

Developing academic persistence in first year tertiary students: A case study

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Abstract

Teachers and researchers of undergraduate university students agree that the first year experience can have a major impact on later study participation and academic performance. Specifically, the transition to university study from school or other contexts requires that first year students demonstrate the characteristics of self-directed learners, as they enter an environment with minimal constraints and an expectation of self-motivation and individual effort. Art Costa (1991) identified several such characteristics that he terms habits of mind, suggesting that demonstration of these habits will enhance the academic success of learners. The aim of this research project was to identify teaching and learning strategies that have the potential to assist first year university students to persist at a task. Persistence is one of Costa's habits, and is related to one of the Seven Principles of Good Practice in Undergraduate Education, recently adopted by Central Queensland University in the pursuit of enhanced teaching and learning outcomes for staff and students alike. This paper outlines the data gathered from a tutor of first year undergraduate teacher education students enrolled in a Queensland regional campus. The data presented here were gathered through a participant journal and an individual interview at the end of the term. Analysis of the data revealed that student persistence can be developed and enhanced through the use of teaching and learning strategies with a focus on explicit teacher talk, reflection on learning, shared experiences and positive feedback.

Introduction

The contemporary first year undergraduate student population represents a more diverse group than ever before. "No longer are our first year students young, single, financially unburdened and fresh-faced, but rather they are a diverse range of individuals bringing with them maturity and a multitude of life experiences" (Cushman, 2004, p. 1). Similarly, McInnis, James, and Hartley (2000) report that current Australian universities consist of equal proportions of school-leavers and mature-aged students and that "it appears that university study occupies a smaller proportion of a growing number of students' lives." Wilson (2003) argues further that the university demographic of students with upper socio-economic backgrounds and strong family support has been replaced by a system of "mass" higher education with a very high level of diversity in the student body. The Department of Education, Science and Training (2005, p. v) reports that students spend fewer days on campus and their hours in class have reduced from 17.6 hours per week in 1994 to 15.9 hours per week in 2004. Over the same period, there has been a significant rise in the proportion of full time students committed to paid employment (from 47% to 55%). James (2008) updates this further, reporting that in 2007, 1 in 8 students indicate they regularly go without food or other necessities because they cannot afford them. Furthermore, more students are reporting missing classes in order to work, and 70.6% of full time undergraduates were working on average 14.8 hours per week during semester. Horstmanshoft and Zimitat (2003) also suggest that in addition to increasing levels of paid employment, the typical Australian university student is likely to have family and parenting responsibilities.

Research suggests that another explanation for the poor performance of students in the initial year of their degree program is their inability to adjust to the less structured environment that university education offers. Flinders University (2007) notes that many new students fail to understand the depth of preparation that is required for participation at the university level, and are easily distracted from their studies. This is a belief echoed by Cushman (2004, p. 2) who contends “Learning to manage time in a less regulated learning environment provides a major challenge for many young people.” For a significant proportion of these beginning university students, the issue is underpinned by an inability to manage their time.

Further research reveals that university students are reporting increasing levels of stress and anxiety as they attempt to complete an undergraduate degree (Lahmers & Zulauf, 2000). Flinders University (2007, p. 1) maintains that emotionally, students are experiencing significant stress levels and that “More students are taking part-time employment during college, while their commitment to school work appears to be diminished.”

With this combination of factors, it is little wonder that the dropout and failure rate of Australian University students has reached significant proportions. Hillman’s (2005) research suggests that the first year is the most potentially ‘risky’ time for undergraduate students to withdraw from or defer their studies. McInnis, James, and Hartley (2000) report that a considerable number of these students have a very uncertain start at university leaving them at risk of dropping out. They maintain that “This is generally through a combination of factors which can include lack of accurate initial information, poor course choices, failure to get their first choice, or unrealistic expectations of the amount of work and time involved in university study” (p. xi). Similarly, Wilson (2003) maintains that attrition rates for first year university students are much greater than for those in other year levels.

Given that the cited research supports the notion that first year students are at risk of experiencing an inability to cope with university demands, it is of concern that there exists compelling evidence that positive results in the first year are an indication of future university success. The first year experience at university is recognised as especially important as this is when the majority of student departures occur, and it is the key to many student experiences that lead to later success in higher education (McInnis, 2001). Similarly, the Department of Education, Science and Training (2005, p. 31) reports that “Students’ engagement with learning and the learning community is now internationally recognised as a prominent indicator of the nature and quality of the first year student experience.” If successful in their first year, students are more likely to continue their positive engagement in higher education.

