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Using Digital Storytelling to Engage Student Learning

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ABSTRACT *No one really knows what the first story ever told in human history was, but storytelling is an art that spans many civilizations and cultures, and continues to be a major part of our modern lives. More recently, storytelling has gone digital with advances in technology and connectivity. Educators have also rediscovered how storytelling can be an effective teaching pedagogy for engaged student learning. A digital story can engage students' visual and auditory senses in a way that the written word alone cannot. This article describes such an effort. The Movie-Door-2-Door.com (MD2D) is a digital story spanning 12 episodes. The story revolves around three young business graduates who started their own business and discovered the role of financial information in managing a business along the way. An independent survey by the University's teaching unit showed that the use of such digital stories can be an appropriate pedagogy to help student contextualize accounting and its role in helping management make decisions. The first four episodes of the MD2D digital story are available for viewing at www.research.smu.edu.sg/faculty/MD2D/.*

KEY WORDS: Digital storytelling, contextual learning, computer-based learning, teaching innovation, student engagement, introductory financial accounting course

Using Technology in Accounting Education

The relevance of developing effective teaching pedagogies in accounting education is increasing in tandem with the growth and development of the profession (Kermis and Kermis, 2010). While several accounting educators have recognized the importance of incorporating effective teaching methods into accounting curricula (De Lange, Suwardy and Mandovo, 2003), students still lament that accounting can be a dull and boring subject (Miley, 2009). Students have also commented that the traditional teaching method appears to lack emphasis on critical thinking and adaptation to real-world contexts (Crumbley and

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Smith, 2000). So the key question is not whether education institutions ought to enact effective teaching pedagogies in accounting, but *what* and *how* to do so. As the accounting profession continues to evolve, its demands and requirements may change, and therefore it is important for accounting educators to adapt their teaching approaches to satisfy changing employer expectations of an accounting graduate (Seow, Pan and Tay, 2012).

Increasingly, educational institutions have leveraged on technology through the incorporation of computer-based learning in their teaching pedagogies (Sadik, 2008). This is helped by the fact that many universities are now equipped with electronic media outlets, tools, software and systems that allow instructors to create multimedia learning platforms for students (De Lange, Suwardy and Mandovo, 2003). Furthermore, the current generation of students is highly acquainted with technology and constantly explores new technological tools to keep up-to-date with knowledge. Nevertheless, results from using technology in teaching have not always achieved desirable learning outcomes (Robin, 2008). In fact, Chang and Hwang (2003) argue that merely adding technology to the learning process may offer little value. Rather, technology needs to be properly integrated into platforms and processes that enhance student learning.

Storytelling as a Pedagogical Tool

Storytelling is an effective means of imparting knowledge, beliefs and traditions. In its multimedia form, digital storytelling has been made popular by the digital storytelling movement led by the Center for Digital Storytelling (www.storycenter.org) since the late 1980s. While digital storytelling has existed for several decades, its use in education has only been explored recently (Holtzblatt and Tschakert, 2011; Sylvester and Greenidge, 2009). Digital storytelling can be represented in many different forms. For example, instructor-created stories may revolve around familiar experiences and events that are relevant to students; instructional materials that rely heavily on voice narration; documentary videos detailing a recount of historical events; or student-led productions which enable users to create their own stories and share their developments with others (Oppermann, 2007).

Digital storytelling harnesses the power of audiovisuals to engage students' visual and auditory senses in ways that printed textbooks can never accomplish. The combination of text, image and audio motivates students to engage in deep learning (Pounsford, 2007), something which is far from surprising given the extent to which today's students are familiar with this form of interaction. A recent Cisco report (2010) predicts that Internet videos, as a proportion of consumer Internet traffic, will increase from 40% to 62% by 2015. Today's students make extensive use of the Internet, are familiar with and use various forms of social media such as blogs, podcasts and social networking tools (Robin, 2008), and are accustomed to watching YouTube videos, TV series or episodes online.

Digital storytelling may play the role of an effective platform that makes abstract content more accessible and facilitates discussions about topics in the story, hence engaging a large group of students (Pounsford, 2007). This is possible since students are more willing to listen actively and relate the story to their own experiences and perspectives. As a result, the process attracts students to participate, be engaged, and better learn the concepts (Miley, 2009). Digital stories, especially student-led productions, demand a prerequisite level of understanding about the topic at hand. This will prompt students to engage in reflective learning and deeper thought processes as they personalize their experience and communicate their ideas with peers (Sandars, Murray and Pellow, 2008; Dillard and Reynolds, 2010; Warren, 2004). Also, showcasing student-led productions may capture the attention of the class and help instructors gain credibility and support, a vital connector in the classroom (Robin, 2008).

