Teaching IT through storytelling

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ABSTRACT

This article explores the use of storytelling as part of an overall approach to the teaching of information technology in tertiary education. The author defines the context of use of storytelling in terms of the various types of education being delivered and the delivery methods, and then explores the potential uses and benefits of storytelling. A sample story is included and briefly analysed to illustrate how a story might be used; the author also reports on his own experiences of the use of storytelling in his teaching activities. Finally, a detailed checklist is presented of the issues to be considered when using the storytelling approach.

KEYWORDS: Case study; information technology; stories; storytelling; teaching; tertiary education.

1   INTRODUCTION

The teaching of information technology (IT) in tertiary education (TE) has many dimensions and issues to be considered, the primary aspects of which are represented in the following quotation from one of the most easily recognised 'Just So Verses' of Rudyard Kipling:

> I keep six honest serving-men
> (They taught me all I knew);
> Their names are What and Why and When
> And How and Where and Who. [9]

What methods are available for teaching IT? Why will one particular method be chosen in preference to or in combination with any other method? When might one or more teaching methods be used? How might those selected methods be used? Where can one learn about the various methods available and their suitability for use? Who are the teaching staff delivering the education, and how skilled are they in the method(s) used? Who are the students who are to be educated using the chosen method or methods, and to what extent do their needs and expectations very?

The focus of this article is to explore the use of storytelling in the teaching of IT in TE in contemporary South Africa (SA). In so doing, this article will help:

- To stimulate critical debate on the application of the possible approaches to teaching information technology, with specific reference to storytelling;
- To share lessons from the literature about the use of storytelling in teaching;
- To stimulate sand assist with the personal professional development and the development of new skills for academics in the use of storytelling;

- To support the dialogue and sharing of ideas with regard to the optimum use of storytelling (and the way in which it can be supported by emerging technologies).

The article defines the context of use of storytelling in terms of the various types of IT education delivered and the delivery methods selected, then explores the potential uses and benefits of storytelling, with specific application to teaching and presents a sample story. The author then shares some of his anecdotal, personal experiences of using stories and storytelling over a number of years. The article concludes with a suggested checklist of the issues to be considered when using the storytelling approach.

2   WHO IS TO RECEIVE THE IT EDUCATION?

One of the realities of teaching IT to students in TE is that there is a wide range of possible roles for which the students are being prepared. For example, there are the professional technologists (where that term is used with broad application). Future job roles for this group may include (at various levels of seniority): analyst; designer; programmer; architect; consultant; researcher; technologist; administrator (such as in the database field); and technology support. These roles may be assigned to focus areas such as hardware, systems or application software, networking, and so on. Some of these roles may require not only traditional certification by the teaching institution through the award of certificates, diplomas and degrees, but also may lead to specific certification recognised by the IT industry (particularly where proprietary solutions are concerned, from suppliers such as, for example, Cisco, Microsoft and SAP).

The second focus area for the development of IT knowledge and skills in students in TE is for those stu-

dents who, although not expecting to become professional technologists in the field of IT, require some basic or survival skills to enable them to complete their studies. These skills may include basic computer literacy skills (now often acquired during primary and/or secondary education), or specific skills to enable the completion of their studies when using sophisticated applications such as statistical analysis tools (such as when conducting quantitative research). In that sense, the development of IT skills of these students may be as an enabler for other aspects of their education to be completed. In this focus area it is also possible to achieve recognition through certification, either through the academic institution itself, or through a qualification certified externally (such as the International Computer Driving Licence – also known as the ICDL).

A third broad category of IT student in TE is that concerned with the development of management knowledge and skills. These may be developed as part of undergraduate or postgraduate courses addressing a wide range of management topics, which include but are not uniquely focused on the subject of IT. Examples of this would be in general management programmes, such as those found within the faculties and departments of management and business in TE institutions. In certain cases, this education may include the development of management skills with a specific focus on the IT part of the business (such as the development of future managers of various aspects of IT use in organisations, including future or existing Chief Information Officers).

In summary, for the purposes of this article therefore, there are three broad types of student audience to be addressed in the teaching of IT in TE (at undergraduate or postgraduate level): technology specialists who have a career in IT as their objective; students who require basic competency in the use of IT as a facilitator for the completion of their own education; students who are completing management education and who need to understand IT as an aspect of their overall management education.

