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USING ONLINE TUTORIALS TO TEACH THE ACCOUNTING CYCLE

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USING ONLINE TUTORIALS TO TEACH THE ACCOUNTING CYCLE

ABSTRACT

The accounting cycle is an important yet difficult topic for introductory financial accounting students to learn. These students often lack the business context to understand the accounting cycle and find the traditional teaching approach dry. This problem motivates the authors to examine whether a blended learning approach via online tutorials can improve students' perceived knowledge of the accounting cycle for the undergraduate introductory financial accounting course. The authors developed four innovative online tutorials with a coherent storyline to enable students to learn the accounting cycle and to supplement in-class learning. To test the effectiveness of online tutorials, an independent survey was conducted by the Centre of Teaching Excellence at the authors' University. The survey results suggest that the accounting cycle online tutorials substantially improve students' perceived knowledge of the topic (an increase of 59.8% in the perceived knowledge) and the improvement is statistically significant. Meanwhile, the results indicate that the online tutorials are valued by students for the enjoyable learning experience. Students credited the online tutorials for increasing their interest in the course and providing the business context to understand the accounting cycle, which enhanced their learning. Given the positive impact reported by students, the paper recommends instructors for introductory financial accounting course to use these accounting cycle online tutorials to supplement in-class learning as there is only minimum cost of implementation. One caveat of the paper is that students' perceived knowledge may not reflect the actual knowledge of the accounting cycle.

Keywords: *accounting cycle, introductory financial accounting, online tutorial, e-learning, blended learning*

1. INTRODUCTION

The accounting cycle is an important, yet difficult concept for introductory financial accounting students to learn. It's important because students who understand the accounting cycle well would have a stronger foundation to perform better in the introductory course (even higher-level courses). On the other hand, students enrolled in the introductory financial accounting often lack the business context to understand the accounting cycle and find the traditional teaching approach dry. This problem motivates the authors to search technology enhanced learning solution as the literature shows effective use of technology can be incorporated to enhance accounting education (Apostolou et al., 2011; Wessels, 2010). Online tutorials and blended learning approach are considered suitable solutions for this problem as prior studies find online tutorials are more effective for introductory accounting courses than advanced courses. Chen et al. (2013) found that for advanced accounting courses, the learning outcomes were significantly more favorable for traditional face-to-face classroom environments than for online learning. Students in advanced accounting courses perceived a need for more in-class time than those in introductory level courses.

In this study, we examine whether online tutorials can improve students' perceived knowledge of the accounting cycle for an undergraduate introductory financial accounting course. Given the benefits of online tutorial documented by prior studies (Cheng and Swanson, 2011; Sargent et al, 2011; Gavira and Omoteso, 2013), online tutorials may be able to improve students' perceived knowledge of the accounting cycle by leveraging technology to enable effective learning. On the other hand, to the extent that the content of the online tutorials overlaps with existing learning materials (lesson notes and books), there may not be any improvement of students' perceived knowledge. Furthermore, the accounting cycle is a basic topic

and students with prior accounting background may already understand it well. Hence these students may not benefit from the online tutorials significantly.

The authors developed four online tutorials with a coherent storyline to enable students to learn the accounting cycle outside the classroom. The goal is to improve students' learning experience and learning outcome, and to supplement in-class learning, books and other written materials. The four online tutorials are part of a self-study package and serve as a supplement to the face-to-face classes. Students are encouraged to complete the online tutorials before classes in order to be better prepared in classes. Students can also refer to the online tutorials after classes for revision purposes.

To test our hypothesis, an independent survey was conducted by the Centre of Teaching Excellence from the authors' University. The survey results suggest that the accounting cycle online tutorials significantly improve students' perceived knowledge of the topic. There is an increase of 59.8% in students' perceived knowledge of the accounting cycle after using the online tutorials –specifically, students' perceived knowledge of the topic increases from 3.19 to 5.1 (on a scale of 7) due to the online tutorials. Results were separately analysed for two student groups. As expected, the impact of the online tutorials is more salient for students without prior accounting background ($M_{increase}$ = 2.61) than students with account background ($M_{increase}$ = 1.07). Meanwhile, even for students who have prior accounting background, the improvement of perceived knowledge of accounting cycle is statistically significant. These results are consistent with the notion that the online tutorials can effectively improve learning of the topic for students of various backgrounds in an introductory course.

In addition to improving the perceived knowledge of the accounting cycle, the results also indicate that students value the online tutorials for the enjoyable learning experience. Students credited the online tutorials for increasing their interest in the course and providing the business context to understand the accounting cycle,

which contribute to more effective learning. Overall, students strongly endorsed the future use of the accounting cycle online tutorials for an introductory financial accounting course.

One caveat of this paper is that there are limitations associated with self-perceived measures of learning and knowledge. Students' self-perceived knowledge may not reflect the *actual* knowledge of the accounting cycle. Second, in this study, there is no control sample where students do not receive the online tutorials for a difference-in-difference test[1]. Lastly, it should be highlighted that the benefits of accounting cycle online tutorials do not necessarily apply to other courses. We don't expect the results to generalize to upper-level accounting courses because students already possess a more sophisticated understanding of the accounting cycle.

