



## Using Stories in Human Science Lectures: Demonstrating Relevance

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The case-study stories were designed to stimulate learner interest, using relevant workplace examples. These stories were shown to provide a contextualised illustration of theory in practice, helping learners to understand the interplay between theory and practice.



### Background

Making links between students' science knowledge and their future workplace practice has been identified as a significant problem for nurses. In a study by Aikenhead (2005), only a small proportion of nurses (one of the six in his study) used "canonical science content in their clinical reasoning, a result consistent with other research". He concluded that evidence to date supports the contention that most nurses draw on their professional knowledge of nursing rather than on science curriculum content when engaged in clinical reasoning.

In an effort to determine ways of helping students to make these workplace links, we carried out a research project that tested interventions in science teaching in applied health undergraduate degree programmes at Wintec (Gibson-van Marrewijk et al., 2008). One of the interventions was the use of stories or narratives. The use of a narrative approach using rich contextual stories had previously been reported to enable analysis that exposed the underpinning science (Aikenhead, 2005; Benner, 2001). By such a method, it was hoped students would become effective learners and users of the science knowledge they were taught (Gilbert, Hipkins, & Cooper, 2005).

Typically, a lecture or laboratory class was introduced with a case-study story designed to stimulate student interest and enable students to see where the lecture or laboratory content would be useful to them in their future workplace practice. One observation from this study was that stories appeared to be more effective if, as well as providing a contextual illustration of the relevance of the intended learning, they integrated the context with concepts in ways that provided links with both theory and practice.

To complete this good practice publication, students were surveyed to find out more about the effectiveness of the stories and what particular qualities in the stories effectively helped students make links between science lecture theory and its application in future workplace practice.

## Method

A first-year nursing class of 35 students was surveyed. A total of 25 students completed a questionnaire on how well they remembered stories from the second semester of the previous year. They were given a brief reminder of the stories that accompanied eight named lectures and asked to rank them on how well they were remembered using a four-level Likert scale : 1 = I can't remember it at all; 2 = I can remember a little bit about it; 3 = I can remember it quite well; 4 = I can remember it very well. They were also asked to recall as much detail as they could about their best-remembered story, why that particular story was memorable for them, why they thought they were given that story, and whether they thought the stories were worthwhile.

The story that was best remembered was given at the beginning of a lecture on the lymphatic system:

*8-year-old Kevin was playing with a spade in the garden. The spade hit his foot and left a 2-cm cut at the base of his right big toe. Kevin knew he would be in trouble as he had been repeatedly told to wear shoes when playing with items such as spades. He opted to try and keep it quiet. He applied some nice cool soil to the cut and it greatly alleviated the pain and stopped the flow of blood.*

*3 days later, Kevin woke to pain in his right groin region. The first question the doctor asked was whether he had any cuts on his foot! He was forced to reveal a pussy, inflamed and very dirty wound. He wondered how this could have had anything to do with his groin.*

This was closely followed by a set of three stories that were all included in the same lecture on body fluids:

1. *In January 2007 Jennifer Strange, a 28-year-old woman from California, was found dead in her home after trying to win a Nintendo Wii game console in a radio station's "Hold Your Wee for a Wii" contest, which involved drinking large quantities of water without urinating. The coroner blamed the drinking of too much water on her death.*

*Do you believe the water killed her? Could you die from drinking too much water? What would the cause of death be? Was there something wrong with her kidneys? How much water is it safe to drink?*

2. *In 2006 Dave Buschow was led by guides on a wilderness-survival adventure designed to test physical and mental toughness in a Utah desert. On the 2nd day after 10 hours without a drink in the 40°C heat Dave was pale, wracked by cramps, his speech was slurred, and he was hallucinating so badly he mistook a tree for a person. Shortly after he collapsed and died.*

*Could you die from not having enough water? What are the symptoms that indicate there is a danger? What is the cause of these symptoms?*

3. New Zealand race-walker Craig Barrett collapsed during the last kilometre of the 50-km walk in the 1998 Commonwealth Games. He became confused and disorientated and staggered aimlessly before being removed from the race and successfully treated.

*Craig had been drinking during the race to prevent dehydration, but was he drinking water or “sport drinks”? Is the difference important? Did he drink too much, or not enough? How would you be able to tell? What was the appropriate treatment?*

The story that was least remembered introduced a lecture on the heart and blood vessels:

*Imagine yourself working in a hospital ward a few months after you completed your nursing course. You are working at night and are checking on a patient. The patient is curious about a small air bubble travelling down his IV drip line. He starts asking you questions: “Should you stop the drip? Where will this bubble go if it enters my body? Will it go up, or down my arm? Can it cause me any harm? Will it go to my heart? What is the name of the blood vessel the needle is in? Does blood always travel in the same direction in the blood vessels?”*

*As you answer his questions he becomes curious about his heart and asks, “How big is it? When I listen to my heart I hear 2 noises. Are they caused by one side beating and then the other? How come I only feel a single beat at my wrist?”*

The next least remembered story introduced a lecture on blood pressure:

*Mrs Chang arrives in the ward and you have to admit her. As you approach her to explain that you will be doing her vital signs, she stands up and feels very dizzy. You make her lie down and quickly take her vital signs: blood pressure = 120/80 mmHg, pulse = 75 beats per minute, temperature = 37°C and respirations = 15 per minute. You know that monitoring a patient’s blood pressure is one of the important activities of a nurse.*

*You suddenly wonder whether the reading would be the same when using different methods. Would it make a difference whether the sphygmomanometer is level with the patient’s heart or not? Do the cuff sizes make a difference?*

One week after the first survey, the same group of students was re-surveyed. The above information about the two best and least remembered stories and the stories themselves were provided. Students were then asked to choose one of the stories and explain what the corresponding lecture was about, why they thought we told them the story, whether they thought the story helped their learning, and why they thought certain stories were remembered most and least.

