Exploiting farm tours to provoke exceptional student learning and development

Christopher K Morgan

Faculty of Science and Agriculture, Charles Sturt University, Orange NSW 2800 Australia

cmorgan@csu.edu.au

Abstract. Student tours are planned to be occasions for learning but can easily degenerate into little more than social outings. While tour organisers may take students into career relevant professional contexts, the tour design is often one that allows the student to be a passive spectator rather than an active participant. Irrespective of this, invariably there is likely to be a number of self-motivated students who take a keen interest. However, unless the tour is carefully designed, there will also be students who gain little from the occasion. This paper reports on a design of a three-day tour to farms that engages all the students through challenging them with assessment tasks that must be completed while on the tour. The structure provokes students to work collegially and to build on their prior knowledge through their observations and analyses so that they can derive plans appropriate for the context. A framework that channels them towards self-authorship supports their personal development as learners.

Keywords: agricultural education, farm tours, self-authorship, learning design, student excursions, assessment.

Background

Australian universities have attempted to define the stamp their graduates take with them into the workforce. Lists of generic graduate attributes frequently appear in policy statements and strategic plans (e.g. University of Canberra 2002; University of Wollongong 2003) and increasingly their development is being tracked for individual students as they progress through their course of study (e.g. Murdoch University 2003; the University of Queensland as reported by Stein 2002). There is considerable commonality in the various university statements of their attributes and invariably they include reference to achieving many laudable capabilities such as having the capacity for critical thinking, having acquired high level communication skills and having embraced a global perspective.

This trend towards specifying and mapping the achievement of particular capabilities does not escape criticism. Attempts to capture the aims of the university experience as a set of skills and attributes is seen by some as dangerous as it is claimed that it could distract academics from pursuing the main purposes of higher education (Dearn 2005). This request for caution is based on the thinking that it is preferable to embark upon a more holistic quest, whereas mapping capability development may be regarded as a fragmentation of the university experience.

One holistic goal leading to enduring learning that has been gaining currency is the notion of self-authorship, something described as the capacity of individuals to define their own beliefs, identity and relationship with the world (Baxter Magolda and King 2004). Self-authorship means actively understanding the basis and the limitations of our own knowledge and accepting that knowledge is relative and personal. For students to do this they need to shift from a credo that knowledge is certain and comes from some external authority, such as their lecturer or textbook. Pizzolato (2003) points out that many entering university students see the world in binaries of right or wrong, good or bad, and anticipate being given single right answers. As they progress, there is a transition away from this expectation of sets of single right answers to be accepted uncritically and towards seeing that determining what is right requires analysis of relevant evidence according to the context (Belenky et al. 1997; Chickering and Reisser 1993, King and Kitchener 1994).

As was clearly shown in a study conducted by Baxter Magolda (1992), unfortunately this process of transition provides no guarantee that most students develop contextual ways of knowing by the time of their graduation. When she followed her students beyond their graduation and into the workforce, Baxter Magolda (2001) found a sharp rise in their ability to consider context when interpreting situations. However, she also found that they lacked self-authorship; that is, they did not construct their knowledge through interactions driven by their own perspectives and goals balanced with their understanding of the contextual nature of knowledge. She concluded that universities failed to trigger the necessary development of self-authorship by too readily supplying students with information and answers. Students were not being confronted with sufficiently provocative experiences that disrupted their equilibrium in such a way that they would develop complex, reflective ways of knowing. In a separate study, Pizzolato (2003) highlighted the importance of interactions with others in managing provocative experiences and building self-

authorship, as it is others who guide the establishment of procedural, conceptual and relational schemas associated with their personal goal or task achievement.

The above beckons university educators to devise approaches that will assist the development of self-authorship in students. It suggests employing processes that provoke students to engage with others in critical thinking and knowledge applications. It bids us to immerse our students in challenging experiences from which they can make meaning. As academics our role is not necessarily to provide answers but instead to pose questions that guide our students as they explore ideas and test and refresh their current knowledge through new contexts and experiences. Student excursions are opportunities for employing such active learning designs and the remainder of this paper will report on a case situation where such a learning design was used.