As there is only minimum cost of implementation the accounting cycle online tutorials, the results of this paper suggest it is beneficial for instructors of introductory financial accounting course to implement these tutorials to supplement in-class learning to improve students' learning outcome and experience[2]. However, interested instructors need be aware of certain disadvantages associated with online tutorials. There may be some loss of flexibility as it's not easy to adjust online tutorials in reaction to students learning behavior.

We organize the remainder of the paper as follows. In section 2, we discuss our hypothesis and the benefits of online tutorials. In section 3, we describe the accounting cycle online tutorials and implementation guide. Section 4, we present test results and students' feedback.

2. HYPOTHESIS DEVELOPMENT

For an introductory financial accounting course, the most fundamental topic is the accounting cycle. However, many students find this topic dry and difficult to

[1] For fairness, the authors decide to give the online tutorials to all students enrolled in the course.
[2] Interested instructors can contact the authors to implement the accounting cycle online tutorials.

internalize because they lack the business context to understand. Given the benefits of online tutorials documented in prior studies, we examine whether online tutorials can help solve this problem and improve the leaning outcome of the accounting cycle. Specifically, we examine whether the accounting cycle online tutorials can improve students' perceived knowledge of the topic.

The use of online tutorials is an increasingly common phenomenon as instructors adopt a blended learning approach (Hiralaal, 2012; Khanlarian and Singh, 2014; Seow and Pan, 2017; Wong, 2012). Online tutorials facilitate the learning of materials before classes and enable students to better prepare for classes. It also allows students to learn outside the classroom at their own pace. Sargent et al. (2011) argued that students appreciated the 24/7 convenience of online tutorials. Sargent et al. (2011) also commented that the benefits were greater for weaker students as they often do not seek help and the online tutorials offer them repeated views as needed without stigma and without having to ask for help. Cheng and Swanson (2011) also argued that online learning provided access to students without time and place restrictions, which helps them to learn outside the classroom. Gavira and Omoteso (2013) commented that accounting students viewed online learning favorably and using computerized tutorial systems result in positive learning experiences.

Studies have demonstrated that online learning helps students in their learning and improves their academic performance (Baxter and Thibodeau, 2011; Cheng and Swanson, 2011; Sargent et al., 2001; Seow and Pan, 2017; Suwardy et al. (2013). Baxter and Thibodeau (2011) found that students who used the online software performed significantly better than those who had not on the exams that tested the underlying financial accounting material. Cheng and Swanson (2011) found that students who used online tutorials improved their learning outcomes by 12 per cent compared to those who used traditional text-based resources. Sargent et al., (2011) found that online tutorials for principles of accounting courses

increases students' motivation to learn and result in significantly lower course drop rates and better pass rates. Seow and Pan (2017) implemented an online tutorial to teach data modeling in an Accounting Information Systems course and found a significant increase in students' perceived knowledge of data modeling after using the online tutorial compared to their knowledge prior to using the tutorial. Suwardy et al. (2013) demonstrated that digital storytelling tutorials make abstract content more accessible and facilitates discussions about topics in the story, hence engaging students.

On the other hand, online tutorials could be ineffective for improving knowledge of accounting cycle for several reasons. First, the online tutorials content may overlap with other learning materials such as lesson notes, PowerPoint slides and textbooks, thus the online tutorial may not be able to significantly improve the learning outcome. Second, students with prior accounting background may already understand the accounting cycle well as this is a fundamental and basic topic. Hence these students may not benefit from the online tutorials significantly.

These arguments lead to our hypothesis:

Hypothesis: *Students' perceived knowledge of the accounting cycle is higher after using the online tutorial than before using the tutorials.*

3. THE ONLINE TUTORIALS AND IMPLEMENTATION

We developed four online tutorials to guide undergraduate students through the whole accounting cycle in the first Financial Accounting course.

Scope and Learning Objectives

The four online tutorials, accessible at https://smu.sg/aclo (see appendix for selected screenshots in figures 1 to 7) enable students to go through the whole accounting cycle, from analysis of transactions to preparation of financial

statements. The whole accounting cycle is divided 9 steps and covered in each of the four tutorials as follows:

1. First tutorial: Introduction of the five elements of accounting – Assets, Liabilities, Shareholders' Equity, Income and Expenses, the accounting equation and the standard financial reports.
2. Second tutorial: Steps 1 – 3 of the accounting cycle – analysis of transactions, journal entries and posting entries.
3. Third tutorial: Steps 4 – 6 of the accounting cycle – preparation of the unadjusted trial balance, the four types of adjusting entries, preparation of the adjusted trial balance.
4. Fourth tutorial: Steps 7 – 9 of the accounting cycle – preparation of the financial statements – Income Statement, Statement of changes in Shareholders' Equity and Statement of Financial Position, as well as closing entries and post-closing trial balance.

The learning objectives of these four online tutorials include: (i) students understanding business and accounting terminologies, (ii) students understanding what business transactions are, and (iii) students knowing how to record transactions and how to prepare accounting information for external users.

Intended Audience and Time Requirement

These online tutorials are assigned as part of an undergraduate foundational Financial Accounting course. The students are aged between 19 to 22 years old. The foundational Financial Accounting course is taken during the first year at the university. Each tutorial is self-paced and can be completed in as short as 5 minutes, depending on the level of understanding that each student has, or for as long as is necessary for the students to grasp and understand the concepts.