These different types of students may be taught in teaching groups of various sizes. In broad terms, academics have the opportunity to teach on an individual, small-group or a large group basis [22, 24]. Individual or one-on-one teaching would typically take place where either the student is receiving individual instruction (including guidance, coaching, or mentoring) or feedback on their individual performance (such as through presentations, examinations or other forms of assessed assignments). Small group teaching may happen where groups of students are gathered together (for example in the case of seminars, workshops, lectures or practical exercises). Large group education would most often take place through the use of traditional classroom or lecture-hall based delivery. Larger groups can include group discussions and tutorials; smaller groups may also be managed in the following ways [24]: seminars; buzz groups; brainstorming; role plays; field trips; small group discus-

sion; simulations; games; group activities; projects; self-help groups; workshops; guest speakers. The role for the teacher in group instruction includes that of leader, consultant, facilitator, participant, or observer [24], and the choice of the role adopted may have a significant impact on the particular teaching method used.

3   WHAT METHODS MIGHT BE USED TO DELIVER IT EDUCATION?

The selection of a particular teaching method may depend on whether the focus is more oriented towards skills development (the practical ability to execute a particular skill, which can be closely aligned to the concept of training) as opposed to a general understanding of a particular knowledge area and the acquisition of the ability to distinguish between concepts (more widely associated with education). An illustration of this difference is the concept of sex *training* (the ability to perform specific acts) as opposed to sex *education* (an understanding of the general concepts involved).

The choice of delivery method depends on a number of factors [24]:

- The number of learners;
- The type of learners, whether homogeneous;
- The type of content being taught;
- How much time is available to develop learning materials;
- How often the course is taught;
- The number of staff involved in teaching the course;
- Attitude of the staff;
- Number and type of support staff;
- Type of learning environment;
- The physical design of the learning environment;
- The funds available to develop the course;
- The administrative environment.

The most widely used and traditional method of education is that of the passive role of the student and the active role of the educator through the use of lectures. But this is not the only possible approach. Where the student is made an active participant in the learning process (active learning) the traditional lecture approach becomes largely irrelevant. Active learning comes in many guises, and may include the use of case studies, goal-based scenarios, problem-based learning, case-based reasoning, simulations and role-plays [12, 22, 24, 34, 35, 49, 61, 64], each of which approaches may have a role for the use of storytelling to reinforce, enhance or complement the other active learning methods. Case studies often present the context of a problem as well as illustrating the main learning point through a real-world setting, supported by appropriate data [12, 22, 64]. Case-based reasoning tends to focus on solving new problems based on similar past problems, without necessarily having a real world setting, and is an example of analogy making. It may also depend on anecdotal evidence, in contrast

to the case study which is more often based in real-world data [35, 61]. Goal-based scenarios rely on the teacher constructing a goal and students must apply certain knowledge and skills to achieve that goal. This method does not rely on a real-world case nor does it seek to specifically learn from previous examples, as in the case-based approach [49]. Problem-based learning seeks to encourage learning without the requirement to have a fully-developed case, and may also not have a specific goal to be achieved [34, 35]. Role plays may involve the 'acting out' of a particular scenario to help to stimulate not only active participation and involvement by the student but also assist in the visualisation of a particular problem under discussion [24]. There are various types of simulation, including those based on computer-assisted and non-computer-assisted techniques, which without replicating a particular real-world case and without learning from previous cases, without the deployment of a role play, seek to actively engage the student through participative action to simulate a real-world-like scenario [24]. Each of these approaches to active or action learning may, either individually or in combination, be used in conjunction with storytelling to further enhance the learning experience.

Recognising the existence of many alternatives open to the educator, a focus on the use of storytelling as a teaching method reveals that stories can be used in at least three different ways to support learning. First, as exemplars of concepts, principles, or theories being taught by direct instruction. Second, they can be used as problem cases to be solved by students: "selecting stories that have particular lessons to be learned in representing them to learners as problem cases is a well-established teaching strategy" [35]. Third, cases, or cases told as stories, "can be used as advice for students, for helping them learn to solve problems. Students must examine the problem to be solved and construct meaning from similar cases in an effort to solve the current case," and "because stories are essential to solving complex, everyday and professional problems, we believe that stories should form a basis for learning how to solve those problems" [35].