The framework for a farm tour

The author's campus was established over thirty years ago to provide rural business management education to farming and rural industry. While its mission has since broadened, the applied management education focus has endured. An important component of the presentation of courses has been the use of student tours to farms due to the authenticity they bring to the courses. Field trips, including farm tours, bridge the gap between theory and practice (Harper 2004; Watson et al. 1998). Students in the final year of the Bachelor of Farm Management have the option of selecting the subject *Livestock Management*. Earlier these students will have successfully completed other studies in the livestock field providing them with a relevant knowledge base as they enter this higher level subject. Additionally many will also have had farm experience and from that some will have gained a familiarity with livestock systems.

One component of the *Livestock Management* subject is a three day tour where three very large beef cattle properties are visited. This student tour is scheduled for mid-way through the semester and preceded on campus by a preparatory series of lectures and practical classes. Students are given the task of working in groups and devising specific management plans for the livestock enterprises on each of the three properties they visit. These are significant challenges and if they are to be met then the group members have to be incisive with their observations and interrogations and work well together. Conscious of the role that assessment can play in motivating students to participate energetically in group tasks (Isaacs 2002), the tour staff feel it is important to incorporate these tasks into the subject assessment.

The value for students to be asked to work in groups is well documented (e.g. Jacques 1984; Michaelson 1992) and it is not surprising that capabilities arising from this such as interpersonal and teamwork skills commonly appear on university graduate attribute lists and are highly valued by employers seeking graduates (Harvey and Green 1994). The academic staff associated with this particular tour mainly want their students to work in groups so that they can learn from and with each other. They assert that if this is done well then the students will collectively analyse and evaluate the situations they encounter in a more comprehensive manner than might be possible for individuals.

In order to evaluate individual as well as group performance, self and peer assessment by the students is included in the task alongside the assessment conducted by tour staff and cooperating property managers. Besides contributing to avoidance of freeloading, an anticipated benefit of doing this is an expectation that it leads to desirable learning outcomes being achieved that align with self-authorship such as autonomy, judgement and self-awareness. This combination of tutor and self/peer assessment, and possibly independent judges, is generally advocated in the literature on the assessment of group tasks (e.g. Isaacs 2002; Spronken-Smith 2003).

There are normally around thirty students on the tour and they are allocated by staff into groups of six and charged with three tasks, to

- develop their group's proposed livestock management calendar for the property being visited,
- determine appropriate product specifications for the different livestock enterprises on the property, and
- to develop a marketing strategy for those products.

Staff expect the students to develop these items through several avenues including discovering and utilising their group's expertise, from knowledge gained from preparatory class work, through other case studies they have encountered and through their development and learning in earlier livestock subjects studied. However, the major contributors to completing these tasks to a high standard needs to be through their understanding of other related factors about the specific property they glean from farm staff and their visual assessment of the property being examined and its livestock.

This is a construct aimed at developing an appreciation by students that the knowledge they are building needs to be specific for the context they are examining.

The tour design

The tour party travels by bus together and they schedule their arrival at the first property to be investigated late in the day. Following introductions, they share the evening meal then spend about an hour with the farm manager and key farm staff. These are asked to give an overview of the farm business and provide background details such as a brief history of the property, the business structure, and the organisation of staff and their responsibilities, plus broad details of the current livestock enterprises such as the size of the herd. However, where this differs from a more traditional tour design is that it is stressed to these presenters to refrain from giving any details directly related to the three particular contextual tasks that the students have to complete. Similarly, while students have the opportunity to ask questions to help them clarify the business environment, there is a constraint on their questioning. They are instructed that they may not seek details of the current management calendar, product specifications or marketing strategies being used.

Next morning the observational skills of the students are exercised as they assemble on the bus with the tour staff and hosts to tour the property and view its livestock. Typically the stock are in several groups located on different parts of the property either grazing, in a feedlot or in the cattle yards. The students do have the opportunity to quiz the farm staff within the set parameters, but again the hosts are under instruction not to volunteer any information on the livestock being viewed. Instead, the tour leader provokes the students' observational skills with questions related to the tasks they have been given such as "How old do you think those calves are?", "When do you think those cows were joined?", and "What do you estimate is the body weight of those cattle?". At this time the academics and the cooperating farm staff deliberately refrain from making any comment as to the accuracy or otherwise of the responses students made to such questions as the students are expected to reach agreement within their groups on these matters.