Attractiveness of the online tutorials for a new generation of learners

A common thread across the four tutorials is the use of the same business entity. Students follow the owner as the business owner starts his air-conditioner cleaning company, sources for loan, advertises for business prospects, gets his supplies and performs his services for customers. The use of a lighthearted style of a video blog (known as Vlog, see figure 5 in the appendix) to feature the budding entrepreneur and an accompanying tablet at the side to track transactions allows students to better visualize how accounting is being used in businesses without first introducing technical jargons.

The online tutorials have interactive components whereby the students are shown a few examples on how to analyze transactions, do adjusting entries, or prepare financial reports and they will complete the rest on their own (see figures 6 and 7 in the appendix). Immediate feedback is provided as to the correctness of their work. The tutorials are broken up into smaller bite-size segments and students can go back to refresh their memories on particular segments. There are also pop-up reminders of definitions, adjusted trial balance, financial statements as students progress further on into the tutorials. This will eliminate the need to go back to the earlier segments and is less disruptive to the whole learning experience.

These online tutorials are scenario-based, interactive and animated so that students can have a pleasant and fun learning experience while acquiring adequate pre-lecture understanding before they come for lessons.

Implementation Guidance

Students should be required to go through these four online tutorials before each corresponding lecture. However, there is no stopping them to revisit the online tutorials throughout the semester for revision purposes.

As with any implementation of Technology-Enhanced Learning initiatives such as online tutorials to complement face-to-face lectures, there are challenges

that instructors face – (1) motivating students to be self-directed as well as (2) getting students to see the relevance of the online tutorials to actual lecture content.

To address these challenges, the instructors can use the examples in the online tutorials during the face-to-face classes and draw relevant points of discussion. Furthermore, the instructors can do short verbal or written quizzes of the online tutorials content during the face-to-face classes.

The authors' university has a learning management system whereby it is possible to track the students' learning via backend analytics. Instructors can analyze information such as the duration spent on each online tutorial. Participation marks can be given to students who have completed every online tutorial before the start of the related lectures.

4. FINDINGS AND DISCUSSION

To test our hypothesis on whether online tutorials can improve perceived knowledge of the account cycle, a questionnaire was developed by the authors and independently administered by the University's Centre for Teaching Excellence (CTE). The survey was administered to all students who were enrolled in the introductory Financial Accounting course in Term 1 of Academic Year 2017/2018 (August to December 2017). A total of 167 students voluntarily participated in the survey.

Student Profile - Prior Accounting Background

Students were asked to indicate whether they had prior accounting background (e.g. completed accounting courses from previous education). We expect the online tutorials to be more useful to students without prior accounting background in terms of enhancing their understanding of accounting cycle. Meanwhile, for students with prior accounting background, ex ante it is not clear

whether the online tutorials can further improve their knowledge of the topic. Slightly less half of the students (45%, n=75) have accounting background prior to taking this introductory accounting course while the remaining students (55%, n=92) have no background.

Perceived Knowledge of Accounting Cycle

Students rated their knowledge of accounting cycle (from analysis of transactions to preparation of financial statements) *before* and *after* using the four online tutorials. We conducted a paired-samples t-test to compare the perceived knowledge of accounting cycle before and after viewing the online tutorials. The results (see Table 1) indicate that students' mean perceived knowledge of accounting cycle differs between the two periods, specifically, before using the AC online tutorials (M = 3.19, SD = 1.84) and after using the AC online tutorials (M = 5.10, SD = 1.03). The mean increase (after – before) is 1.916 and highly significant ($t = 15.63$, $df = 166$, $p < 0.0001$). The results support our hypothesis.

We also analyze the perceived knowledge of accounting cycle by separating students into two sub groups based on whether they have prior accounting knowledge. As expected, students with prior accounting background reported higher perceived knowledge (M =4.44, SD=1.14) before using online tutorials, compared to students without prior accounting background (M = 2.16, SD=2.16). The same pattern is also found after using online tutorials - students with prior accounting background reported higher perceived knowledge (M =5.51, SD=0.92) compared to students without prior accounting background (M = 4.77, SD=1.01). This result indicates the two groups continue to exhibit different level of understanding even after using online tutorials. An increase in accounting cycle knowledge due to the usage of online tutorials is found for both groups. The mean increase of perceived knowledge is 2.61 and highly significant ($t = 15.35$, $df = 91$, $p < 0.0001$) for students without accounting background; and the mean increase is 1.07 and highly significant

(t = 9.08, df = 74, p < 0.0001) for students with accounting background. The positive impacts on students who have prior accounting background is a benefit not anticipated.

We conducted formal statistical tests to examine the effects on students with and without prior accounting background. Consistent with our expectation, the impact of accounting cycle online tutorials is more salient on students without prior accounting background, compared to students with prior background. Students without prior accounting background reported greater increase in the level of knowledge of accounting cycle *before* and *after* using the four online tutorials ($M_{increase}$ = 2.61, $SD_{increase}$ = 1.63), than students with prior accounting knowledge ($M_{increase}$ = 1.07, $SD_{increase}$ = 1.02). The difference is statistically significant (t=7.13, p<.0001).

