

# *Development of Android-Based Accounting Cycle Learning Applications to Improve Technology Skills in Accounting Students*

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## **ABSTRACT**

Android based learning media is one way to enhance technology literacy amongst students. Learning implementation by utilizing smartphones and tablets may provide positive impact, not only cognitive ability but also metacognitive, affection and social culture realm. This research developed learning media with android operating system for Accounting Introduction Practice 1. Research method applied was Research and Development/R&D. Development model utilized was a modification from 4-D model by applying several stages, which were: define, design, and develop product. This research resulted in the accounting cycle learning product with several features, which were: (1) user manual, (2) account creation, (3) journal entry, (4) report statement that consisted of balance report, financial position, and cash flow. Media appropriateness level gained an average score of 79% with an appropriate category by material experts. The next appraisal by media experts gained a score of 93% with a highly appropriate category, and lastly according to students' response, it gained a score of 83% within a highly appropriate category. Based on that data it could be concluded that this android based accounting cycle learning media was appropriate for usage in Accounting Introduction Practice learning. However, this media still needs to be refined especially in terms of user manual so that it can be more specific and easily comprehended by its users.

**Keywords:** *Accounting cycle, Android-based learning media, Research and development study*

## **1. INTRODUCTION**

4.0 Industrial revolution development brings a transformation impact into life aspects, including changes in learning system. One of renewal in learning is the development of varied new literacies that need to be mastered by students. The new literacies are amongst others: literacy in terms of data, technology, and human resources [1]. Technology literacy can be defined as the ability to use, comprehend, arrange, and appraise a certain innovation that involves process and science to solve problems and expand one's capability. [2]. Therefore, technology usage to support learning is highly needed so that students have the skill in utilizing technology which in the end will be capable of inventing technology itself. One of technology in learning field is the usage of media that is operated on smartphone devices with android system. Nowadays smartphone usage in learning especially those android based ones are highly popular within society, in this case

students and college students[3]. This is proven from the massive growth of online learning applications such as *ruangguru.com*, *quipper.com*, and other learning applications that can be downloaded freely on Play Store platform or App Store. This shows that there has been a shift of interest amongst college students or students in comprehending a material. Survey result showed numerous students in Indonesia apply technology in classrooms compare to students in other developed countries. The research that was conducted by an educational organization in Cambridge found Indonesian students applied technology in classrooms more than students from other countries, which was in the amount of 40%. This figure was the second highest after USA in the amount of 54%. Other than that, over two third students in Indonesia or as much as 67% use smartphone in class and even more or as much as 81% use it to do their homework.[4].

## 2. LITERATURE REVIEW

Android based learning media usage is one of the means to enhance technology literacy amongst students. Basically online learning media usage is proven to upgrade academic achievement as well as learning motivation on students. [5]; [3]; [6]. Implementation of learning using smartphone and tablet can make a positive impact not only on cognitive skill, but also metacognitive, affection and social culture realm. Smartphone and tablet media have the advantage of transforming learning experience into real practice on site. In addition, smartphone and tablet based learning media are capable of preparing and receiving material anywhere at convenient time adjusted by users, thus they can enhance motivation in learning. This research developed device based learning media with android operating system for Accounting Introduction Practice 1 subject. Accounting Introduction Practice 1 is one of the compulsory subjects for students in 2019 curriculum. This subject is a new subject that is delivered to deepen the comprehension of Accounting Introduction 1 material, especially regarding accounting cycle in business practice. Accounting cycle is a repeated process from transaction recording stage to financial statements preparation. Materials in Accounting Introduction have already been presented for those who graduated from vocational school students majoring in accounting and high school students majoring in social studies, however not for students who graduated from high school majoring in science and other majors which are not economics. Therefore, varied early knowledge in this subject is quite a challenge for lecturers in teaching material in this subject. Material in the accounting cycle is quite an intricate matter, especially for non-accounting graduates. Research showed quite a large number of students have difficulties in understanding the accounting cycle due to long processes and quite a complicated account comprehension[7]. This leads to the need to have a change in accounting learning design, method, and curriculum [8]. All this time accounting introduction learning puts more highlight on theory and case comprehension [9]. Nevertheless, technology application in learning is scarcely conducted. These days applications that support material in accounting introduction can easily be found, such as *lamikro* application and accounting application for small business. Both applications are examples of applications that apply accounting cycle into practice of simple financial statements preparation in small business. On the other hand, these applications have a deficiency in introducing

terms in accounting, so when they are used for learning students experience confusion specifically in journal entry. Other than that, account usage that cannot be designed by them makes students incapable of understanding accounting process adequately. Based on the above matters, this research is developing android based accounting introduction learning media. Moreover, this application will later be applied directly into simple financial statements preparation in small business accounting.