How are Universities to address these issues? Central Queensland University has responded by seeking to strengthen the teaching capabilities of all teaching personnel, through the adoption of a revised Management Plan for Teaching and Learning. This includes a focus on the following Seven Principles of Good Practice in Undergraduate Education:

1. Encourages contact between students and faculty;
2. Develops reciprocity and cooperation among students;
3. Uses active learning techniques;
4. Gives prompt feedback;
5. Emphasises time on task;
6. Communicates high expectations;
7. Respects diverse talents and ways of learning. (Chickering & Gamson, 1987, p.2)

These principles have become widely adopted in the USA, and evidence from research suggests that these principles have a positive effect on student learning across a range of disciplines. Bradford and Peck (1997) report the effectiveness of the principles when applied to undergraduate accounting classes, and Koeckeritz, Malkiewicz, and Henderson (2002) outline how the principles can be successfully utilised within nursing education. Page and Mukherjee (1999) applied these principles to both management science and business programs. Recent research shows that these principles also apply to online courses (Batts, Colaric, & McFadden, 2006; Graham, Cagiltay, Lim, Craner, & Duffy, 2001).

Chickering and Gamson (1987) recognise that *deep learning* is more likely for those students who use their time effectively, and that this learning tool should be taught and modelled by the teacher. Effective teachers will therefore ensure that learning tasks are well designed, with thorough student preparation and adequate time allocation. For teachers of first year undergraduate students, it is particularly important to encourage realistic and efficient time on task, so that this *habit* can be utilised throughout their entire degree, and indeed, into their future professional lives. So for this research project, given the previously cited research concerning the competing demands on student time, we chose to adopt the fifth principle from Chickering and Gamson of *emphasising time on task*, as our focus. This relates well to Costa and Kallick's (2000) intellectual habit of *persistence* in that those students who are able to persist at a task will be spending effective time on that task. Persistence at a task requires an analysis of the problem, the development of a system, structure or strategy to approach and solve the problem, and a repertoire of alternative strategies for problem solving.

Costa and Kallick (2000) contend that although some of the habits of mind may be evident in some learners, it is desirable for teachers to introduce and develop the habits in an explicit way, to enhance the capabilities of each student. Marzano and Pickering (1997) also recommend that the habits need to be defined, explained, discussed and rewarded to develop student understanding. Once such an understanding is achieved, teachers should then employ a range of strategies that "overtly and intentionally" (p. 264) assist students to develop the productive habits of mind that will enhance learning outcomes. Strategies recommended by these researchers include:

- Help students understand the habits of mind;
- Help students identify and develop strategies related to the habits of mind;
- Create a culture in the classroom and the school that encourages the development and use of the habits of mind;
- Provide positive reinforcement to students who exhibit the habits of mind.

(Marzano & Pickering, 1997, pp. 264–269)

Wiggins (2008) agrees on the importance of positive reinforcement, but places less emphasis on explicitly teaching about the habit and more on providing multiple opportunities to develop it. You don't develop a habit by direct instruction or informing students of the value of the habit, and you don't develop a habit by having it merely demanded of you ... To talk of better habits is to talk about something becoming "second" nature. It depends upon incentives, reinforcement, modelling. It means that you have to recognize when the old habit is acting, when to try a new habit, and practice in using the new habit and seeing its value. That takes time, repetition, situations which reward the new habit; and it takes wise, savvy, tactful teaching. (Wiggins, 2008, p. 1)

Methodology

Merriam (1998) argues that effective qualitative research investigates elements of lived experience through an examination of the “participant perspective.” Such research seeks to illuminate understanding, meaning or description of a given phenomenon, and may be conducted in a variety of ways including case study. We chose to use the case study approach due to its ability to “gather an in-depth understanding of the situation and meaning for those involved” (Merriam, 1998, p. 19). Merriam further explains that a case study is particularly appropriate when examining ‘bounded systems’ such as our teacher education program, as it is able to “fence in” (1998, p. 27) the particular case that is of interest.

The focus is on one tutor’s attempts to incorporate the desired pedagogic practices into her teaching. In this context, the case study is consistent with the thinking of Golby (1989, p. 168), when he says “It is not asserted here that case study is the name of a single method or coherent set of methods of research. It is seen instead as a focus for enquiry; the case is the subject for enquiry.” There is no intent to generalise the results to a population of teachers; however, it would be hoped that others would agree with Stenhouse (1985, p. 12) who contends “vigorous forms of case study inquiry have the potential to provide illuminating and fruitful insights into classroom based teaching and learning that offer teachers and other researchers a sound basis for making professional decisions and judgements.” Here the case study serves as an exemplar of good practice.