Upon completion of the property inspection, the students are given two to three hours to work on their assigned tasks within their groups. The groups are well separated and the academics, in conjunction with the cooperating farm staff, act as itinerant facilitators for all groups. This design challenging students to resolve problems confronted in this way in the field is sympathetic to Schon's (1991) advocacy to replicate conditions that reflect the reality faced by professional practitioners who have to contend with unique problems whereby they need to "think on their feet" using a collection of theories, processes and experiences.

Once a student group indicates that they have completed their work and are ready, they orally present their findings to the academic staff on the tour, the farm manager and cooperating farm staff. Meanwhile the other groups remain apart and continue with their preparations. The students make their own decisions about how they structure their presentation but are expected to share duties among themselves. The general pattern is that they divide the group presentation into different segments, assign each member a particular responsibility, and once each student completes his or her contribution the others provide supplementary commentary. During the presentation, each student is asked at least two individual questions with others in the group invited to add to the reply of the individual respondent. This process is repeated for each of the two subsequent properties visited and the group composition is changed each time.

The process of assessment

Immediately following the group presentation the assessment both of the collective group performance and of the individuals within the group is undertaken. The assessors are the academics and the farm manager as well as the students themselves. The cooperating farm manager's contribution carries equal weighting with that of each of the academics. Pre-determined marking criteria are used. The allocation of marks between various categories has evolved over successive tours with the most recent being 50% of the marks available for the task being allocated by the staff (including the farm manager) to the group, a further 10% by these same assessors to each member of the group based on student responses to questioning and staff observation of how the students were observed working in their groups, and the remaining 40% based on students' peer assessment. In earlier designs there was provision for students to self-assess as well as peer-assess. This has now been abandoned due to the encountering of some students who scored themselves much higher than their peers did and, in the view of the tour staff, well above what they deserved.

When interviewed staff indicated a confidence in their own ability to differentiate adequately which students were contributing to their group and which ones were not. Nevertheless, they also strongly recognised value in having students being assessors as well and cited three reasons. Firstly, they admitted that staff were not privy to the entire workings of the groups and thought the students themselves were ideally placed to make judgement about the relative contributions of the individuals in their group. Secondly, there was a recognition that the staff view would be influenced by the responses to questions they posed to each of the students and that a student giving impressive responses may have been asked the particular questions that suited them whereas other students may have been asked less suited questions. Thirdly, they felt that by giving this responsibility to students it would contribute to their development as managers. As Earl (1986) noted, this is a responsibility that mirrors aspects of the professional environment.

There was no concern expressed by the tour staff about the ability of their students to do the assessing of their peers and this is a view supported by the investigations of Falchikov and Boud (2000) who critically reviewed and documented the success of peer assessment schemes in higher education. Similarly, more recent research by Langan et al. (2005) found that their student assessors awarded marks with fairly high precision when correlated with marks given by academic staff. Some others, however, such as Brown and Knight (1994), express caution and have highlighted conditions that may lead to biased peer assessments. Provision is made for normalisation of results as advocated by Li (2001), but this has not been activated as there has been no apparent evidence of the presence of bias other than that reported for when earlier designs allowed students also to self-assess. The precautions and design utilised in this particular farm tour would appear to have largely nullified opportunities for such biasing conditions to materialise. Furthermore, as Johnston and Miles (2004) found in their own study, the students have taken the peer-assessment process seriously and have demonstrated discernment with their scoring. A contribution to this may have been the confidentiality applied to the peer-assessment process, something that McIlveen et al. (1997) found tended to result in more discriminating marking.