In the context of accounting education, digital storytelling may enhance students' technical competence in accounting through sustaining the level of interest in the subject (Crumbley and Smith, 2000). Digital storytelling is an amalgamation of education and entertainment with an element of adventure. Thus, digital storytelling makes seemingly stand-alone technical topics more meaningful and easier to learn. As a result, it helps to overcome boredom and act as a hook to capture students' interest in the subject matter (Suwardy, 2008; Tsou, Wang and Tzeng, 2006). In addition, stories provide simulated business contexts and hence give students an opportunity to connect accounting theories to practice in a meaningful way (Sadik, 2008). Furthermore, these stories act as a framework to demonstrate the connections between various accounting concepts, events and entities, providing students with a better overview of the contextual relationships between accounting, business and society (Crumbley and Smith, 2000).

Overall, successful storytelling goes beyond engaging students: it inspires less enthusiastic and less motivated students. The pedagogy works by evoking the student's emotional engagement with the topic, where the student actively connects stories to the theories at hand (Oppermann, 2007). The impact of digital storytelling can be summarized as a convergence of four student-centred learning strategies: student engagement; reflection for deep learning; project-based learning; and the effective integration of technology into instruction (Sadik, 2008). This employment of creativity and deeper thought creates a stronger sense of purpose in learning (Hull and Katz, 2006).

Our Digital Story

The innovation described in this paper was undertaken at Singapore Management University and involved incorporating digital storytelling into the introductory financial accounting course. The course is a compulsory element of many of the university's undergraduate degree programs. The students are full-time school leavers aged between 18 and 20 and the course is typically taken during their first year at the university.

The Story and Objectives

The original script for the digital story was a storybook written by Mark Beasley and Frank Buckless (2002), entitled *Movie-Door-2-Door.Com*. Permission was obtained from the publisher to localize and convert it into a digital format for use by students of Singapore Management University. We used the same company setting and title in our digital story, hereafter referred to as MD2D.

The story revolves around the lives of three young graduates who embark on a business venture together. It chronicles the progress of their entrepreneurial endeavors: they conduct market research, formulate a business plan, and consider different ways to finance and start their business. In the process, they learn how accounting information is important for making business decisions.

This is not the sequence which would normally be found in accounting textbooks. The digital story is intended to complement traditional classroom lessons. MD2D is not used to teach the technical aspects of accounting, such as how to set up accounts, perform bank reconciliation, depreciate long-term assets and conduct budgeting or break-even analysis. These topics are taught in the theoretical component of the course, using typical accounting textbooks, supplemented by relevant accounting cases. The objective of the innovation was to use the MD2D story to show students why these procedures are needed in a business operation, allowing them to experience the context of the things we teach in class.

Like many business ventures among friends, occasional conflicts happen and the business has its ups and downs. Interpersonal relationships, including romance between partners, may also help or jeopardize the business. As much as we could, the original script was adapted so as to be realistic and suitable for the student audience.

In total, 12 episodes (average play length of 20 minutes each) were written, to match the 12-week term structure. The titles of the 12 episodes were: (1) They Started as Friends, (2) Counting the Costs, (3) Starting the Business, (4) Light, Camera, Action!, (5) Rental at Last!, (6) Becoming the Boss, (7) The Celebration, (8) The Crash, (9) Taking a Bank Loan, (10) Tapping the Market, (11) The Negotiations Begin, and (12) Moving Ahead. These episodes tell a story spanning around two years. (See Appendix 1 for a synopsis of each episode.)

Development

The original MD2D story was 'storyboarded' (Figure 1).[1] Contextual adaptations were made based on cultural and society norms appropriate for the local settings.

Casting calls were made on campus for the three main protagonists, Brad, Courtney and John, as well as a number of extras. In total, over 15 students and two university staff were selected for the project. Having younger cast members acting as 'new graduates starting out a business' was considered beneficial, as students would be likely to view the characters as being people with whom they could relate, as opposed to older characters with whom they could not. The digital story was shot around the city campus, allowing the inclusion of a number of facilities and locations that would be familiar to the students.

One key development decision was not to film the digital story with live action, monologues and sound effects. Live filming would have required actual acting and the memorizing and delivery of lines, as well as significant post-production inputs. Instead, we decided on a 'stop-motion' approach, where a series of still pictures played as a continuous sequence to create an illusion of movement. Speech bubbles were then added post-production (see Figure 2). Students commented that the end results had an 'anime' (a popular Japanese word for animated comic book) feel, another characteristic of the approach to which they could relate.

The adaptation, storyboarding, photography and post-production works (including audio narration) took a total of two years to complete. The university's teaching and learning unit sponsored the project and paid a total of SG$30,000 (about US$20,000) to the multimedia developer, student actors and actresses, voice artist, and other incidental expenses. Faculty's time and effort, as is typical in many pedagogical projects, were not separately compensated.

Each episode was designed to comply with the SCORM (Shareable Content Object Reference Model) for deployment in the university's Learning Management System (LMS), originally *Blackboard Vista* and subsequently *Desire2Learn*.