Whether the focus of the education is on active or passive learning, whether there is more of an emphasis on training or education, there may be a role for the use of storytelling in teaching. The next section therefore will look at the background to the use of storytelling as a possible approach.

4 BACKGROUND TO THE USE OF STORYTELLING

Stories, including myths, legends, and folktales have been used to pass on wisdom, knowledge, and culture for thousands of years [37, 46]. Aristotle defined the classic 'beginning, middle, end' story structure more than 2,300 years ago and this has been used by countless others, "since it seems to reflect how the human mind wants to organise reality" [31]. The word *story* has its origins in the 13th century, and literally means

an account of incidents or events. A story may be a fictional narrative, shorter than a novel, or a recital of real or imaginary happenings. It has synonyms in narration, narrative, tale, and yarn [38, 58]. The English word *story* and the related words *narrate* and *narrative* have their roots in Latin and Greek words for knowing, knowledge and wisdom [25, 58]. Some authors [7, 15, 17, 41, and 50] have used the terms *narrative* and *story* interchangeably. Stories typically possess a setting, a cast of characters and a plot that resolves some sort of crisis [25, 59] and "a story describes a sequence of actions and experiences done or undergone by a certain number of people, whether real or imaginary" [Ricoeur in 3].

Stories may also be very brief, presented by way of an anecdote which is "a usually short narrative of an interesting, amusing, or biographical incident" [38]. Slightly longer than an anecdote, but shorter than a story, is the vignette. Vignettes have been described as "short stories about hypothetical characters in specified circumstances, to whose situation the interviewee is invited to respond," [23] and "short scenarios in written or pictorial form, intended to elicit responses to typical scenarios," [29]. They are also described as "concrete examples of people and their behaviours on which participants can offer comment or opinion," [28] and "stories about individuals, situations and structures which can make reference to important points in the study of perceptions, beliefs and attitudes" [30]. In a specific application, these anecdotes, vignettes and stories may relate to real-world experiences and describe the achievement of a particular goal in often difficult circumstances. Generically, these are sometimes known as *war stories*, where the learner is vicariously learning from the experiences of others [42].

With specific reference to sharing knowledge (which includes teaching), the use of stories through storytelling is a valuable knowledge sharing practice and the significance of story and storytelling is apparent when one reviews the current body of published research [4, 58]. It is already deeply a part of the general learning culture and is easy to adapt to knowledge sharing goals and objectives [34] and "throughout history, the dominant method for communicating and conveying ideas has been to tell stories. Stories can be used very effectively as instructional support systems helping people learn to solve problems. Humans appear to have an innate ability and predisposition to organise and represent their experiences in the form of stories" [34].

4.1 Storytelling formats

Since earliest times stories have been told in many formats, including oral delivery, painting, tapestry and written forms [58]. Table 1 indicates some of the formats identified in the management literature for the telling of stories, and these can then be applied in teaching of IT in TE. These authors, in some cases, express a strong preference for a particular format: Armstrong [2] and Roth and Kleiner [47], for example,

Storytelling formats	Source
Oral format.	BSI [7], CEN [8], Denning [14, 15, 16, 17, 18], Edmond and Tilley [19], Jensen [33], Snowden [51, 52, 53].
Through images and objects.	BSI [7] Edmond and Tilley [19], Jensen [33], SAI [48], Williams [64].
Using drama.	CEN [8], Edmond and Tilley [19].
Written format.	Armstrong [2], CEN [8], Denning [14, 15, 16, 17, 18], Jensen [33], Roth and Kleiner [47].

Table 1: Storytelling formats (based on [58])

for the use of the written format; while others, such as Edmond and Tilley [19] have a much broader view of the formats in which stories might be presented.

As shown in Table 1, formats of storytelling may be many and varied, used individually or in combination. These may include, in addition to simple oral delivery, the use of drama (possibly on stage, live or recorded on video, all of which are feasible in today's better-equipped tertiary institutions); a variety of print and online media (such as magazine, books, various types of images, possibly circulated via email, web sites, chat-rooms and so on); and presentation technologies (including computer-based applications such as Storybook Weaver, Microsoft Moviemaker and the widely-used Microsoft PowerPoint).

