just copying so there is no point'

Initially, students highlighted the importance of learning by doing, and relating their learning experience to the real world. Students saw little value in lectures unless they contained purposeful interaction. However, students were clearly anxious about ABL, in the first few weeks, particularly in relation to 'what we should learn' and although they did not value lectures they liked the fact that they resulted in 'notes'.

Some students at first felt that they were 'not learning anything' through the activities, although this was linked to a conception amongst these students that learning was associated with 'getting new knowledge'. This, however, was not a unanimous conception amongst the group as others conceptualised learning as applying knowledge and could link this to the problems solved during the activities. In contrast to the first focus group session, students in the second session, had a very clear sense of the purpose of the learning approach and were able to relate aspects of the framework to enhancement of their learning.

Delivery and learning approach

After eight weeks or so of the unit, students were given a questionnaire focussing upon their perceptions of the learning experience. This asked students to say how well conveyed the aims and expectations about the sessions were, how they rated the feedback experience, and how actively they participated in class. These themes were considered important as a wealth of research suggests that they are important to foster students with a deep approach to learning.

In order to test whether the change to an activity-based curriculum made any difference to learning perceptions, two student groups were questioned, both of whom took units designed using MHA. However, whilst one was activity-based, the other was predominantly lecture/buzz group based. Each group had the same tutor (here called Tutor A). Secondly, in order to identify whether any difference in response might be a result of personality driven differences, two groups were tested, both of whom taught with an activity-based curriculum. One group was the activity-based group taught by Tutor A, the other an activity-based group taught by a second tutor (Tutor B). The t-test results for the comparisons between these three groups are given in Table 1.

Table 1. T test results for Learning Perceptions Questionnaire data

Test	*t value*	*p>*
Different tutors, ABL as the delivery method	8.078	0.01
Same tutor, different delivery method	1.368	0.01

The table clearly shows that students better perceived the expectations made of them, their participation, and the usefulness of feedback, from the activity-based sessions. Moreover, this result was true, regardless of the tutor. In other words, they suggested that HOW material was being taught was more important than WHO was teaching it. Thus, it might be claimed that an activity based curriculum, following an MHA framework, focuses much more upon what the student does rather than what the teacher does or is (Wright, 2005).

So what made for this change? It was clear from focus group work that the ability to use outcomes gave the students clear direction, and that the activities themselves helped in making connections between often seemingly disparate bits of the curriculum:

Student 3: 'when we walk away from those (sessions) … I do often hear comments that it was a well rounded - it comes to a close nicely. You know first of all it's set out in that you know what your objectives are …'

Student 1: 'Or what your learning outcomes are going to be'

Student 3: 'Yes, and by the end you know that … he will summarise it, he will round everything off and you walk away feeling, because of doing it through a different technique, you have actually learned what he asked you, you know what he set for you to learn at the beginning'

Students also identified that they felt they remembered things better, and had a better recall of facts and ideas when solving problems or answering questions in another context. If this is true, it is pleasing to note that an ability to apply understanding between subject areas is just one characteristic of a deep approach to learning (Ramsden, 2003)

The model and student achievement

Whilst there was a clear sense that activities and feedback helped with summative assessment, some students still failed to achieve. However, in all but one case, students had been talked to either regarding their attendance record, or their participation in or preparation for class. In other words, the active recording process developed through the MHA, helped identify potential 'at risk' students. Moreover, self-assessment grading on session work or course work was, typically, a grade (in the degree scheme classification sense) more than grades given by the tutor. Despite further conversations, this problem was never rectified.

Since students were able to describe the role of outcomes in terms of setting the direction for the sessions and in providing a framework for self-assessment, this was a puzzling finding. Students commented that they were aware of the importance of 'being honest' in making these assessments in order to have a clear view of their participation and on-going achievement. They also linked outcomes and self-recording to having clear goals, which they found motivated and enabled their learning because it was very clear when there was poor participation or the likelihood of not achieving. In other words, in all honesty they believed they were achieving, but were insufficiently adept at judging the extent of that achievement.

This was interpreted as a breaking down of the model. By 'achieving', or passing, all of the outcomes, institutional regulations deem that the student has passed alone, and this expectation was communicated to the student. A discriminating judgement based upon the qualities of the work assessed i.e. the extent beyond which they have demonstrated the outcomes themselves, then gives the final mark. However, it is clear that 'achievement' is also a subjective conception, much rooted in personal expectations of each student.