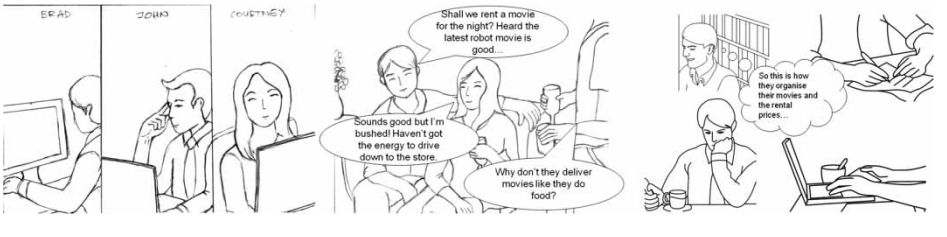

Figure 1. Storyboarding

Figure 2. Stop motion video with post-production speech bubbles

Implementation

By deploying the story through the university LMS, we were able to program the automatic release of each episode at the start of each teaching week. This was an important element in the delivery of the digital story. We wanted students to have a week (between episodes) of not knowing what would happen next. Often students are too anxious to find out answers to problems, to see if a new solution will work out as expected immediately. In a real business, entrepreneurs often face many unknowns, needing time to execute business plans, and needing even more time to consider and react to the results of such plans.

The digital story interface was designed to allow students to pause and interact with the story at predetermined points. Students could either listen to the voiceover narration or read the text on screen (see Figure 3).

There were a total of over 50 questions built into the story to help the students think about the issues shown on screen (see Figure 4). (Examples from each week's episode are shown in Appendix 2.) The questions formed the basis of weekly discussions, either conducted in class or via the online discussion forums in the LMS. Our experience taught us that in-class discussions were more effective and ensured continued interest in the story. Each week, we would spend 15 minutes at the start of each class talking about the episode released in the preceding week. This offered the added benefit of building good rapport with the freshmen students and eased them into the university's pedagogy, which favors classroom discussion and participation.

Findings and Discussion

The University's teaching and learning unit surveys students on all projects it funds. Consequently, after the MD2D was deployed and the course had been completed, the unit

Figure 3. Sample MD2D screenshots

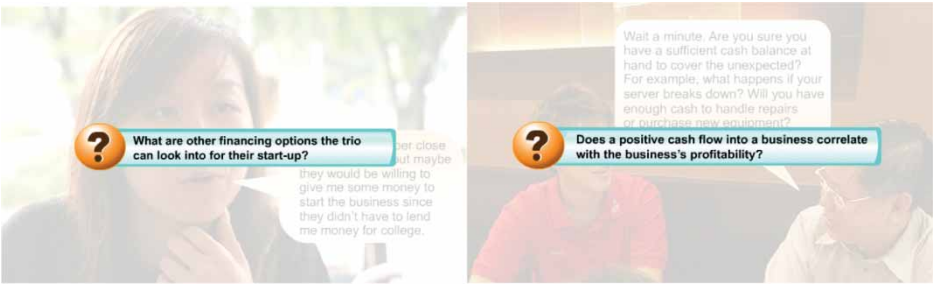

Figure 4. Sample discussion points in the storyline

conducted an online survey to evaluate the project. Participation in the survey was voluntary. Of the 74 students, 34 responses were received, representing a response rate of 46%. As no other data was collected, we were unable to conduct any statistical analysis beyond reporting a summary of descriptive statistics, as provided to us by the teaching and learning unit (see Table 1).

Many of the respondents also provided qualitative feedback. They wrote about how MD2D enabled an interesting, fun, engaging, interactive and dynamic way of learning. They appreciated the opportunity to contextualize the technical content of the course in a business venture. Selected student comments summarized by the teaching and learning unit included:

> I feel that the topics taught were all relevant and interesting, maybe MD2D could be introduced to the other classes for learning as well because I feel it's rather enjoyable to learn accounting concepts via videos.

> Having students watch MD2D and answer a question [. . .] is an interesting way for us to be actively involved in the course.

Table 1. Student feedback on MD2D

	Questions (1 = strongly agree to 5 = strongly disagree)	Mean	Standard deviation
1	Your experience with this digital storytelling has helped you to understand the topic(s) better.	2.18	0.72
2	This digital storytelling has provided the necessary context and information for you to discover the factors contributing to the issues and problems.	1.85	0.56
3	This digital storytelling has provided the necessary context and information for you to evaluate the consequences of different decisions.	1.91	0.45
4	The follow-up discussions with your classmates or instructor encourage you to see the issue(s) from new angles.	1.71	0.72
5	This digital storytelling has provided authentic scenarios for open-ended discussions.	1.91	0.57
6	This digital storytelling has provided opportunities for decision making.	2.09	0.57
7	This digital storytelling has provided meaningful feedback to your decisions.	2.27	0.55
8	This digital storytelling has clear presentations.	1.97	0.58
9	This digital storytelling used media approximately (e.g. videos, animations, web applications, etc.)	1.94	0.55