## 3. METHOD

Research and development is essentially a kind of research to produce a certain product through needs analysis and product effectiveness testing stages [10]. For that purpose this type of research is multi years or longitudinal because it starts with product development until it reaches product testing stage [11]. However, this research was only designed for one year; in which the product development and product validity testing in analyzing the effectiveness of the media through experiments will be carried out in subsequent studies that are not discussed in this article. Development model utilized is a modification from 4-D Models by Thiagarajan, Semmel, & Semmel in 1942 [12] by applying several stages, which were: define, design, and develop product. At the define stage, activities are focused on determining and defining learning conditions that begin with objective analysis with the constraints of the material the device is developing on. In this case, it establishes the basic procedure for completing an accounting cycle.

The second stage is design, the purpose of this stage is to prepare a prototype of the accounting cycle learning application using android media which can be accessed via an android-based cellphone or PC. Through this activity, an accounting cycle learning application can be produced which in this study is called Draft I. In the develop stage, an assessment of product quality is carried out based on input from experts. This development stage begins with validation by experts, both material experts and media experts to test the previously designed learning tools (Draft 1) to produce Draft 2. This test is carried out to assess the quality of the product from the aspects of validity and practicality. Furthermore, the Draft 2 test was carried out by students. The product trial process is carried out to assess the quality of the product from its practicality and effectiveness aspects.

Evaluating product in this research only applies limited testing upon one class of students in Bachelor degree Accounting Program. The real field test will be conducted in the following year in order to perfect applied learning media.

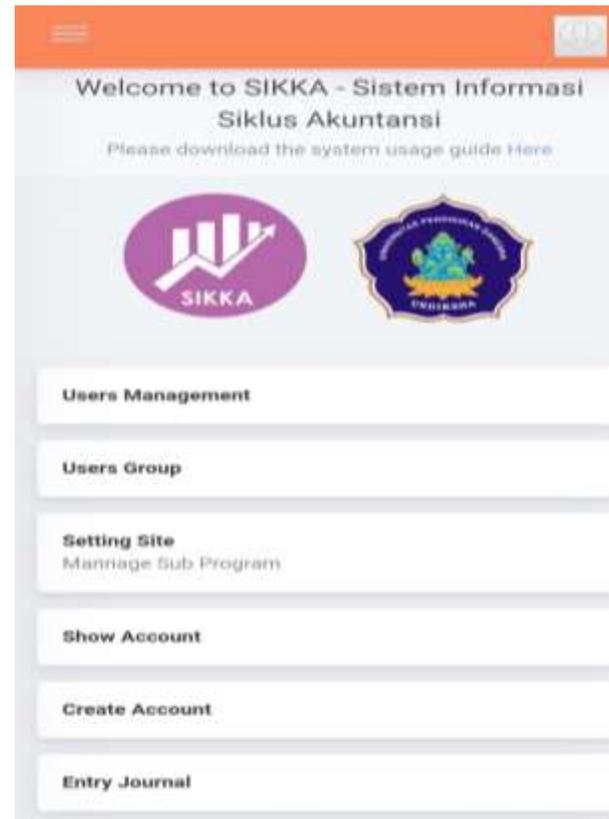
#### 4. RESULTS AND DISCUSSION

Android based learning media designed in the research named “*SIKKA*” short for *Sistem Informasi Siklus Akuntansi*. *SIKKA* is website based software that is able to manage simple accounting cycle from creating account number, journal entry, to income statement and balance. *SIKKA* can be accessed through various platforms from computer, laptop, tablet, and smartphone that are connected to the internet. Available features are as follows.