4.2 Storytelling structure

Table 2 indicates a number of views from the literature of how storytelling may be structured. Even though there are some differences in the approaches proposed, these authors seem to agree that every story has a beginning, a middle and an end; it includes a flow of events that happen involving characters who undergo an experience during the story; a story will often involve a challenge or opportunity with an eventual resolution.

4.3 Uses of storytelling

Stories can be used for a wide range of possible purposes, some of which are of particular relevance to the teaching of IT in TE, and are represented in Table 3.

4.4 Benefits of storytelling

What are some of the possible benefits of using storytelling in an education environment? Table 4 shows some of the benefits which have been identified in the literature which have a bearing on storytelling in teaching IT in TE.

A specific illustration of the use of storytelling in a learning environment is as follows:

> We would have four or five bullet points that we were hoping that people would learn. We

Storytelling structure proposed by Ibarra and Lineback [31]	Storytelling structure proposedby Parkin [43]	Storytelling structure proposed by Sole [55]
Introducing a protagonist the listener cares about. Providing a catalyst compelling the protagonist to take action. Trials and tribulations. The story's second act commences as obstacles produce frustration, conflict, and drama. A turning point. This represents a point of no return, which closes the second act. A resolution. This is the third act in which the protagonist either succeeds magnificently or fails tragically	Once upon a time – the status quo,where the story begins Then one day – the characters encounter some problems or challenge Because of this – the story changes direction to deal with the problem The climax – the characters deal with the challenge The resolution – the results of the action The moral – their lives are changed	Story-crafting: the story itself, including the design of the story, level of complexity, relevance Story-telling: who tells the story, whether it is oral or captured, use of media Story-listening: monitor the reception, use the feedback for design and content of future stories

Table 2: Structure of storytelling (based on [58])

were spending our time focusing on the precise wording of those bullet points. What we discovered almost by accident was that the wording hardly mattered. The only points people remembered one or two weeks later were the points that had been embodied in a story. So we told a great story, then people remembered the points. Otherwise not. We found that when people would come to a meeting a couple of weeks later, they had completely forgotten the bullet points, but they could repeat the story back to us almost verbatim. Following the story, they knew what they were supposed to have learned. That was a powerful discovery [6].

Uses identified	Source
Allow the communication of complex ideas	Snowden [52].
As cautionary tales (horror stories) and success stories	Reamy [46].
Embedding sustainable lessons learned	Reamy [46], Snowden [52].
For problem solving	Brown, Denning, Groh and Prusak [5], Mitroff and Kilmann [39], Orr[42], Sole and Wilson [54].
For teaching and learning	Brown and Duguid [6], McLellan [37], Orr [42], Sole and Wilson [54].
For knowledge sharing and knowledge transfer	Brown, Denning, Groh and Prusak [5], James and Minnis [32], Reamy [46], Stewart [56].

Table 3: Uses of storytelling (based on [58])

Benefits identified	Source
Stories are fun to work with	Armstrong [2]
Stories are more effective in sharing knowledge in diverse populations	Snowden [52]
Stories enable people to understand things in meaningful and relevant ways	Kaye and Jacobson [36]
Stories encourage a broader understanding	Kaye and Jacobson [36]
Stories enjoy widespread acceptance as a means of communication	Hansen and Kahnweiler[26]
Stories make it simple to communicate a message	Armstrong [2], Sole and Wilson [54].
Stories make the message more memorable	Armstrong [2], Wilkins [63].

Table 4: Benefits of storytelling (based on [58])

In summary, there are many benefits, which have been identified, supporting the use of stories and storytelling as a method of teaching IT in TE. By using stories, the key benefits brought to teaching are that the lessons to be learned can be made, in the minds of the students, more memorable, meaningful, easier to learn, longer lasting in their impact and of greater value.

4.5 Sources of stories

What are some of the possible sources for the stories to be used in teaching IT in TE? These may arise from the personal experiences of both the educators and those of the students. The educators may have a broader range of experiences that he or she can draw upon, but the opportunity should also be used to draw on the stories which the students have to tell. These may be based on their personal use of IT in the home; at school; in dealing with officialdom (government department at local, provincial and national level); business institutions (such as cell phone service providers and financial institutions); and even the students' own academic institutions. Given the extensive use of IT in everyday life there are sure to be plenty of stories which can be drawn upon.