> I liked the MD2D episodes and animation very much as it was a refreshing way of learning.
>
> Many applications to real life situations were discussed during the course. It made this course more relevant and meaningful. I also enjoyed the MD2D episodes. It made learning more interactive.
>
> The fact that Prof has used the MD2D movies to enhance our learning process is great and it helps us understand how the accounting processes and business actually work in the outside world and also helps to understand how the concepts we learned through the text can be applied in real life.
>
> I think that MD2D is quite good, even though I complained of how the story is lame. It is so much easier to relate to accounting numbers when you put stories together with them.
>
> Highly interactive and it does not start like the usual lectures which dive straight into course material. I like the way Prof goes out to engage us with questions from MD2D.

The survey results also indicated that students were positive about the instructional design of the digital storytelling tool. They felt that digital storytelling was able to provide open-ended discussions, opportunities for decision-making and meaningful feedback. A large majority of the respondents (28 out of 34) also expressed the wish for more of such digital stories in future.

We found that students were able to discover the factors contributing to the problems in the digital story and evaluate the consequences of different decisions. Digital storytelling also stimulated a significant level of student discussions on the course's online discussion forum. Furthermore, several pop-up discussion questions that served as starting points for discussion in each class were well-received by students. These students indicated that the follow-up discussions that are linked to the stories had encouraged them to re-examine the issues from a new perspective. The discussion activities had certainly allowed students to be more engaged and interested in the digital storytelling tool.

The student feedback corroborates findings of prior studies that digital storytelling has the potential to be a valuable pedagogical tool. For example, Holtzblatt and Tschakert (2011, p. 359) used video to teach international financial reporting standards and stated that video helped 'to involve and engage students'. Tsou, Wang and Tzeng (2006) used digital storytelling to teach foreign languages. According to Tsou and his co-authors, students in the digital storytelling experimental group have a higher enjoyment of and success in language learning compared to students in the control group, who did not have access to digital storytelling.

Prior studies also support the deployment of digital storytelling in the classroom. Robin (2008, p. 222) argued that digital storytelling 'can be particularly helpful not only in engaging students in the content but also in facilitating discussion about the topics presented in a story and helping make abstract or conceptual content more understandable'. A study of Egyptian teachers revealed that the teachers were willing to include digital storytelling in their curriculum (Sadik, 2008). The Egyptian teachers believed that 'digital storytelling enriched the classroom learning environment, the curriculum, and student learning experiences by providing an open-ended, creative and motivating productive tool in the classroom' (Sadik, 2008, p. 502).

Conclusion

This article described how a multimedia digital storytelling tool was used as a means of engaging student learning in a first-year introductory financial accounting course. The

digital storytelling tool was introduced in an attempt to connect and complement theories and cases so as to assist students to learn better. Theories are what students learn in textbooks, while cases are examples of how the theories are applied in the business world. Stories provide the contextual, real-life scenarios of how things may work in real life. The results of an independent survey conducted by the University's teaching unit supported the effectiveness of digital storytelling in helping students to understand financial accounting concepts and contextualize accounting's role in management decision-making. Thus, digital storytelling, as a pedagogical tool, can engage students' visual and auditory senses in a way that written words alone cannot.

Future research can examine the effectiveness of digital storytelling in other accounting courses besides financial accounting. It will be interesting to see if the simulated business contexts in the stories could also stimulate students' interest and allow them to better connect taxation and audit concepts to practice in a meaningful way. Further research may also examine the utility of the digital storytelling approach against alternative teaching and learning interventions. While digital storytelling is an effective tool for engaging student learning, it would be interesting to discover whether it is also cost efficient when compared with other teaching and learning approaches.

Note

[1]A storyboard is defined as 'a panel or series of panels on which a set of sketches is arranged depicting consecutively the important changes of scene and action in a series of shots (as for a film, television show, or commercial)' (Merriam Webster Online Dictionary: www.merriam-webster.com/dictionary/storyboard).

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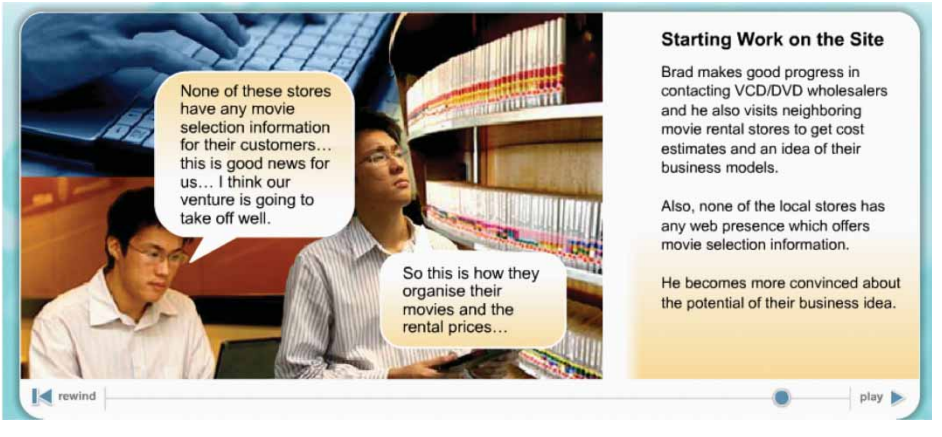
Appendix 1. Episode Synopsis