The design utilised here largely employed the guidance and format explained in detail by Healy and Addis (2004) who refined their approach from that presented by Conway et al. (1993). An advantage of their model is that if a student wishes to give a peer a high score then they do not have to take points off others in order to do so. The approach involves students giving individual ratings on a five-point scale to all members of their group other than themselves, against five different areas of contribution to the group performance. Scores are given for each individual's reasoning, analysis, knowledge, leadership and commitment and compared with the group's average score to determine individual weighting factors. These weightings are then applied to the group mark to produce each student's peer-reviewed mark. Clearly, if a student wishes to score well then it would be necessary to be an active participant in the group processes. Unlike some other forms of assessment (Alam 2004; Marsden et al. 2005), it would be difficult for a student with a low learning orientation to score well through heavy reliance on others. This design also is one where it is in every student's interest for their particular group to score well and it overcomes a criticism of category-based peer-assessment made by Lejk and Wyvill (2001) when individual marks are calculated on a 'zero-sum' basis leading to competition within the group.

Conclusions

The approach that has evolved with this tour is well supported through the literature. It involves engaging students actively in their learning (e.g. Brockbank and McGill 2003; Marquardt 2004), it has a strong process orientation involving the nurturing and improvement of student communication, observation and enquiry skills (e.g. Athman and Monroe 2002), it gives students leadership opportunities and the challenges of managing group situations and taking responsibility for others (Gold et al. 1991, Watson et al. 1994), it involves intense group discussions intended to lead to a greater depth of understanding of the issues and independence as students need to learn from each other and not be cognitively dependent on their lecturer (Kremer and McGuiness 1998), it demands students utilise effective communication and teamwork skills to generate logical, creative ideas and exhibit a capacity to apply their learning (Duch et al. 1998; Kremer and McGuiness 1998; McIlveen et al. 1997), and it requires students to pursue, collect, analyse, synthesise and evaluate information, a process consistent with the building of the above higher order skills (Campbell and Piccinin 1999; McKinney 1998).

This has been a novel learning design for all the participating students as their other excursions are structured very differently. It is not surprising then that on the first tour when it was used there was a tendency for students to be bewildered, anxious and to not reach the standards expected. Subsequently it was determined that the first farm visited on the tour would be a 'trial run' with all processes in the design followed but the assessment scores would not be applied. This proved successful from a learning perspective with the students then using the first activity as an

opportunity to become familiar with the process and expectations and to identify and correct areas of weakness. They reported an appreciation that this formative development opportunity enabled them to be better prepared for the subsequent farm visits where their summative assessment scores would be applied. The category-based nature of the peer-assessment component helps with this formative development.

When researching for this paper, the cooperating farm manager for the property where the trial run was conducted was asked for his viewpoint. He responded:

> "*I think it is good. If [their assessment] was based only on what they did today they would have failed. Today has helped them get their minds around what is required; they learn from this initial experience what they need to extract from the manager. In my case there were things I was about to say but pulled myself up as I realised they should have asked a particular question. There were then a lot of things they didn't find out because they didn't ask those questions. Afterwards we gave them feedback pointing this out so hopefully they will be better when they go to their next property. For example, they said they would sell their steers at 16 months of age but I have a contract to supply steers that are no more than 12 months of age. They didn't ask me whether or not I had any such obligations.*"

Like any student excursion, tours to farms can be occasions where students look and listen and not necessarily enquire and analyse. Students invariably return from excursions reporting that they have learned a great deal, but what is it have they learned? How well have they constructed meaning from the authentic context they have experienced?

The design of the farm tour reported in this paper effectively demands a high level of participation from all the students. As Mossa (1995) found, motivating students to participate actively in field excursions leads to outcomes such as the acquisition of self-esteem, something we associate with self-authorship. This tour design, which includes providing feedback while they are on the tour, has been effective in provoking students to contribute conscientiously to their group output. Perhaps more importantly, its focus on demanding students to be self-reliant and link their observations with their prior learning, to probe industry cooperators purposefully, and to work productively under pressure with their colleagues to analyse the situation and solve problems all intertwine holistically to build self-authorship. The students appear to emerge from the tour with enhanced confidence and with a valuable foundation for lifelong learning practices.