Table 1. Results of t-test and descriptive statistics for increase in perceived knowledge of accounting cycle due to the online tutorials

		Before online tutorials		After online tutorials				
Perceived knowledge of accounting cycle [a]	n	Mean	SD	Mean	SD	t	df	p-value
All Students	167	3.19	1.84	5.1	1.03	15.63	166	<0.0001
Students with Prior Accounting Background	75	4.44	1.14	5.51	0.92	9.08	74	< .0001
Students **without** Prior Accounting Background	92	2.16	1.65	4.77	1.01	15.35	91	< .0001

[a.] Survey scale 1=Very Low; 2=Fairly Low; 3=Somewhat Low; 4=Average; 5=Somewhat High; 6=Fairly High; 7=Very High

Chart 1: Increase in level of knowledge before and after using the online tutorials

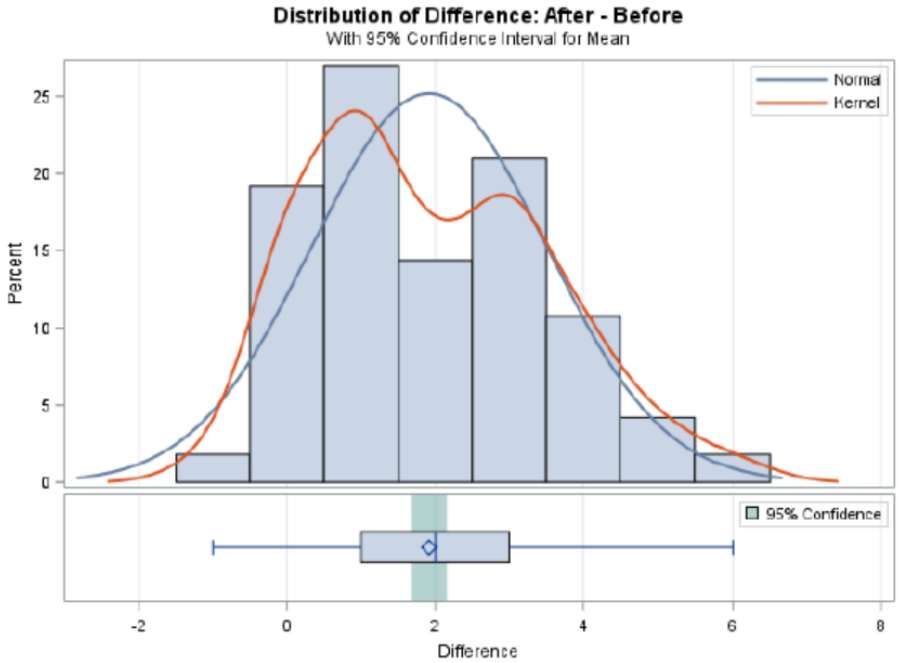
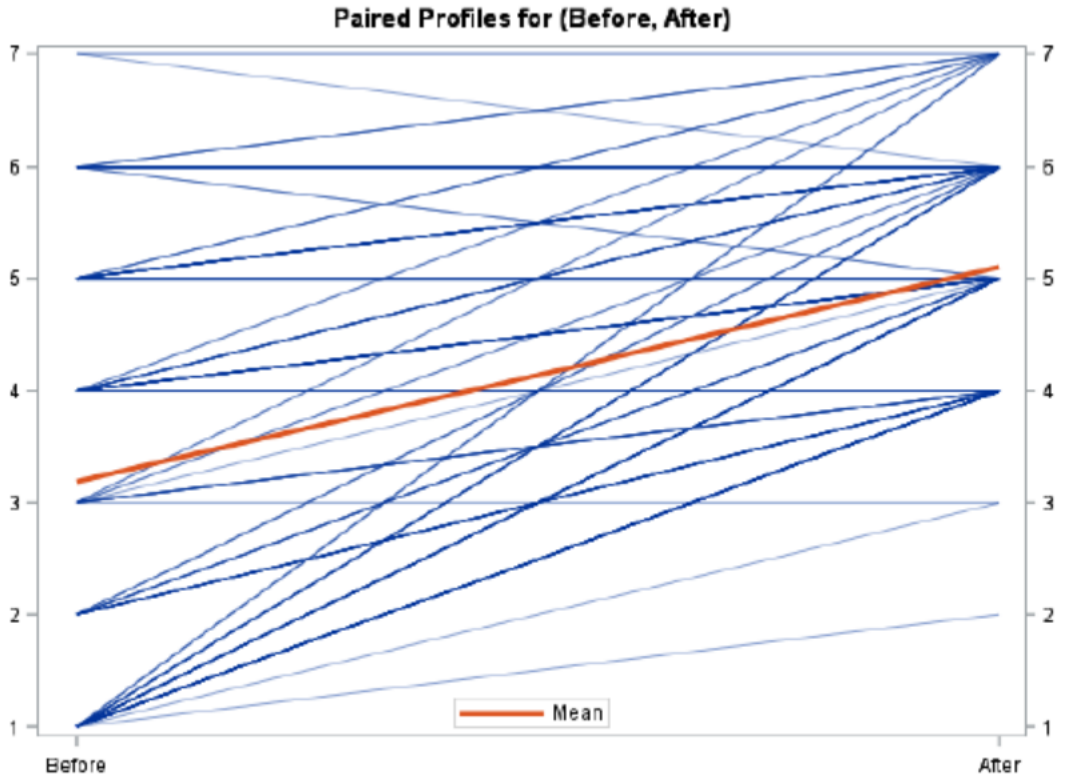