Initial discussions surrounding what outcomes meant, and what marking criteria might be applied seemed to be successful. However, the constant over-grading by students would suggest that whilst they can identify whether a piece of work exhibits the evidence needed to demonstrate the passing of an outcome, the discriminating judgement (based upon further criteria) is less well formed. When asked to give feedback on peers' work, comments

such as 'well-referenced', 'good use of tables', 'well-structured' were popular. These so called 'hygiene factors' show that students become preoccupied with what work looks like rather than what intellectual qualities it shows. This, therefore, suggests that criteria were not well understood, or that students were unwilling or unable to wield them effectively.

Thus, the model seems useful in helping students to realise their relative levels of participation and engagement. This will help them pass, and thus boost retention, at Level 3, where most students might be focussing less on just passing but more the extent to which they pass. The model is less successful in helping students to get a good idea of how near the 'centre' they might be (if we envisage the centre as a mark of 100%). In order to improve the abilities of students to recognise this, it was clear that both student reflection and tutor facilitation skills needed further attention.

curricula that are active, problem driven, and have a real world focus engage and encourage students in ways that traditional didactic teaching does not

Conclusions and recommendations

The MHA had been previously identified as a way of showing that, within any given session, students could identify for themselves their relative levels of participation and achievement, in order to inform their ongoing development within a unit. Whilst this work had been pioneered in the engineering disciplines, it was clear that there was merit in identifying whether this was success based upon subject specific characteristics, or whether the approach was transferable.

This study has shown that the approach can be used in other disciplines. However, it has identified that whilst in might help tutors in first level courses to identify students potentially 'at risk' through their study habits, the model does not fully allow attending, participating, and even engaging students (often seen more at Level Three), to make robust self-assessment judgements, and thus become truly independent. A refinement of the model could be developed, that concentrates on nurturing better reflective capabilities within these students, so that this process can be truly meaningful.

This study also worked with a different delivery method to that of previous studies (ABL rather than pure PBL). Evaluation data collected at various stages in the unit delivery showed that curricula that are active, problem driven, and have a real world focus engage and encourage students in ways that traditional didactic teaching does not, even when the MHA is applied.

References

Biggs, J. (1999) *Teaching for Quality Learning at University*. SRHE/OUP: Buckingham.

Hutchings, W. and O'Rourke, K (2003). *Problem Based Learning: Evidencing and Evaluating the Student Experience*. The English Subject Centre Mini Project Report [WWW] http://www.english.heacademy.ac.uk/archive /projects/reports/pbl_manchester.doc. Accessed 10/1/06.

Marton, F. and Säljö, R. 1976. On qualitative differences in learning – I: outcomes and process. *British Journal of Educational Psychology*. 46. 4-11.

Prosser, M. and Trigwell, K. (1999). Understanding Teaching and Learning: the Experience in Higher Education. SRHE/OUP: Buckingham.

Ramsden, P. (2003). *Learning to Teach in Higher Education*. 2nd Edition. Routledge Farmer: London.

Robinson, A., Udall, M., (2006) Using formative assessment to improve student learning though reflective practice. In: Bryan, C., Clegg, K., eds. *Innovative Assessment in Higher Education*. Taylor and Francis Group, London.

Robinson, A., Udall, M. (2003) *Developing the Independent Learner: the Mexican Hat Approach*. IEE Engineering Education, IEE.

Robinson, A., Udall, M. (2004) Developing the Independent Learner: The Mexican Hat Approach. Engineering Subject Centre Mini Project Case Study Report. [WWW] http://www.engsc.ac.uk/downloads/resources/independent.pdf

Wright, P. N. (2003) Problems, pollution, and pedagogy - linking teaching and research through a Problem Based Learning exercise. *Planet*. 5. 39-42.

Wright, P.N. (2005) So, what does make good lecturer? *Planet*. 15. 4-7.

Acknowledgements

The author wishes to acknowledge the perseverance of the students of these courses. At an important time in their academic life, they were willing to face something seemingly unfamiliar with good grace and lots of humour. Mark Udall, also Faculty of Technology, SSU, is thanked for discharging the unenviable duty of project evaluator and focus group facilitator with his usual aplomb.

Paul Wright

School of Maritime and Coastal Studies, Faculty of Technology, Southampton Solent University.
Paul.Wright@solent.ac.uk