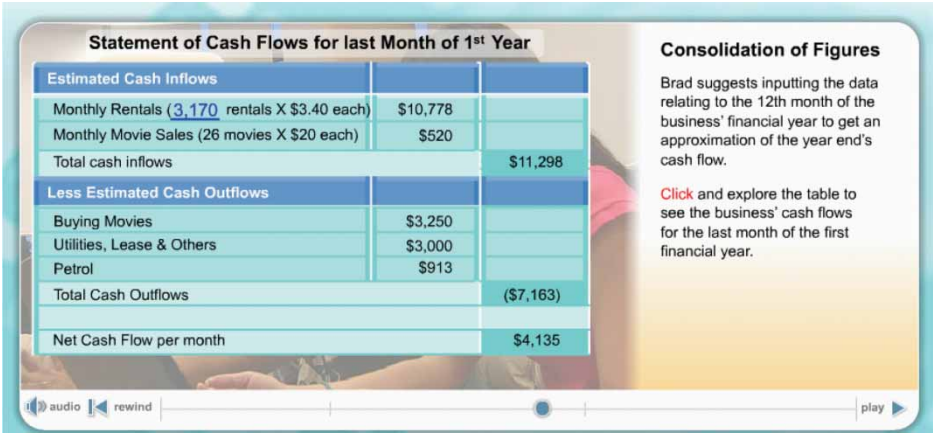
Episode 1. They Started as Friends

Courtney, Brad and John were school friends who worked in the same company after graduation. They had a business idea, running a video rental business with delivery services and online capabilities. Brad started to research about the video rental business, including contacting distributors and wholesalers, surveying other video rental shops, exploring various movie-related websites, etc.



Episode 2. Counting the Costs

Three months after they first brainstorm about the business, Courtney, Brad and John were ready with some prototype websites for their video business. They pored through their cost estimates (including initial stock of movies), delivery plan, equipment needs, other monthly operating expenses, rental fees structure, and expected business volume. For their first year of operation, they projected net cash inflows of $4135 per month and they were excited about their prospects!



Episode 3. Starting the Business

The trio finalized their business plan and approached their parents as potential sources of funding. Brad's father, a businessman, was supportive but cautioned that they will need some cash reserve in case things do not go according to plan. John convinced his mum to take a share of the business. Courtney's parents agreed to lend the business money in return for interests. Together, they pooled a total of $54,000 cash for their business. They also allocated an equal amount of shares to themselves as 'sweat equity'.

Episode 4. Lights, Camera, Action!

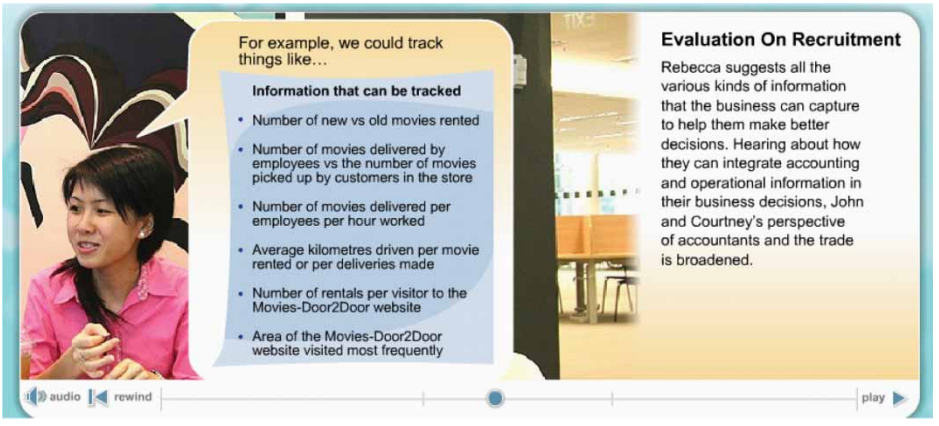
The partners met with an accountant and a lawyer to get their business registered and set up. They secured a lease for the shop and were busy setting it up, including more features for their website. John started keeping track of the business expenditures (dumping them in a shoebox!); when he started processing them, he could not remember what they were for and categorized them as best as he could remember. They were surprised to see how much they had spent! They decided that the categories were not adequate and John begrudgingly redid all the accounts with better expenditure categories. They also agreed to use an 'expenditure cover sheet' to accompany each receipt.

Episode 5. Rentals at Last!