Chart 1b: Paired profiles of increase in level of knowledge before and after using the online tutorials



Student Feedback on Learning Experience

We asked students to rate the quality of content of the online tutorials from five key aspects: (i) quality of content, (ii) support for learning, (iii) task engagement, (iv) overall effectiveness, and (v) endorsement for future use on a 7-point scale ranging from strongly disagree (=1) to strongly agree (=7).

Table 2 reports the student survey results. The results indicated that students were highly satisfied with the quality of content (consistency with learning objectives: M=6.11, SD=0.81; understanding before lesson: M=6.25, SD=0.74); the self-paced learning offered by the tutorials (M=6.11, SD=0.98). Most students agreed that the online tutorials increase their interest in the subject (M=5.68, SD=1.14) and interactive activities help their learning (M=5.80, SD=1.07).

Overall, students were positive about the effectiveness of the accounting cycle online tutorials. A large majority of respondents indicated that the online tutorials enhance their overall learning of the topics (M=6.08, SD=0.90). Of the 167 respondents, 57 students (34.13%) strongly agreed, 78 students (46.71%) agreed and 24 students (14.37%) slightly agreed that the online tutorials enhance their overall learning. 5 students (2.99%) were neutral and remaining 3 students slightly disagreed or disagreed with the assessment.

Furthermore, students expressed strong endorsement of the accounting cycle online tutorials for future Financial Accounting classes (M=6.23, SD=0.88). Of the 167 respondents, 76 students (45.51%) strongly agreed, 64 students (38.32%) agreed and 19 students (11.38%) slightly agreed that they recommend the accounting cycle online tutorials for future Financial Accounting classes. 7 students (4.19%) were neutral and only 1 student did not recommend the tutorials. Students also recommended other courses to adopt digital learning materials (M=5.92, SD=1.09). But the endorsement for general course usage is not as strong as the

endorsement for financial accounting course. It suggests instructors should select the right course topics as digital learning and online tutorial does not provide one-size-fits-all solution.

Respondents also provided qualitative feedback. Students valued the four online tutorials as a useful digital tool for self-paced learning. They claimed that the online tutorials increase their interest in the subject and provided the business context for them to understand the accounting cycle. Selected students' comments are provided in Table 3. Findings of this study corroborate the findings of prior studies that online tutorials facilitate and enhance student learning.

Table 2. Student survey feedback regarding the accounting cycle online tutorials

	Questions [a]	Mean (n=167)	Standard Deviation
Quality of Content			
1	The content in the online tutorials is in line with the course's learning objectives.	6.11	0.81
2	The content allows me to have a basic understanding of the subject matters before lectures	6.25	0.74
Support for Learning			
3	The online tutorials allow me to learn at my own pace, enabling me to refer back to the contents if needed.	6.11	0.98
4	The interactive activities provide me timely feedback to help me learn.	5.80	1.07
Task Engagement			
5	The online tutorials increase my interest in the subject.	5.68	1.14
Overall Effectiveness			
6	Overall, the online tutorials enhance my learning of the topics.	6.08	0.90
Endorsement for Future Use			
7	I would recommend the online tutorials for future Financial Accounting classes.	6.23	0.88
8	I would recommend other courses to adopt the use of digital learning materials as a learning pedagogy.	5.92	1.09

[a.] survey scale 1=Strongly Disagree; 2=Disagree; 3=Slightly Disagree; 4=Neutral; 5=Slight Agree 6=Agree; 7=Strongly Agree

Table 3. Selected student comments regarding the AC online tutorials*

*Students also refer to the online tutorials as FALO (Financial Accounting Learning objects)

"The illustration and the graphics of the FALOs were very engaging and interactive. The concepts illustrated were clear as well, with a story line given, it makes accounting even more interesting to learn."

"I liked that there were interactive examples that could be studied at my own pace, the animations of examples and backstory helped with the understanding of the flow of the accounting cycle."

"It helps me to keep up with the content being taught in class. There is more clarity in the content in the FALO than the textbook."

"I liked that I had time to process the concepts at my own pace. I could also drag and drop the options and could try until I get the correct one. I also liked the explanations to the questions as they helped me understand my mistakes."

"It is very interactive and i like how it is very interesting to keep me focus on the subject. Especially the video because for someone which no background on accounting, it make me understand better and help me learn at my own pace."

"The online tutorials helped to reinforce my learning, and prepared me for lectures so I avoid feeling lost during class."

"They offer visual representation to certain concepts explained instead of just words and contextualise the content such that it is easier to understand how accounting cycle relates to the operation of a business entity. Also there are timely small practices."

"The FALOs allowed me to refer back to areas that I was unsure of. In addition, allowing me to repeat watching the videos make it easier for understanding the information."

"The tutorials were very easy to follow and fun, making it very interactive and not just a one sided learning. It actually helps me to remember the concepts better by remembering the story that was being told by the tutorials."