It is also a particularly appropriate methodology for the research presented here, as the case study has the potential to examine fully one specific aspect of education practice at an identified point in time. Merriam (1998, p. 33) agrees, recommending that “case study is a particularly suitable design if you are interested in a process” such as the process of teaching investigated here, as it provides immediate feedback on an implemented element of a program.

The participant in this study is a tutor within the first year Bachelor of Learning Management (BLM) program at a regional Central Queensland University campus. The induction to the project began with a briefing session, outlining the research plan and specifically, the part she would play. The session also covered the Seven Principles of Good Practice in Undergraduate Education and the Habits of Mind that underpin the project. She was provided with background information about the theoretical aspects and practical application of the *principles* and *habits*, and exposed to teaching and learning strategies that specifically support the principle of “time on task” and the habit of “persistence.” She was advised that the research project would span the whole of Term 1 (from March – June 2007), and was directed to design her tutorial activities to include a selection of teaching and learning strategies that might enhance the students’ capacity to persist at a given task or activity. She was provided with a research journal and asked to make a note of the teaching and learning strategies utilised throughout the term and the effect, if any, of such strategies on student performance. Lankshear and Knobel (2004, p. 250) refer to this data collection resource as a *participant journal* and explain that “participants are asked to write these journals in order to record their personal insights into and reflections on an event, practice, concept, phenomenon.”

As such, this research sought to use the journal to collect the immediate thoughts and observations of the participating tutor as she implemented a range of teaching strategies over the term. As Lankshear and Knobel (2004) recommend, care was taken to stress to her that the journal should not be burdensome to compile, and would be used primarily as a tool to record events for later reflection.

The data in the journal would be complemented by an individual interview at the conclusion of the term, where she could elaborate upon the brief notes included in the journal.

Lankshear and Knobel (2004) recommend the individual interview as an effective means to gain an 'insiders perspective' of any given research situation. Based on this assumption, the study utilised a one-to-one interview as a secondary means of data collection. Other exponents of the interview are Ramsden and Dodds (1989) who believe that this method of data collection is very effective in an educational setting. They maintain that the interview context enables the researcher to explain fully the purpose of the research and to ask open-ended questions that seek rich, descriptive responses. The interview has the added advantage of allowing the researcher to check continually for understanding. Once this shared reference has been established, it may then be negotiated throughout the interview. This enables the maintenance of a common focus between the researcher and the research participant, by engaging participants in a process of reflection on the specified research interest (Gonzalez, 2001; Kvale, 1996).

The interview conducted as part of this research project employed the semi-structured interview format where pre-prepared questions were used as a guide only, in order to elicit the rich, descriptive data that is important in qualitative research. Heyl (2001) also recommends the semi-structured format to promote elaboration of emergent themes in the interview, rather than tying interviewer and interviewee to a fixed schedule that may limit opportunities to enrich spoken data and gain insights into how interviewees 'see' and understand the world.

The three pre-prepared questions were:

- Can you provide examples of the learning and teaching strategies that you utilised this term with first year undergraduate students?
- Do you believe that these strategies assisted students in any way, to enhance their time on task? That is, their ability to persist at a problem using a range of strategies to assist them to get to the end point or solve the problem.
- What evidence do you have to support this belief?

During the interview, the tutor was encouraged to elaborate upon her responses to these questions, so that a full 'picture' of the case could be established. To enhance the collection of valid and reliable data, we employed transparent and unambiguous questions and permitted the tutor to elaborate as desired. Trustworthiness was also sought through the use of two data gathering techniques, thus maximising the chance that interviewee was 'saying what the researchers thought they were saying' (Merriam, 1998). Having discussed the manner in which data was collected, the following section will explain the ensuing process of data analysis.

Data Analysis

Merriam (1998, p. 193) argues that "conveying an understanding of the case is the paramount consideration in analysing the data." She maintains that this can only be achieved through an examination of first-hand, personal accounts of the ways in which humans experience the world. In outlining an understanding of the case represented in the research presented here, data analysis was viewed as the "process of organising the pieces of information, systematically identifying their key features or relationships (themes, concepts, beliefs etc) and interpreting them" (Lankshear & Knobel, 2004, p. 266).