5 STORYTELLING IN TEACHING IT IN TE

The use of storytelling in teaching (whether in IT or other field) is not as well established nor as commonly accepted as the more traditional logical or scientific content-based lecture method [35]. Why should this be the situation? "Logical exposition, the preferred medium for scientific discourse, applies formal and empirical proofs, while narrative convinces through verisimilitude" [35]. However, despite this claimed reluctance to use storytelling more widely, this approach can often be found in use in a related approach to teaching: the case study. The case study has been widely-used since the 1870s in a number of fields such as law and medicine [34, 64], and since the 1920s in the field of business and management studies [22, 27]. There are many advocates for the use of the case study as a teaching method [12, 22, 27, 34, 35, 44, 61, and 64].

"Cases are valued because they simulate authentic activity that is situated in some real-world context. They usually simulate real problems that have occurred in business, law, medicine, teaching, and just about any other applied field" [62], and one of the most important rationales for case-based instruction is that it at least simulates the kind of activity that students are preparing for [27, 34]. Cases also allow students to participate in discussing the analysis and solution of relevant and practical problems by applying theory to practice, with learn by doing [22]. Cases may also increase the students' enjoyment of the topic and hence their desire to learn [12]. It should be noted, however, that not all cases are presented in a story (narrative) format, nor are all stories necessarily presented as cases.

One of the most powerful ways to present a case is through the use of the story format, whether oral or through the use of multi-media support [34, 64], and the use of the case method may be improved through use of a story format [64]. Jonassen and Hernandez-Serrano [34] stated that "we propose that in order to educate professionals equipped to deal with the complexity of workplace situations.we should expose them to stories generated at the workplace. One way to do this is by exposing them to narratives or stories of cases that have been compiled into a case library (database of stories made available to learners as a form of instructional support)" and concluded that the use of stories should be seen "as a primary in-

structional method" [34]. The same authors claimed that "stories can function as a substitute for direct experience, which novice problem solvers do not possess. Supporting learning with stories can help students to gain experience vicariously," [34].

Given the strong theoretical basis for the use of storytelling in the teaching of IT in TE, it may be useful to include a story which will illustrate the potential for the use of storytelling. This case study has been written by the author and is used as part of his teaching of IT to management development students at a South African business school. The case is entitled "Prime Property Group (PPG)," and tells the *story* of a board meeting for a real estate company. This is an example of the use of a case presented in a *story* (narrative) format: its delivery might be through being read before class by the students or acted out during class as a role play. It is presented here in its entirety (at just over 1000 words).

[Story begins] "I may be the boss but that does not mean I have all the answers" said Mary as she settled down at the start of her weekly board meeting. Gathered around her at the table were the members of her executive team in whom she had placed so much trust over the last several years and with at least some of whom she now shared a growing sense of unease. "But Mary, I really don't believe we have a long-term problem" commented John, her financial director "after all, we're still making a healthy profit on the deals that we are concluding, it's just that there's less of them these days. But we all know that this market has its ups and downs." "I don't agree" observed Sally, head of franchise operations, "if we don't take action soon we'll be losing serious ground that we'll find difficult if not almost impossible to recover". "What do you mean?" asked John, head of finance at PPG. "I'll tell you what Sally means" replied Mary, regaining control of the meeting, "we have seen too many of the smaller players in this industry disappear over the last few years in circumstances similar to ours. The big groups, often with significant financial backing from international partners, are busy squeezing companies like ours out of the market".

Mary's observation was undoubtedly true, given the consolidation that had happened in the real estate business over the previous decade. The number of smaller players had continued to decline and their share of the market in the hands of those few smaller players remaining had also been adversely affected by the voracious appetites of the larger industry rivals. In all of the major sectors in which PPG was active, from residential and commercial sales through rental management and auctions, every aspect of the business was under pressure. Operational costs continued to rise and margins were increasingly threatened due to changing expectations as to the level of commissions that could be charged in a competitive market. At the same time, all of the traditional major retail financial institutions, and a number of start-up niche players as well, were undermining the ability of PPG to supplement its income through commissions earned on arranging finance for property sales.