- 1) Users are able to register to system
- 2) System provides features for registered users to login and logout
- 3) System can manage self-account number
- 4) Systemic capable of performing journal entry
- 5) System can see journal list
- 6) System can see income statement
- 7) System can see statement of financial position
- 8) System can see cash flow report

Images of several features available in the system can be seen in the following pictures. In Picture 1 home menu display of the application is available for presentation. There are several features available for use. It can be broadly explained as follows. User management, users group, and setting site menu are menus used by account manager, in this case subject lecturer, to administer application users, in this case students. Since this application requires email address as well as user id and password to login to account, lecturer can appoint a class coordinator to create user id and password of each student in this feature. Once students get an account and manage to login, then accounting process may proceed. This feature is an initial step in starting *SIKKA* application. Students are directed to create account chart and account naming in accordance with account method, and then adjust it with the type of to be analyzed transaction. After that they can show the account by clicking the show account button. Here is the advantage of this account; it teaches students to comprehend further on the concept of account. Later on is journaling feature;

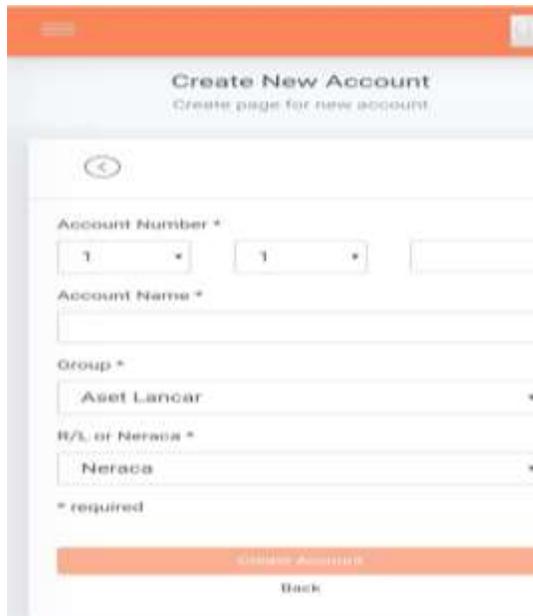
which is journal entry and show journal. Students are expected to be able to create a journal according to the transaction and check the accuracy of the journal by clicking show account. Lastly, application will precede transaction automatically and it will instantly show entity financial statements showed through profit loss feature, financial statements position, and cash flow report.



**Figure 1** Home Menu Display

Create account and journal entry features are available for display in Picture 3 and 4 as followed. In Picture 2, it shows several steps that have to be taken, which are: creating account number. In creating account number, students have to be capable of deciding whether account made goes to asset group, liability, equity, income, or load. If it belongs to asset, then click number 1 on account number. After that if it is included in current asset, click the next number 1. The last step is numbering with a 3-digit number. For example, if we are to make cash account, then the account number will be 1 1 100. If it belongs to a fixed asset, it will be 1 2 100, and so on to number accounts. Further on, in group it will instantly show the account grouping. At this stage students can reconcile whether they have inserted the correct account code. Afterwards, users also have to

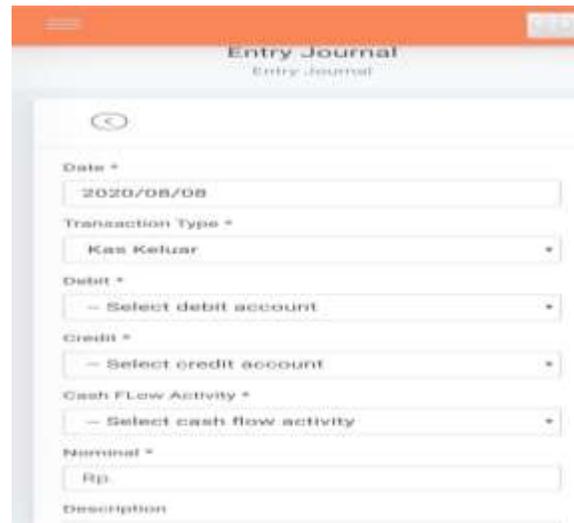
click whether that account goes into a balance account (real) or nominal account.



**Figure 2** Create Account Menu Display

On the journal entry menu as seen in Picture 3, we can notice steps in performing journal entry. It begins with entering transaction date, followed by transaction type; whether it is cash out, cash in, sale, purchase, or other transactions. Comprehension on a special journal is essential at this point. Subsequently, users insert debited and credited accounts. Students' understanding in performing transaction analysis with accounting method or debit credit rules and normal balance is highly required. Next, this application also introduces cash flow in a very simple way; in this case analyzing transaction whether it belongs to operation, investment, or funding activities. Lastly is inserting nominal value and description or journal information. After that application will perform transaction management automatically and users only have to click the displayed financial statements.

The next step in this research was performing product validation. Product validation test was conducted through questionnaire distribution to financial accounting material experts, in this case financial accounting subject manager lecturers and media experts, in this case Informatics major lecturers. While media technical test would be performed upon Bachelor degree Accounting major students in semester 2 of academic year 2019/2020 who took accounting introduction practice subject.