To begin the process, interview tapes were transcribed verbatim and the participant journal collected and reviewed. On the advice of Lankshear and Knobel (2004), categorical analysis then began with the systematic organisation of the data into groupings that were alike, similar or homogeneous. This was achieved through the iterative process of reading and re-reading the transcript and journal in order to identify potential relationships between data items, in this case teaching and learning strategies that might enhance a student's ability to persist at a task.

The data

For clarity, in this and the discussion sections, direct quotes from either the tutor's participant journal or the interview are indicated by use of *italic font*. First, we will highlight how the tutor approached the development of a teaching program that addressed the project's aims. Second, the data include some specific student tasks and the responses made by the students to demonstrate some of the outcomes of the teaching program.

The tutor approached her participation in the study project in a systematic manner. She conveyed that she did not change her usual teaching methodology, but was careful to enhance her pedagogical planning with a backdrop that considered the principles for good practice in undergraduate education with a focus on the development of student persistence. From her journal it was clear that she included explicit and focused attention to practices including:

- *Defining the habit of persistence;*
- *Explaining it;*
- *Discussing it by relating it to my own ability to do that, the personal anecdote; and*
- *Rewarding it (persistence) by setting a high expectation for competency.*

Each of these strategies is recommended by Marzano and Pickering (1997) to assist students to develop productive habits of mind. They encourage the provision of "time to label, define and talk about each habit so that they (students) can associate the habits with specific behaviour" (p. 264). This tutor achieved this recommendation through an explicit in-class discussion about the habit of persistence, what it was and why it was important to studying at any level of education. Students were made aware of the ability of persistent people to use a variety of strategies to solve a problem, and to return to the problem with different strategies if initial attempts were unsuccessful.

The tutor was also very specific in her selection of the teaching strategies required to introduce, teach, consolidate and assess the content of the course she taught during the term. Specifically, for adult learners she believes that quality teaching involves:

- *providing a clear evidence and practice-based rationale for the learning. so they understand there is a point to what they are learning and that is evidence-based*
- *to make this learning relevant to their current and future lives;*
- *to have fun*
- *to get to know each other and support each other in our learning*
- *to provide accurate, prompt feedback. this course was good for that because any time they did any formal or informal assessment item, they actually got feedback no longer than a week later. they got formal feedback as well and the feedback also has to suggest ways to improve, not just what you did wrong*
- *use of a range of modes and methods of grouping*

- *as many opportunities to practise using the concepts within the time allowed, and so on.*

There were three key tasks that are particularly relevant to this case study. These tasks, the students' responses to them and the tutor's comments regarding these responses are summarised in Table 1, and detailed student responses to the third task are shown in Table 2.

Table 1: Key student tasks, student responses and case study tutor comments regarding these responses

TASK	How the students responded	What the case study tutor thought of the responses
To achieve high levels (80%+) of competency in written English	30 students (50% of the student group) voluntarily attended one-hour small-group sessions with a Communications Learning Centre tutor, and most weeks, about 10 students also sought private sessions with that tutor. Prior to the final assessment, double sessions were run and attended by the majority of students. Students were very positive and enthusiastic about this tutor and this opportunity in support of their studies.	The tutor was delighted (and also somewhat surprised) that so many students had availed themselves of this opportunity. She felt it was evidence of their initial commitment to their study, the value of setting high expectations and their development of the habit of persistence as the numbers did not drop off through the term, but increased towards the end.
Written reflection of the course and their learning	Everybody submitted it in his or her folio despite the fact that it was not worth a specific mark.	The tutor was pleased that all had completed the reflection and was then able to utilise this in class strategies to discuss persistence.
Contribute strategies they had used to persist and solve problems.	Students enthusiastically listed a variety of strategies on large paper sheets that were shared as a class.	The tutor was able to compare these strategies with 5 examples of behaviour that effective people use according to Marzano and Pickering (1997). She found that the students' strategies fitted perfectly into these 5 categories (see Table 2). This reinforced her belief that her teaching had in fact, encouraged the development of persistence in her students.

Table 2: Detailed student responses to task 3 and the tutor's comments

NB: In this table, the column headers are summarised statements of Marzano and Pickering's (1997) five categories.