"Maybe we need to radically rethink our business model" added Mary, "particularly in the light of the increasing sophistication of the people that we deal with. For example, I am ever being asked by our clients to send them pictures to their cell phones of properties which we have on offer as well as a detailed profile of the property itself." "I was browsing one of our competitor's web sites the other day" commented Jane, the most senior marketing executive in PPG, "and was amazed at what they had to offer. We are getting seriously left behind!" "I know what you mean," added Mary. "If it's not a virtual tour of the property, complete with the ability to simulate how it looks in daylight as well as after sundown, it's the ability to see the property within the context of the suburb in which it is located in relation to all major amenities, such as schools, shops and so on." "I can't believe how little we have evolved the way we work over the last 10 years" said Sally, "after all look at the pathetic way in which we still use a very basic system to keep track of both buyers and sellers".

"As bad as that," added John, "is the long delays we sometimes experience in bringing in the commission due to us, causing us unending problems with cash flow and dissatisfaction from our agents in terms of late payments to them." "Cell phones have become somewhat of a mixed blessing" commented Mary "as although they provide an opportunity to significantly improve communications, the costs of doing so seem to be spiralling out of control." "I can support that!" added John. "In fact" said Mary "at the rate that we are going, people both buying and selling residential property will start to bypass us completely, using the internet in all sorts of creative ways we haven't even thought about, putting our very survival under serious threat." "That may be so" said Jane, "but I find it hard to believe that the traditional real estate agent as we know them will completely disappear over the next few years. Surely there has to be a role for an organisation like ours?" "Well whatever we get up to on the sales side of the business," added John, "our back-office systems are certainly due for a significant overhaul. We haven't spent any serious money on our IT for some time, and judging by what some of you are planning to do to improve the situation we're likely to be facing a big bill in the near future." "Let's not get distracted right now as to whether we can afford something we haven't even decided to do" responded Mary. "What I'm more interested in are some creative ideas as to how we can turn this situation around".

"Well, I'm not sure you'll all like this idea, but my brother, Alan, works as an independent consultant helping small and medium businesses just like ours understand how to improve their competitive position and profitability" said Sally. "Just because he made me look ordinary at our last golf day," smiled John, "is not going to put me off working with him if he really can help to make a difference." "It's not his golf handicap that I'm worried about," replied Mary, "it's the fact that he has an MBA from one of those busi-

ness schools down in the Cape that makes me wonder whether he's not going to be full of bright, high-flown, theoretical ideas, as well as charging us a fortune for them!" "Well I'm willing to give him a try, professionally, not personally I mean!" chuckled Jane. "Okay" said Mary "I'm not much of a democrat but let's put it to the vote." "That's decided then," said Sally with an air of satisfaction. "I'm seeing Alan for a drink this evening and I'll ask him whether he's willing to get involved here at PPG, and how he wants to proceed." "I'm happy with that" added Mary "and given the progress we've already made in this meeting I think we should quit while we are ahead. Let's all meet again as soon as Alan is ready." [Story ends]

This story can be used to teach a number of principles of the management of information technology, such as:

- The role of an IT strategy to this organisation;
- The benefits from implementing that strategy;
- Leveraging the use of technology in areas such as a listings of sellers, buyers and matching those two groups;
- The use of technology to help reduce cell phone costs;
- What communication facilities with sellers and buyers will most enhance operational efficiency and competitive advantage;
- The role of IT outsourcing for this business;
- The role of business intelligence in helping to understand external market pressures and internal performance;
- The nature of the business case which might be constructed to support recommended changes to current levels of IT investment;
- What the business needs to know to survive and thrive;
- The role of consultants.
- What are the possible ways of proceeding from here.

This story has a particular set of possible learning objectives and relates to management development, one of the three groups of student types identified earlier in this article. It is clear that other stories (or anecdotes or vignettes, shorter than stories but still having a story-like structure) could be constructed and used for other learning objectives (including their use to relate *war stories* relating to the educator's own experiences which are used to illustrate the particular learning objectives).

There is no doubt that all these issues could be addressed by the traditional lecture method but the use of a story (as suggested by the literature, and supported by this author's own experience) makes the learning experience more interactive (discussing the story), more memorable (being based on people and their circumstances), more realistic (students can often identify with the scenario being portrayed). Such ways of encouraging active learning might include syndicate and/or plenary discussions of the key learning points arising from the story; roles plays where

students are encouraged to 'act out' scenes from the story; participation in the creation of 'alternate story endings' where students actively participate in creating a new way of deriving learning points from the story; the creation by students of additional stories which use the existing story or stories presented by the lecturer as a model or example story. Few of these additional techniques and learning opportunities arise easily from the traditional case study method already discussed in Section3, as this method is often much more deterministic in its design and execution, even where discussion is encouraged.