**Figure 3** Journal Entry Menu Display

**Table 1.** Media expert appraisal result data

No	Appraisal Aspect	Percentage Agreement	Criteria
1	Ease in usage and navigation	92%	Highly Appropriate
2	Aesthetic or beauty	90%	Highly Appropriate
3	Media integration	95%	Highly Appropriate
4	Technical Quality	95%	Highly Appropriate

Media appraisal conducted by media experts could be viewed from ease of use and navigation aspects, aesthetic aspect, media integration aspect, and technical quality aspect. Questionnaire distributed contained 16 questions that measured media quality. Testing result is presented in Table 1 as follows.

Questionnaire was also open for suggestions and improvement that could be written in the comment column. Suggestion analysis result from both validators was there was some improvement needed to be undertaken, such as: side menu display should show the position of menu being displayed / active, icons in action column in each data table needed to be

made smaller and in line, language usage could be adjusted to users language, in this case students, menu distribution on dashboard could be grouped based on their functions, Sikkahome menu representation button needed perfecting, and guidance documentation in system usage was necessary. Suggestions and inputs from media experts were adopted in the next media perfecting. The following is content validity appraisal viewed from material aspect by material experts. There were 18 questions that tested several indicators, which were material and basic competence suitability and learning purposes, content and purpose quality, as well as instructional quality. Appraisal results from material experts can be viewed in Table 2 below.

Regarding suggestions provided by material experts, some items needed working on are: application name showed cycle, yet display menu only showed accounting processes. The next suggestion related to menu simplification that looked excessive. Both suggestions were able to be responded; the first one regarding accounting cycle. In the accounting cycle it reflects repeated transaction activities in each period. This application can be utilized to describe a number of accounting periods, such as financial statements for January, February, and so on.

**Table 2** Media Expert Appraisal Results Data

No	Appraisal Aspect	Percentage agreement	Criteria
1	Material appropriateness with basic competence and learning purpose	85%	Highly Appropriate
2	Content and purpose quality	79%	Appropriate
3	Instructional Quality	74%	Appropriate

This application can reflect an accounting cycle, though needs the aid of several journals to cover nominal account and update real account. In the future this application will be perfected in terms or menu or features so that it will be more convenient for use by students.

After performing several revisions related to suggestions from material and media experts, the next step would be evaluation. This evaluation was undertaken by piloting application appropriateness to several students taking the subject. Pilot test by students could be viewed from several indicators, such as ease in use, course clarity, aesthetic, and instructional quality. This testing was undertaken through a questionnaire with 20 questions. Testing result undertaken by students can be viewed in Table 3.

**Table 3** Students Response Data

No	Appraisal Aspect	Percentage agreement	Criteria
1	Ease in use	86%	Highly Appropriate
2	Course Clarity	80%	Appropriate
3	Aesthetic	92%	Highly Appropriate
4	Instructional Quality	90%	Highly Appropriate

Student responses to this application are also very good, this can be seen in the results of the discussion which states that this application is very interesting and provides new knowledge and skills in solving case questions in an introductory accounting practicum. In addition, they also revealed that this application can foster students' interest and motivation in learning accounting. The results of this test are in line with other research which shows that the use of accounting learning media can increase student motivation in learning accounting [13], [14]

#### 4. CONCLUSION

Based on the results of research through the learning device development procedure with 4-D Models by Thiagarajan, Semmel, & Semmel, it shows that the android-based accounting cycle learning application shows very feasible criteria on average. From the assessment of media experts, it obtained an average score of 93% with very feasible criteria. Meanwhile, from the material expert's

assessment obtained an average score of 79% with proper criteria. Furthermore, the feasibility test carried out by students obtained an average score of 87% with very feasible criteria. Based on these data, this application can be applied to students taking introductory accounting practicum courses or as a complementary material in introductory accounting courses.

Things that can be suggested related to the development of this application include: still needed explanatory features for the use of the application that can show the relationship between the features in the application and the learning objectives to be achieved. Furthermore, feature simplification is also needed to make it easier to use the application. In addition, it is also hoped that in the future, there will be additional features that can show the interaction between lecturers and students. This is very necessary, because this application is practical which allows a gap with the theory that has been given. The application of this application has limitations, including the network or access which is sometimes unstable. This is because this media uses an internet connection, so it really depends on the signal strength in each area. However, overall this application can be used well by students, and students feel more benefits than just using the work paper that has been done in introductory accounting practicum courses.

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