CONCLUSION

The accounting cycle is an important yet difficult topic for introductory financial accounting students to learn. This problem motivates the authors to examine whether a blended learning approach via online tutorials can improve students' knowledge of the topic. The authors developed four online tutorials to support learning of the accounting cycle in an undergraduate financial accounting course. We introduced the online tutorials to (1) introduce fundamental accounting concepts and business context to students without prior accounting background for pre-lesson preparations (2) refresh understanding of accounting entries and financial statements for students with prior accounting background. Within the online tutorials, students can apply their concepts while following the storyline of a start-up business. The results of an independent survey conducted by the University's CTE support our hypothesis. When comparing students' knowledge before and after they viewed the online tutorials, the results demonstrate that students significant increased their perceived knowledge of accounting cycle. The results also indicate students value the online tutorials for the learning experience and they strongly endorsed the future use of the accounting cycle online tutorials in an introductory course.

A limitation of this study relates to the outcome measurement. This study examines students' perceived knowledge of the accounting cycle, which may not reflect the actual knowledge of the accounting cycle. For fairness, the authors decide to give the online tutorials to all students enrolled in the course. Thus, there is no control sample where students do not receive the online tutorials for a difference-in-difference test. Lastly, the benefits of accounting cycle online tutorials may not be generalised to other courses. We do not expect the results to generalize to upper-level accounting courses because students already possess a more

sophisticated understanding of the accounting cycle.

Although the results of this paper suggest it is beneficial for instructors of introductory financial accounting course to implement these tutorials, interested instructors need to be aware of certain disadvantages associated with online tutorials such as some potential loss of flexibility as it's not easy to adjust online tutorials in reaction to students learning behavior.

Future research can examine the relativities effectiveness of online tutorials versus other learning interventions for accounting courses. Future research can also study how to effectively integrate online tutorials with other learning interventions in a holistic manner.

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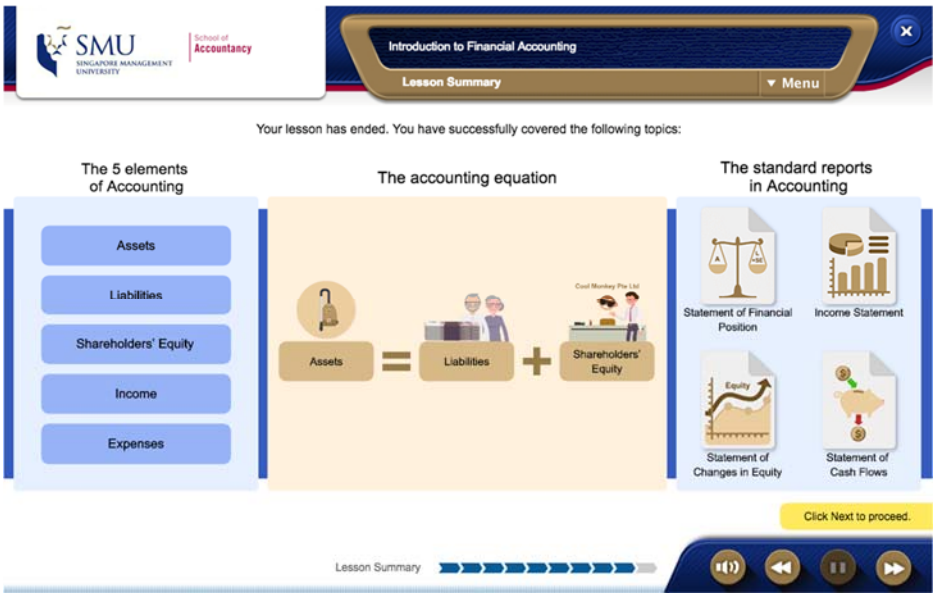
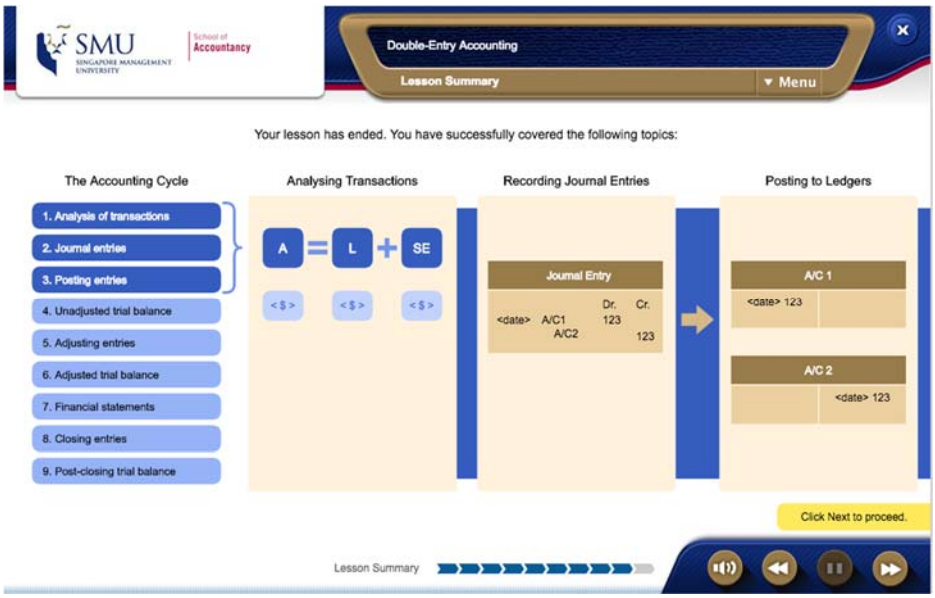
Appendix: Selected Screenshots of the four Online Tutorials