Break a difficult task into a set of small goals, tackle one at a time and reward yourself after each one	Identify what is contributing to failure and find alternative ways to accomplish the task	Identify people supportive to persistence rather than those who say "give up"	Keep in mind a clear picture of solving the problem, visualise success	When you feel burned out, take a break, which is when breakthroughs often occur
Time management	Read and re-read	Try to study at Uni rather than at home	Have a determination to pass	Prioritise family commitments, actually give some time to your family
Getting bookwork and notes organised	Write and re-write	Go and talk to my tutors (the case study tutor and the CLC tutor)	Feel a sense of achievement	Take time to think
Setting goals and writing them down	Use the look, come, say, write, check spelling strategy for learning spelling words	Check with other students	Never give up	Attempt a problem when I'm not so tired, maybe the next morning
Staying focused	Say it repetitively	Email my tutor	Keep motivated	
Organising myself better	Use multiple texts and resources	Buddy tests	If at first you don't succeed, try again	
Tidying desk and study area	Use Grammar at a Glance (a CLC resource on the web)	My friends and my family encourage me to persist	Make sacrifices	
Get the children fed so I can study	Practise, practise, practise	Bounce ideas off others	Believe you will get it eventually	
Come to tuts	Go to the extra English classes		Have a motivation to pass (even if it's only that you don't want to re-sit the exams!)	
Draw up a study timetable	Look at it again and again		Try to reach for a higher level	
Complete all the practice tasks				
TUTOR'S COMMENTS: <i>I was pleased with the level of response, though had to tease out the responses in column 2 a bit. Just re-doing the same thing isn't necessarily going to lead to any more success. Finding alternative ways to accomplish the task isn't a strong point for these students. I thought it was telling that there were only 3 responses for the last example, I think that says something about the pressure, they actually don't see that they have time to step away, or they don't realise this is an important strategy for persisting, to take some time.</i>				

Discussion

From the analysis of the raw data obtained from the tutor's journal and interview, four key themes were extracted concerning activities and approaches that were seen to enhance the habit of mind of persistence in students. Obviously, these themes are inter-related and were expressed in conjunction with each other.

Explicit teacher talk about persistence

After a few weeks, once she knew the students and felt they had now experienced enough of the course to be receptive to the ideas, the tutor engaged them in an explicit in-class discussion about the habit of persistence. This included what it was and why it was important to studying at any level of education. Students were made aware of the ability of persistent people to use a variety of strategies to solve a problem, and to return to the problem with different strategies if initial attempts were unsuccessful.

She continued to refer to it at appropriate times throughout the term. She was careful to engage students in individual, small group and whole group discussion that she facilitated carefully. She was precise in her efforts to engage her students with the habit of persistence, and how demonstration of the habit could enhance learning outcomes. She also gave them a short article to read about persistence. That the students were actively engaging with this information is evidenced by a spontaneous direct question from a student about how, as future teachers, the students themselves could teach these habits. The tutor responded:

Explicitly! Defining them (habits) for a start, explaining what they mean, discussing how people use them in real life, and also I said, by using some examples from children's literature. You know – the little engine that could and that sort of thing.

Although Wiggins (2008) downplays its importance, other academics such as Marzano and Pickering (1997) believe that explicit teacher talk about desired habits of mind is a necessary step in encouraging the development and use of such habits by the students.

Reflection

When asked what she believed to be the most effective strategy for developing persistence in her students, the tutor was emphatic in her response.

I feel that the most important strategy for developing perseverance, is reflection for teachers, for student teachers and for us (tutors). So I made sure that the students understood that throughout the term you will be reflecting on your learning.

This tutor established the habit at the commencement of the term through explicit teacher talk relating to the notion that constant reflection of one's performance enables analysis of possible areas of concern, and the consequent generation of strategies for improvement.

So all the way through the discussions, I sort of concluded each of those by stressing that reflecting on one's professional practice is a powerful demonstration of perseverance. So just kept coming back to doing reflecting.

One of the strategies utilised to highlight the importance of persistence was a reflective writing task conducted towards the end of the term, where students were asked to respond to the following questions:

- What level of competence in personal literacy did you bring to your study of this course, and how have you been able to use this prior knowledge?

- How have you learned most effectively? What has worked so far to maximise your learning?
- What level of competence do you feel you are at now? What do you feel you may need in order to achieve a higher level of literacy?

Everybody submitted it, then the next week in tutes, in small groups they swapped each other's written reflections and read them. They each read maybe 3 or 4 other students' reflections and then as a whole class we discussed the habits of mind in general. Then we focused on persisting and we talked about that.