Finally, MD2D is open for business! John, Courtney and Brad took turns staying at the shop and doing the delivery rounds for the movies. As the business grows, Courtney spent more and more time processing cash, cheques and credit card payments from customers. Brad and John themselves were overwhelmed and were behind in ordering new movies. The three argued over discrepancies between their cash records and the bank statement.

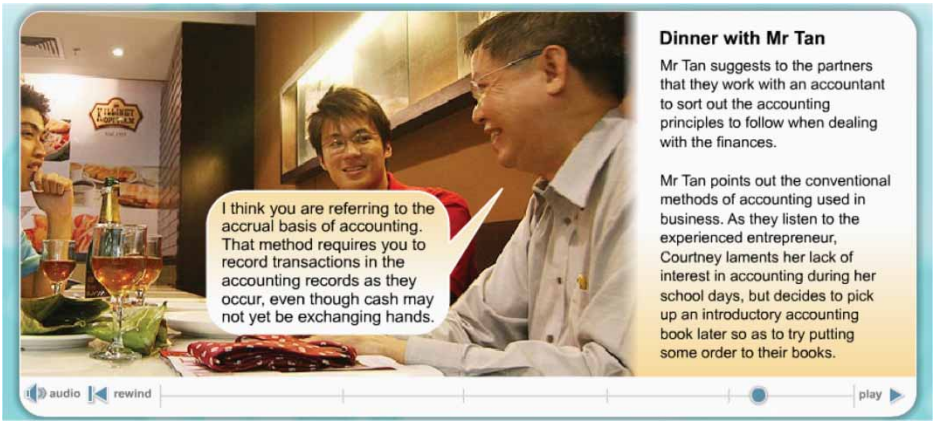
Episode 6. Becoming the BOSS

Courtney's relationship with John has deteriorated. They argued over small things. Brad supports Courtney's idea to hire someone to help with the movie deliveries. Ben was subsequently hired and over the next few weeks proved to be really helpful to ease their delivery workload. Courtney and John met Rebecca to discuss matters related to staff on-costs and additional business information that would help them run their business better. In hindsight, John agreed that having an accountant's input in their early planning stage would have been very beneficial.



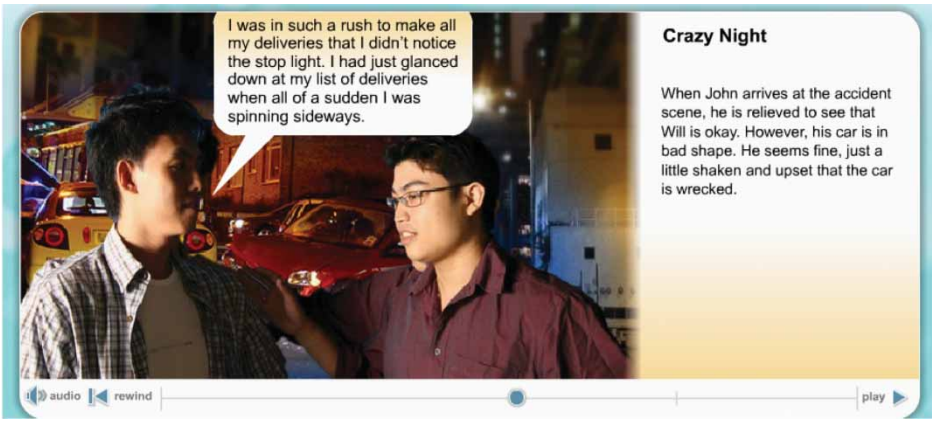
Episode 7. The Celebration

Brad's father flew in from Hong Kong and was impressed with how much hard work the trio had put into the business (and envious of their energy level!). At the dinner, Mr. Tan reminded the group that not having paid for expenditures does not mean that the business is making money. Afterwards, they decided that they need accounting software. They realized they needed to track their assets and liabilities, instead of just cash inflows and outflows. At their workplace, John was tasked to lead a major project that required him to travel out of Singapore over the next few months.