Figure 1: Online Tutorial 1 – Introduction to Financial Accounting



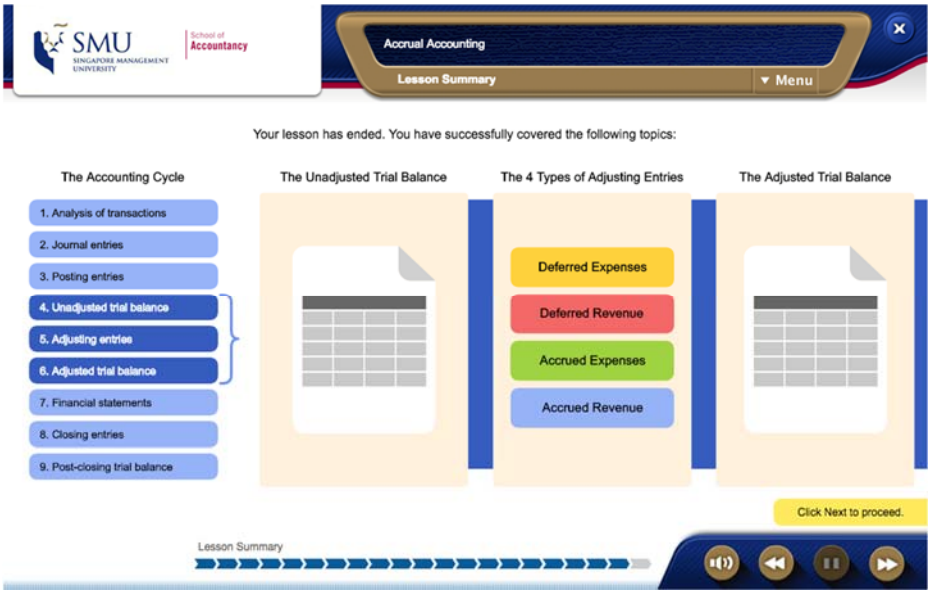
This is the summary screen showing what students would have learnt after going through the first tutorial.

Figure 2: Online Tutorial 2 – Double-Entry Accounting



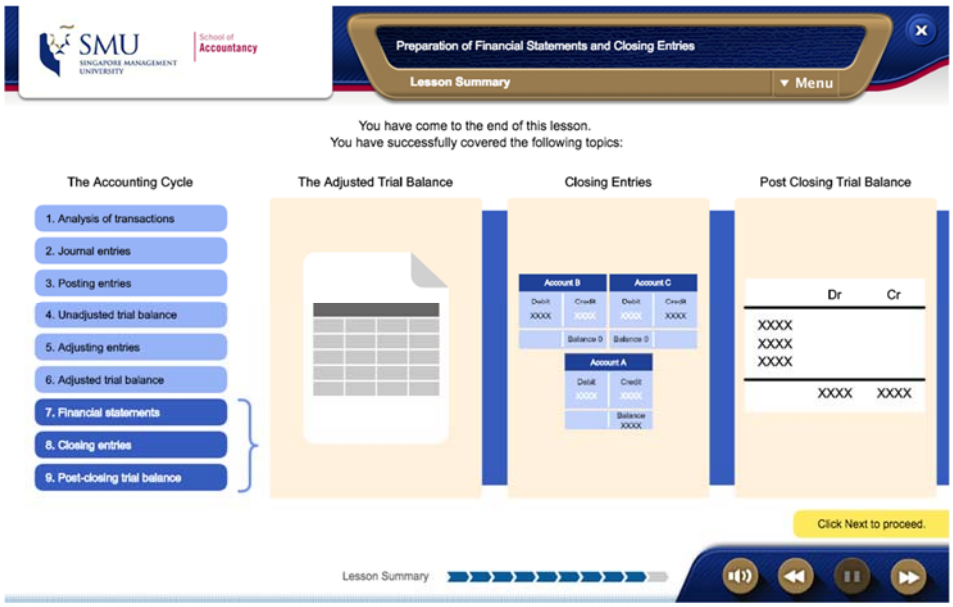
The summary page of the third tutorial detailing what is covered under steps 1 to 3 of the accounting cycle: Analysis of transactions, Journal Entries and Posting Entries.

Figure 3: Online Tutorial 3 – Accrual Accounting



The summary page of the third tutorial detailing what is covered under steps 4 to 6 of the accounting cycle: Unadjusted Trial Balance, Adjusting Entries and Adjusted Trial Balance.