Shared experiences

Following the discussion of students' reflections, the tutor provided a written document about the particular habit of persistence before asking students to respond to the following questions:

- What problems did you have in understanding and applying the concepts of the course? How did these affect your ability to study?
- What strategies helped you to persist in order to solve these problems?

Students then shared their responses, brainstorming them onto large pieces of paper that were displayed around the classroom. This strategy conformed to one supplied by Marzano and Pickering (1997) who recommended the sharing of personal examples of persistence to facilitate discussion of the habit. As a result of participation in this strategy, students were able to share the ways in which they approached persistence in the course. Table 2 shows the results of this brainstorm.

The students independently generated strategies that fitted the five categories of behaviours as quoted by Marzano and Pickering (1997) as being those of effective people. In this context, to be effective definitely requires persistence. The tutor was impressed that there was such a good fit, and cited this as evidence that her teaching had actually contributed to the understanding and development of persistence in her students. The research team agreed that this is strong evidence that the students are now aware of persistence, recognise its importance and have developed some strategies towards that habit of mind. However, there are some aspects, notably the capacity to seek alternative methods when one is not working, where the students need further practise and development. The data also appeared to support research previously mentioned that contends that students are under pressure, as the idea of taking a break did not resonate with them. It was telling that none suggested simple activities such as going for a walk, playing music, playing sport, or engaging in a hobby as a means of giving their brains a break from wrestling with a study problem.

Positive feedback

Another strategy utilised and identified by the tutor was the consistent use of feedback on student performance. She stated that it was her intention to provide regular, positive reinforcement to students who demonstrated the habit of persistence.

I deliberately filtered it (feedback): I made the feedback deliberately positive. Even though there's a learning opportunity here for them, and I actually corrected grammatical problems, every time I did, I did a little comment beside in a positive

tone. The reason I made all that feedback positive was that I wanted to affirm to them the immediate benefits of reflecting.

Specifically, feedback to the group on the overall quality of the portfolios included:

- their folios were really well organised and some were outstandingly so;
- their spelling general formats were great and a good resource for classroom teaching;
- their reflections were insightful overall;
- their feedback on the tut activities was really helpful;
- I enjoyed reading about the shock they had experienced (the pre-test) and that it had generated some effective writing; and
- thank you for sharing your likes and dislikes.

The strategy of providing positive feedback to persistent learners is another technique recommended by Marzano and Pickering (1997) and by Wiggins (2008).

Conclusion

This tutor's impression of the importance of demonstrating persistence, and her understanding of how the habit may be fostered, is best summarised in her final comments:

I actually believe that first year university students can be helped to develop the characteristics of self-directed learners, which is one aspect of reflecting. I think if we actually focus on using the sort of things they like, the range of teaching methods and strategies, attitudes and so on. I also think focusing on my own teaching practices models this to students, models the importance of being reflective and hopefully that should enhance their own learning. Any time I planned anything, I used this idea of persisting as a backdrop to the decision-making. So when I was planning face to face sessions, selecting activities, organising resources, explaining things, I did so in terms of supporting their ability to maximise their own time and increase their understanding of the content.

Furthermore, on the value of focusing on persistence in this research:

I think you're right as a team to focus on this habit of mind of persevering ... because it's so important for first year students. It's the first thing to go when they're stressed out. When you're short of time, the first thing to go is persisting, you don't want to spend any longer on it, and so it's probably the hardest habit of mind to develop and demonstrate. But it's probably the thing that once they are managing their time well, if they ever get to that stage, then they are going to see immediate benefits if they have the habit of mind of persisting. So probably the key information for you is all the things they wrote down in that discussion, all the strategies they've been developing over the term that helped them to persist to solve the problems they've had in their study.

From an analysis of the data supplied in this case study, it seems that the habit of persistence is one that should be highlighted and developed in first year undergraduate students. The tutor makes a strong case for the explicit teaching of the notion and importance of persistence, and recommends strategies that can be used to enhance student demonstration of the habit. She advocates particularly for a strong emphasis on reflection of learning, shared experiences and positive feedback in a structured and supported learning environment. However, as this study was restricted to results over one term, its findings are preliminary. It is neither able nor intended to address the issue of measuring the long-term impact of such strategies on the future success of the students involved. It provides evidence that students may require more than one exposure to the habits of mind such as persistence. Further research would be needed to measure specific student learning outcomes that might help establish that 'persistence' helps students to achieve academic success.

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