Acknowledgement

The author acknowledges the invaluable contribution of Rod Cox who led the farm tour discussed in this paper.

References

Alam LS 2004, 'Is plagiarism more prevalent in some form of assessment than others?', in R Atkinson, C McBeath, D Jonas-Dwyer and R Phillips (eds.), *Beyond the comfort zone: Proceedings of the 21st ASCILITE Conference* , Perth, pp 48-57. Available online at: http://www.ascilite.org.au/conferences/perth04/procs/alam.html (accessed 7 April 2005).

Athman J and Monroe MC 2002, *Enhancing natural resource programs with field trips*, FOR 105. School of Forest Resources and Conservation, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida.

Baxter Magolda MB 1992, *Knowing and reasoning in college: gender-related patterns in students intellectual development*, Jossey-Bass, San Francisco.

Baxter Magolda MB 2001, *Making their own way: narratives for transforming higher education to promote self-authorship*, Stylus Publishing, Sterling, Virginia.

Baxter Magolda MB and King, PM (eds.) 2004, *Learning partnerships: theory and models of practice to educate for self-authorship*, Stylus Publishing, Sterling, Virginia.

Belenky MR, Clinchy BM, Goldberger NR and Tarule JM 1997, *Women's ways of knowing*, Basic Books, New York.

Brockbank A and McGill I 2003, *Action learning handbook: powerful techniques for education, training and professional development,* RoutledgeFalmer, London.

Brown S and Knight P 1994, *Assessing learners in higher education*, Kogan Page, London.

Campbell E and Piccinin S 1999, 'Active learning', *Teaching Options*, Teaching Technologies, Center for University Teaching, University of Ottawa, 3 (1). Available online at: http://www.uottawa.ca/academic/cut/options/Feb_99/FieldTrip_en.htm (accessed 22 Aug 2005).

Conway R, Kember D, Sivah A and Wu M 1993, 'Peer assessment of an individual's contribution to a group project', *Assessment and Evaluation in Higher Education,* 18(1): 45-56.

Chickering AW and Reisser L 1993, *Education and identity*, 2nd edn, Jossey-Bass, San Francisco.

Dearn J 2005, 'Learning as self-authorship', *Monitor Online*, University of Canberra, Australia. Available online at: http://www.canberra.edu.au/monitor/reports/dearn_March%207_05.htm (accessed 14 July 2005).

Duch BJ, Allen DE and White HB 1998, 'Problem-based learning: preparing students to succeed in the 21st century', *The Catalyst*, Center for Advancement of Teaching, Illinois State University. Available online at http://www.cat.ilstu.edu/publications/catalyst.shtml (accessed 11 March 2005).

Earl SE 1986, 'Staff and peer-assessment: measuring an individual's contribution to group performance', *Assessment and Evaluation in Higher Education*, 11(1): 60-69.

Falchikov N and Goldfinch, J 2000, 'Student peer assessment in higher education: a meta-analysis comparing peer and teacher marks', *Review of Educational Research*, 70: 287-322.

Gold GR. Jenkins A, Lee R, Monk J, Riley J, Shepherd I and Unwin D 1991, 'Fieldwork', *Teaching geography in higher education: a manual of good practice,* Geography Discipline Network. Available online at: http://www2.glos.ac.uk/gdn/gold/ch3.htm (accessed 11August 2005).

Harper R 2004, 'The use of group work and presentations on field trips to facilitate active learning experience', in M Healey & J Roberts (eds.) *Engaging students in active learning: case studies in geography, environment and related disciplines*, School of Environment, University of Gloucestershire.

Harvey L and Green D 1994, *Employer satisfaction*, University of Central England, Birmingham.

Healey M and Addis M 2004, 'Use of peer and self-assessment to distribute group marks among individual team members: ten years' experience', in M Healey and J Roberts (eds.) *Engaging students in active learning: case studies in geography, environment and related disciplines*, School of Environment, University of Gloucestershire.

Isaacs G 2002, 'Assessing group tasks', *Teaching & Learning in Higher Education Series*, Teaching & Educational Development Institute, The University of Queensland.