Figure 4: Online Tutorial 4 – Preparation of Financial Statements & Closing Entries

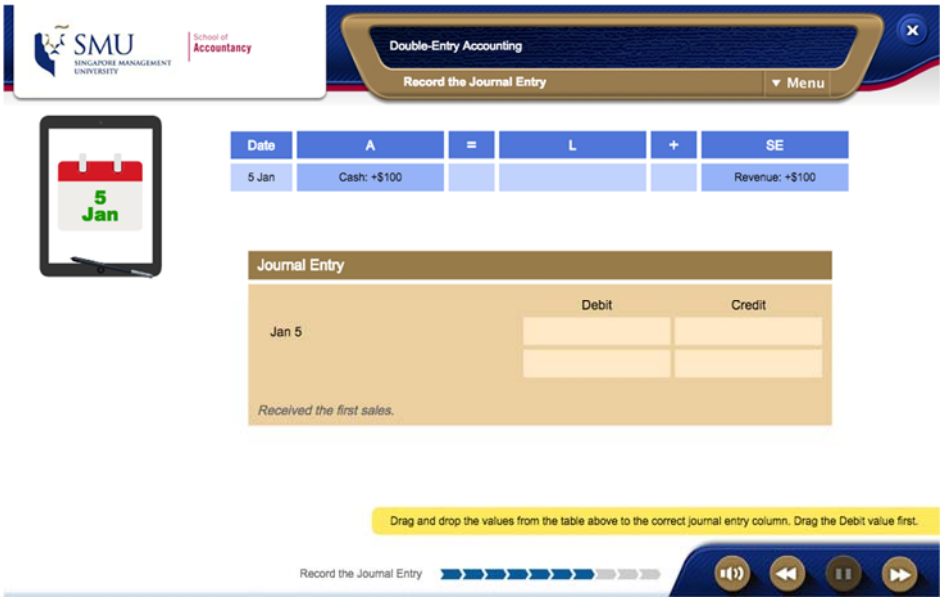


The summary page of the third tutorial detailing what is covered under steps 7 to 9 of the accounting cycle: Preparation of Financial Statements, Closing Entries and Post-Closing Trial Balance.

Figure 5: Use of Vlog (video blog) and Tablet to Help Visualize Accounting Transactions

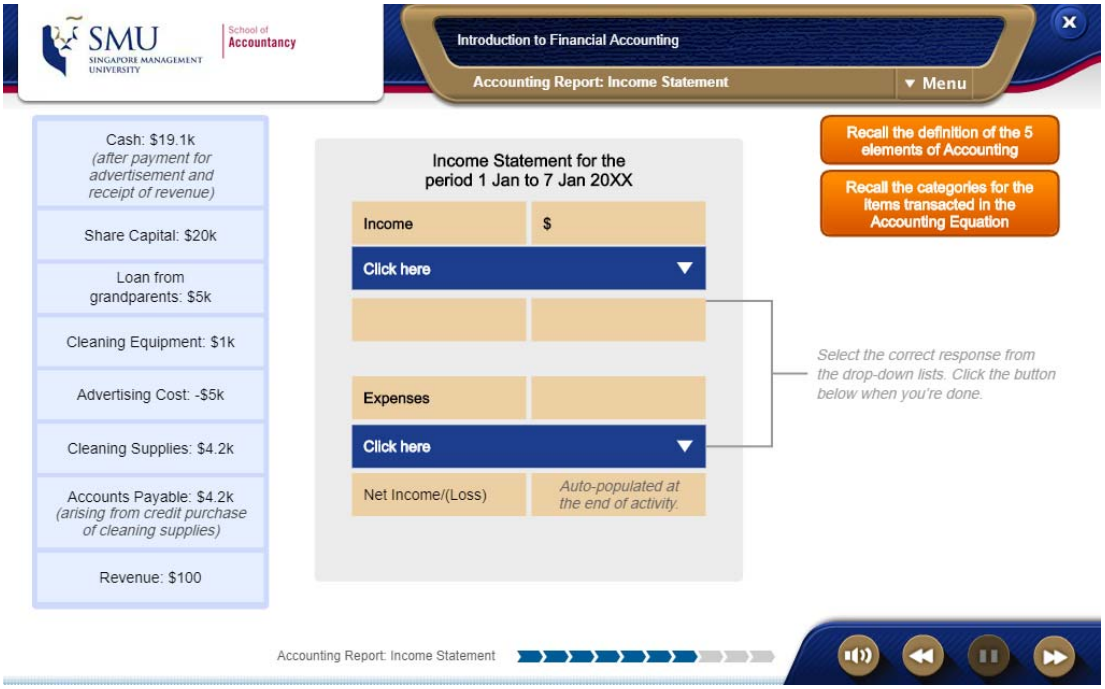
A video with an accompanying tablet to help students follow how the young entrepreneur go about getting his capital, buying equipment, advertising and getting his first job contract.

Figure 6: Recording Journal Entries



This is a screenshot from the second tutorial. Students are required to can drag the account title to the correct debit or credit columns. Immediate feedback will be given if there is an incorrect answer.

Figure 7: Preparation of Financial Statements with Recall Buttons



This is a screenshot of the first tutorial whereby the students are required to do a simple preparation of financial statements. There is a drop-down list for them to choose the correct items under each major category in the Income Statement. Recall buttons in orange are there to help them recall definition of accounting elements and their earlier exercise on classifying each transaction under the accounting equation.