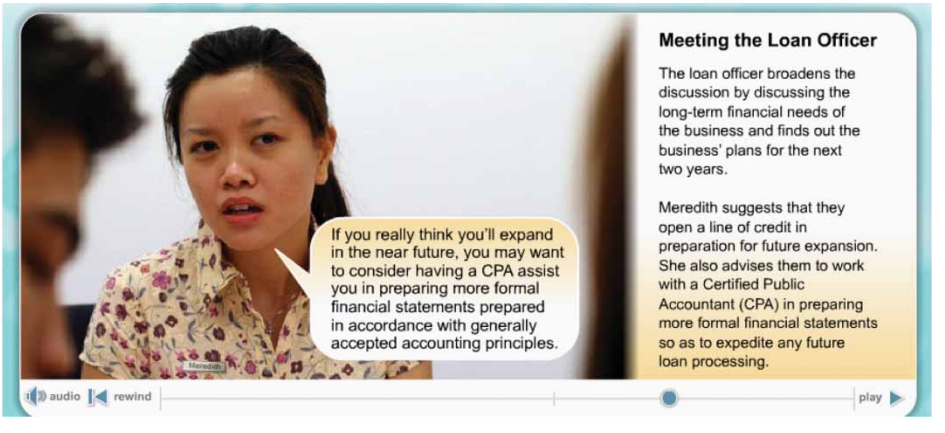
Episode 8. The Crash

For the first time, all three will be away from the shop. John and Courtney decided to take a much-deserved holiday to Tokyo, and Brad was due to be in Malaysia again soon. On the night before they are due to leave, John and Courtney were in for a stormy and hectic night. Orders were piling in and their server was slowing down and customers were complaining. One assistant called in sick, and another just had an accident! Courtney and John worked throughout the night to troubleshoot their server failure. They had to cancel their trip, and started to worry about how they could afford a new server.



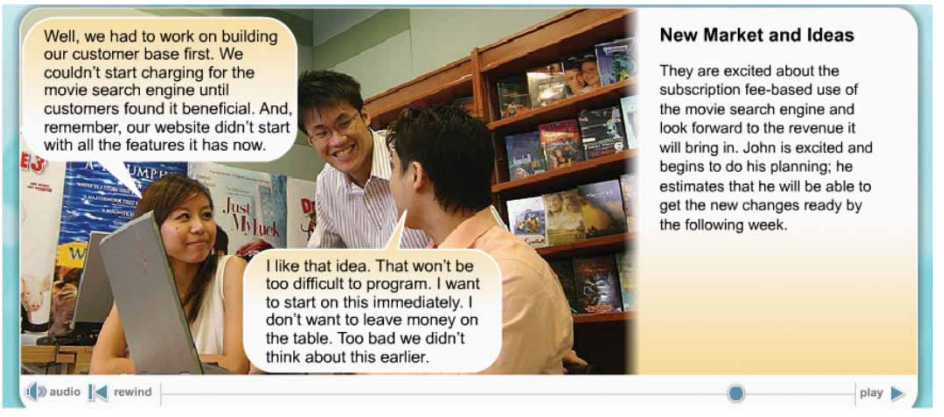
Episode 9. Taking a Bank Loan

John and Courtney went to a bank to speak to a loan officer about getting credit for purchasing the new server. Meredith, the bank officer, asked about their business and financial statements. She explained why the bank needs such detailed information before lending them money. John and Courtney went through their business records and thought about their assets, liabilities and equity. They discussed the appropriate measurement amounts for their assets. Eventually, the bank agreed to lend the business the money for the new server.



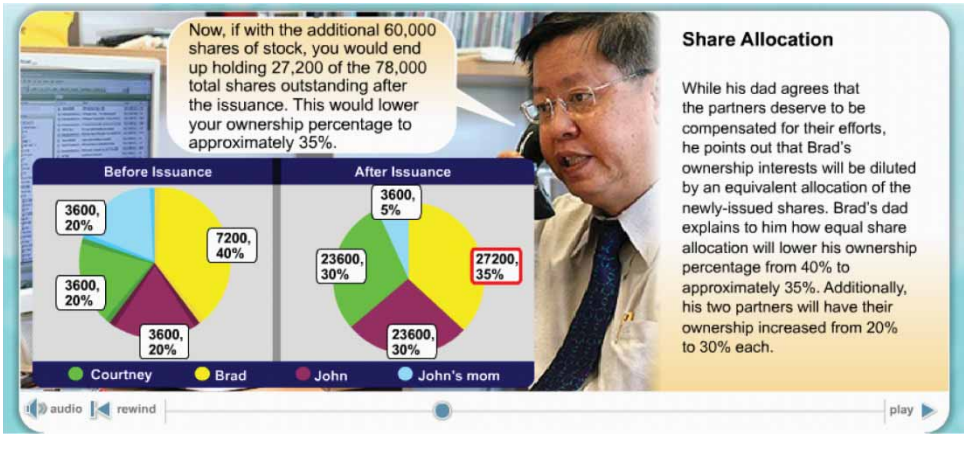
Episode 10. Tapping the Market

Brad's client in Malaysia was very impressed with his work and offered him a very lucrative position. He was very tempted, as he would also get to spend more time with his girlfriend, Maggie. Back in Singapore, John and Brad set up their new server and instituted a new registration process. To their surprise, they had over 50,000 registered users within weeks. Many of these customers actually never rented movies from MD2D but used its website for movie recommendations and reviews. The partners thought about a new idea, where customers will only be able to access certain features of the website if they subscribe as a paying member.