## Results and interpretation

### Why some stories are remembered better than others

The first survey revealed that with only a hint to help them recall the stories, 33% of the students thought they remembered the story about the boy who cut his foot with the garden spade “very well” and a further 17% remembered it “quite well”.

In contrast, the least remembered story was ranked “very well” and “quite well” by only 1 student each, while 58% did not remember it at all.

Student explanations of the characteristics of the stories that they thought made them memorable can be grouped into five categories:

**1. The story resonated with personal experience.**

This particularly applied to the garden spade story. Several students had a similar experience, or knew somebody who had. The need to closely monitor the state of hydration of children during exercise was also mentioned by one student.

**2. The story was true.**

The body fluid stories were particularly referred to here. It is interesting to note that the two most remembered stories were presented in a factual, third---person style, whereas the two least remembered were hypothetical situations in which students were asked to imagine themselves in a future workplace scenario.

**3. The story featured a famous person or received media attention.**

This was mentioned in relation to the body fluid stories and also another story that included a well-known sportsman.

**4. An emotional response was evoked.**

The body-fluids story about the woman who died from over-hydration evoked the strongest responses; for example:

*"I remembered this story because I found what happened absolutely fascinating and went home and told my boyfriend and flatmates all about it".*

*"I found it memorable because I found it quite shocking that it could happen".*

An element of surprise was also an effective memory prompter:

*"... it tricked me. ...it sticks with you because everyone thought he (Craig Barrett) would have had NOT enough water, but he had had too much."*

Several students also thought the most-remembered stories were more interesting and entertaining than the less-remembered ones.

**5. The story was reinforced.**

The hydration stories were revisited in a kidney laboratory class in which volunteers were weighed after drinking quantities of water, and their urine was analysed. Also, the use of three stories in the same lecture contributed to the element of surprise that was remembered particularly well by one student. The third story would not have been as effective if the first two had not been included.

When specifically asked why the best-remembered stories were better remembered than the least remembered ones, additional statements gave clues as to why some stories may be less memorable. Comments such as "The first 2 were straightforward & the second two were too complex" and "The last one seemed too 'PRECISE' and number orientated" suggest that too much detail hinders recollection of the stories.

**The value of the stories to the students**

The students linked the stories with the lecture content and this appeared to help their understanding of the lectures. When provided with the best and least remembered stories, the students had no trouble describing what the lecture was about, even though the link between the story and lecture content was

not always obvious. For example, in the case of the story about the infected foot wound, the students needed to remember that the groin pain was related to the lymphatic system. Again, all the students who chose this story correctly related it to the lymphatic system. As one student stated - "... it helped me better understand the lymphatic system – when I am trying to recall this – I immediately think of the story".

When asked why they thought they were told the story, students' answers varied depending on which story they referred to. In the case of the hydration stories, many commented on the seriousness of hydration imbalances and many also related this to symptoms they would look for in the future when they experienced similar situations. The students realised it was possible they could find themselves in a relatively normal situation that could have a potentially fatal outcome. This was reinforced by one student who said she nearly died from an electrolyte imbalance and that the knowledge gained could save lives.

In contrast, with the lymphatic system story most students thought they were told the story to help understand the lecture and remember the structure of the lymphatic system. An infected wound is again likely to be experienced, but the students may have perceived the condition to be less severe, resulting in less linking of theory with future practice. Another possibility is that the students did not see the consequences of this condition being so directly associated with the role of a nurse.

When asked whether a selected story helped their learning, the responses were very positive:

*"Yes, it told me that the symptoms (of hyper- and hypo-volaemia) are very similar"*

*"Yes, it pointed out stuff for us to look for as nurses"*

*"Yes. It triggers me to think of the reason for the case to happen, and immediately directs me to the lecture content"*

*"Yes, it makes it real."*

### **The drawbacks of using stories**

In view of the positive response from students, the only conceivable drawbacks to including stories in teaching are the time it takes to prepare them and the time used in lectures to discuss them. Preparation of effective stories students will remember is important – but such preparation takes time.

Generally, the stories don't add a lot to lecture time. The usual practice is to tell the story at the start, refer back to it throughout the lecture as relevant points are covered, and then discuss it at the end to ensure the concepts and questions raised by the stories have been satisfactorily addressed. In the case of the lecture on body fluids, in which three stories were used, the content of the lecture was reduced to enable discussion time. The tutor considered that a small reduction in content was well worth the extra learning of the really important concepts he wished to teach in the lecture.

## **Summary**

The science tutors teaching in the Nursing and Midwifery degree courses at Wintec routinely use stories in their lectures and laboratory classes. This research has demonstrated that such stories help students make links between lecture theory and future workplace practice.

Practical suggestions to make stories more memorable for students are to base them on true events (preferably involving well-known people) that could conceivably happen to anybody, in which the outcome is serious enough to evoke an emotional response in the reader. The stories need to raise questions in the minds of students that are answered during the lecture and it is hoped the students will

feel information in the answers is important for future workplace practice. The stories should not be too complex and should be reinforced throughout the lecture and in laboratory classes.

This practice could actually be used to supplement lecture content in any tertiary courses.

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