This sample story also indicates some of the potential advantages over the other active learning methods which were briefly discussed in Section 3 of this paper. Storytelling does not require a particular real-world scenario to be presented, indeed some stories are all the more powerful for being independent of a particular 'case' which may encourage closed thinking by the students. Stories can be used to enhance learning without being focused on a particular problem or goal (as in goal-based or problem-based approaches), and yet may involve the opportunity to strengthen the use of role-play activity (in the telling of the story) and simulation of a particular real-world scenario as an element of the act of storytelling. In other words, storytelling can provide both an attractive alternative and complement to other teaching and learning methods.

6 AUTHOR'S EXPERIENCES IN THE USE OF STORYTELLING

The author's own experience can provide some (albeit informal and subjective) potentially useful pointers for the use of storytelling in the teaching of information technology in tertiary education. This evidence can be justified in terms of the use of a single case [65] for the purposes of this article, although the author recognises that a further more rigorous study into the uses of storytelling is required. He has been developing and delivering management education for a number of institutions for the past ten years, addressing an audience of several thousand candidates, through in excess of one hundred management development programmes. It is this experience that prompted the author's interest in investigating the potential for formalisation of the use of stories and storytelling, and led to his doctoral studies which explored the use of stories and storytelling to share knowledge in a specific environment [58].

The author's own experience is that storytelling can be very effectively used as a teaching tool both formally (such as in a case study discussion), and informally (such as the telling of a personal *war story*). Complementing the evidence presented earlier in this article by other authors [12, 22, 27, 34, 35, 44, 61, and 64], this author has found that a number of parameters effect the extent to which his storytelling may be successfully used in the classroom:

- The age of the students compared to the age of the storyteller: there is the potential for a gen-

eration gap to interfere in the successful use of storytelling as part of the education process;

- Language: the potential that the choice of language may interfere in effective communication either because of the level of complexity of the language used (for example specialist vocabulary) or the failure of the story listener to interpret the language as used;

- Expertise area of the listener: prior experience in the subject matter being discussed, about which the story is being told, they enhance or detract from the effectiveness of the storytelling experience;

- Organisational background of the student: prior experience within a particular organisational setting may lend the storytelling experience a higher or lower degree of realism;

- The nature of the topic being discussed: the storytelling experience may have a high level of recognition based on the prior experience of students where alternatively the subject matter may be so foreign to the student that the real meaning of the story is lost;

- The duration of the story: some storytelling experiences are more effective where a shorter, anecdotal or vignette type story is used, possibly to introduce a "war story" which the lecturer wishes to share;

- Culture, ethnic group or nationality; the setting for some stories they have a higher or lower level of affinity with the background of the individuals listening to the story;

- Seniority of the audience: the storytelling experience may be more or less effective according to how well the story is constructed to meet the expectations of the audience in terms of their position within their own organisation and therefore their expectations of the message contained within the story;

- Gender issues: it is important you recognise that some storytelling experiences may be enhanced for both the storyteller and the listener when the issue of gender awareness and potential impact of gender issues are taken into consideration.

It is suggested that a potentially valuable area of future research would be a formal investigation into the extent to which these and other factors have an influence on the effectiveness of the use of storytelling in the teaching of information technology in tertiary education.

7   IMPLEMENTING THE USE OF STORY-TELLING

The implementation issues associated with the use of stories and storytelling in teaching IT can be identified through a review of the literature associated with knowledge sharing (largely drawn from the field of knowledge management). Table 5 presents a checklist of the major themes identified in the literature

Implementation issue	Sources identified
Benchmarking	[1, 7, 13, 40]
Capture and reuse	[14, 15, 16, 17, 18, 22, 35, 46, 64]
Catalogue	[46, 51, 64]
Measures	[1, 7, 13, 40]
Objectives	[1, 7, 13, 22, 35, 40, 64]
Ownership	[1, 7, 13, 40, 46]
Story value rating scale	[58]
Storytelling Community of Practice	[7, 10, 48, 60, 62]
Storytelling techniques	[1, 7, 20, 21, 22, 64]
Storytelling technology	[1, 7, 13, 22, 35, 64]
Success stories of the use of storytelling	[7, 11, 21, 25, 46]
Where not to use stories	[14, 45, 46, 52, 54, 57]

Table 5: Storytelling implementation issues (based on [58])

which can be associated with an implementation of storytelling and is based on the earlier presentation of a similar list [58].