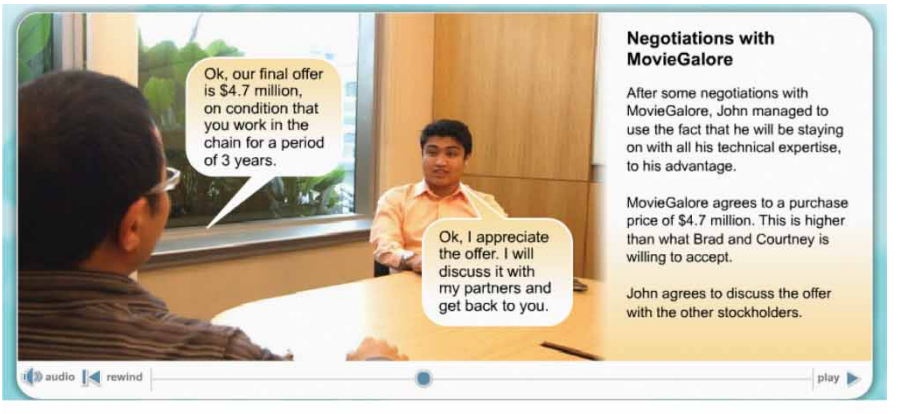
Episode 11. The Negotiations Begin

With the security of a large cash balance from customer subscription prepayments, the partners agreed to work full-time at MD2D. The partners also planned on opening new stores, and focused their attention on growing their subscription base and website features. John had become very engrossed with programming their new features for the website. They also made money from advertisement placement on their websites. A movie rental chain, Movie Galore, approached the group with a buyout offer. They wanted to purchase their business, especially their software, to complement their video rental stores island-wide. After almost three years in the business, Brad and Courtney were tempted to pursue other interests, but John was adamant that the business had much more potential and didn't want to give it up. They also had major arguments about issuance of additional stock. Courtney eventually voted with Brad, and John was unhappy.



Episode 12. Moving Ahead

As part of the negotiations, Movie Galore asked their auditors to conduct due diligence on MD2D's accounting records. John tried to explain how he did the accounting and the auditor pointed out inconsistencies and questioned his estimated useful life for MD2D's assets. A buyout price of $5.5 million was offered as long as the trio would work for Movie Galore for three years. Courtney and Brad were not interested and suggested that John discussed a buyout offer without them continuing with the business. Eventually, a buyout of $4.7 million was agreed upon. All investors agreed to the final offer, including John's mum. As they walked out after signing the legal documents, the partners parted ways… (with alternate endings).



Appendix 2. Sample Discussion Questions

Throughout the MD2D digital story, we built in over 50 pop-up discussion questions that would give the students an opportunity to think and reflect about the events and decisions taken by John, Courtney and Brad. These questions serve as a starting point for discussions in each class but are not necessarily addressed one by one. A sample of the questions from each week is provided below.

Ep01	• Do you think there is a scope for a movie delivery business in Singapore?
Ep02	• What are other financing options the trio can look into for their start-up?
	• Is it realistic to expect to break even or profit within the first year of a start-up? Are there any expenses or sources of revenue that the trio missed out in their initial plan?
Ep03	• How much of a cash reserve do you think will be necessary for a start-up? Do you think the trio has provided enough to see their plan through the first year of operation?
	• How is raising funds from stock issuance different from borrowing money?
	• How would you determine the value of the effort and time spent in setting up a start-up?
Ep04	• Why does it make sense to require two signatures on every cheque issued?
	• Will using personal financial management software be adequate for a business to keep track of its finances?
	• Is there anything you would add to John's Expenditure Cover Sheet? What are the benefits of using such a cover sheet?
Ep05	• How frequent do you think accounting records and financial statements need to be prepared?
	• What are the items that may cause discrepancies between the recorded cash balance in the books and the cash balance reported by a bank statement?
Ep06	• How can one measure the costs and benefits of hiring an additional employee? Do you think MD2D has made the right decision at this stage of their venture to hire Ben?
	• How does working with an accountant when designing a company's information system help to boost the business?
Ep07	• Does a positive cash flow into a business correlate with the business's profitability?
	• What are the consequences of not adjusting business records to conform to generally-accepted accounting principles?
	• When do you think a liability should be recorded for movie purchases: when they are ordered, delivered or billed?
Ep08	• Do you think they have to put in place alternative internal control procedures now that all three will be away at the same time?
	• How will the business be affected by this car accident? How much responsibility does the company have to bear in this accident?
Ep09	• What should the partners consider before deciding on the lease or loan option?
	• Why does the bank require such detailed information regarding the business to process the loan?
	• What other methods are available to calculate average monthly costs for a business? How would you balance the need for accurate and relevant information with timeliness?
Ep10	• What should the partners do to avoid this risk?
	• What other risks have the partners not considered when it comes to safeguarding the business?
Ep11	• What are the strategies that the partners can adopt to increase their subscriber base?
	• Whose viewpoint regarding the buyout of the business do you agree with more?
	• Do you agree with John's analysis of the unequal share allocation?
Ep12	• So what will happen between John, Courtney and Brad?

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