Jacques D 1984, *Learning in groups*, Croom Helm, London.

Johnston L and Miles L 2004, 'Assessing contributions to group assignments', *Assessment and Evaluation in Higher Education*, 29(6): 751-768.

Kremer J and McGuinness C 1998, 'Cutting the cord: student-led discussion groups in higher education', *Education & Training*, 40(2): 44-49.

King PM and Kitchener KS 1994, *Developing reflective judgement,* Jossey-Bass, San Francisco.

Langan AM, Wheater CP, Shaw, EM, Haines, BJ, Cullen, WR, Boyle, JC, Penney, D, Oldekop, JA, Ashcroft, C, Lockey, L and Preziosi, RF 2005, 'Peer assessment of oral presentations: effects of student gender, university affiliation and participation in the development of assessment criteria', *Assessment & Evaluation in Higher Education*, 30(1): 21-34.

Lejk M and Wyvill M 2001, 'Peer assessment of contributions to a group project: a comparison of holistic and category-based approaches', *Assessment and Evaluation in Higher Education*, 26(1): 61-72.

Li LKY 2001, 'Some refinements on peer assessment of group projects', *Assessment and Evaluation in Higher Education*, 26(1): 5-18.

McIlveen H, Greenan K and Humphreys P 1997, 'Involving students in teaching and learning: a necessary evil?', *Quality Assurance in Education*, 5(4): 231-238.

McKinney K 1998, 'Engaging students through active learning', *The Catalyst*, Center for Advancement of Teaching, Illinois State University. Available online at: http://www.cat.ilstu.edu/publications/catalyst.shtml (accessed 11 March 2005).

Marquardt MJ 2004, *Optimising the power of action learning: solving problems and building leaders in real time*, Davies-Black Publishing, Palo Alto, California.

Marsden H, Carroll M and Neill J 2005, 'Who cheats at university? A self-report study of dishonest academic behaviours in a sample of Australian university students', *Australian Journal of Psychology*, 7(1): 1-10.

Michaelsen LK 1992, 'Team learning: a comprehensive approach for harnessing the power of small groups in higher education', *To Improve the Academy*, 11: 107-122.

Mossa J 1995, 'Participatory student field guides and excursions', *Journal of Geography in Higher Education*, 19(1): 83-90.

Murdoch University 2003, Mapping the graduate attributes, *Graduate attributes*, Teaching and Learning Centre, Murdoch University, Australia. Available online at: http://www.tlc.murdoch.edu.au/gradatt/mapping.html (accessed 18 June 2005).

Pizzolato JE 2003, 'Developing self-authorship: exploring the experiences of high-risk college students', *Journal of College Student Development*, 44(6): 797-813.

Schön DA 1991 *The reflective turn: case studies in and on educational practice*, Teachers Press Columbia University, New York.

Spronken-Smith R 2003, 'Implementing a problem-based learning approach to teaching research methods in geography', paper presented at Higher Education & Research & Development Society of Australasia Conference, Auckland.

Stein S 2002, 'Mapping and embedding graduate attributes: a timeline for 2002', *Teaching and Education News*, The University of Queensland, 12(1). Available online at: http://www.tedi.uq.edu.au/TEN/TEN12-1/ten1_stein.html (accessed 18 June 2005).

University of Canberra 2002, Generic skills and attributes of University of Canberra graduates from undergraduate and postgraduate coursework courses, University of Canberra, Australia. Available online at: http://wasp.canberra.edu.au/secretariat/council/generic.html (accessed 18 June 2005).

University of Wollongong 2003, Attributes of a UOW graduate, University of Wollongong, Australia. Available online at: http://www.uow.edu.au/about/teaching/graduate_attributes.html (accessed 18 June 2005).

Watson P, Dawes LA, Mathieson W and Shanableh A 1998, 'Putting environmental engineering into perspective: a field study', in P Howard, G Swarbrick and A Churches (eds.), *Waves of change*, Proceedings of the 10th Australasian Conference on Engineering Education, James Goldston Faculty of Engineering and Physical Systems, Central Queensland University, Rockhampton, Australia, pp. 179-183.