The key issues involved in the successful use of storytelling as a teaching method, based on the sources identified in Table 5 are:

Benchmarking

Comparing the use of stories in teaching IT in TE within and between academic institutions. This can be facilitated by ensuring that appropriate measures have been defined and are used on a consistent basis for internal and external benchmarking activities.

Capture and reuse

Ensuring that stories are captured and made available for reuse in future teaching assignments. This may include creating audio, visual and text records of stories used, with appropriate retrieval methods.

Catalogue

Developing a catalogue of stories which are available for use in teaching assignments, indicating the primary dimensions of the story, such as length; subject matter; lessons to be learned; originator of the story; where previously used.

Measures

Academics and institutions need to ensure that they measure the effectiveness with which story telling is used as part of the overall curriculum. This will include the storytelling abilities of the academic concerned, feedback from the students on the value of the story in use, and so on.

Objectives

It is important that clear objectives are set re the use of storytelling in the teaching of IT in TE. This requires the definition of the motivation behind the use a specific story and associated storytelling techniques for defined learning objectives.

Ownership

Where stories are to be made available for use by a number of academic practitioners, across a range of

different teaching assignments, it is important to identify the owner of the story so that appropriate feedback can take place on the story in use, as well as giving the owner of the opportunity to further develop the story.

Story value rating scale

There is likely to be variability in terms of the value associated with the use of particular stories within the overall teaching curriculum. Therefore, a value rating scale for both the story content and the skills of the storyteller will help to optimise the use of storytelling in future teaching assignments.

Storytelling Community of Practice

Through the creation of a Community of Practice for the use of the storytelling approach, opportunities will arise to share experiences from the use of storytelling with other educators. Through this community opportunities should arise to improve on an understanding of the appropriate use of storytelling to enhance both the teaching and learning experience.

Storytelling techniques

There are a number of different approaches possible when using the storytelling method. These include one-on-one, small-group and large group storytelling, where the storyteller can be either an academic, a guest speaker, or one or more students. Storytelling may also take place through the use of role plays, with the actors usually drawn from the student body.

Storytelling technology

It is important to identify which type of technology to use in connection with storytelling. Oral storytelling may be complemented with the use of audio and video recordings, various types of presentation software and tools.

Success stories of the use of storytelling

Identifying, documenting and circulating success stories of the use of storytelling in teaching IT in TE will help to ensure the rapid spread of the use of this particular approach.

Where not to use storytelling

It is important to recognise that storytelling is not appropriate to use as the single method of communicating content to students. Academics must develop an understanding of where and when not to use the storytelling approach, as opposed to more traditional methods (such as lectures) used for the teaching of theoretical content.

Summary of storytelling implementation issues

In summary, developing a clear understanding on the issues to be considered when using storytelling as part of an overall approach to delivering IT education in TE should increase the success of the total teaching and learning experience.

8 CONCLUSION

This article had several objectives. First, to stimulate critical debate on the application of the possible approaches to teaching IT in TE, with specific reference to storytelling. This was achieved through a review both of the context within which the teaching takes place, as well as the background to the use of storytelling in a teaching environment. This article also shared lessons learned from the use of storytelling through a review of the literature, and thus has helped to stimulate and assist with the personal professional development of teachers of IT in TE and has opened the way for the development of new skills for academics in the use of storytelling. This article has provided a means to support the dialogue and sharing of ideas with regard to the optimum use of storytelling, specifically through the presentation of a checklist of issues to be considered when using the storytelling approach for teaching of IT in TE. In summary, this article has helped to enable collaboration and transformation in tertiary education with a specific focus on the teaching of information technology and the use of storytelling.

END NOTE: This article is based on similar content presented in a paper by the same author to the Conference on Information Technology in Tertiary Education held in South Africa in 2006. The original paper has been expanded to accommodate additional material, specifically in the area of relating the author's own experiences in the use of stories as part of his teaching experiences.

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