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Developing A Board Game-Based Supplementary Learning Material Prototype for Accounting

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Abstract. The most effective approach for educators is to provide students with the knowledge and enhance their motivation to study, employ diverse pedagogical approaches shifted away from one-way teaching approaches, and prioritized students' needs by encompassing innovation tools such as the utilization of board games. This research aims to develop a prototype of an interactive board game as a supplementary tool for learning accounting. The game focuses on preparing financial reports and is designed to provide a practical learning experience in the field of business. This research utilized the waterfall model in research and development (R&D). Prototyping consists of communication, planning, design, construction, and distribution stages. During the communication stage, user requirements are elucidated through interviews with prospective users, observations of business practices, and examinations of relevant literature. Preliminary interview findings from culinary entrepreneurs indicate the challenges in preparing financial statements, which hinder their ability to communicate business performance and secure finances. The user's needs have been determined, and specific activities, timelines, resources, and budgets are set. The research employed an iterative prototyping approach in the prototype design process, wherein a sequence of tests is conducted consecutively to refine the prototype. In the production phase, the prototype is tested and assessed based on comments obtained during playtest sessions, with results satisfying testimonials. The advice received from students about the time limitation of the games was because of the complexity of accounting transactions, and then the games were modified by providing the spreadsheet version of the journal form that can be accessed from the barcode. This instructional tool was developed to enhance the efficacy of learning techniques, particularly in comprehending and mastering the accounting process, whether pursued individually or in a collaborative setting; hence, for the next research, we can transform this game into digital games to make it more interesting.

Keywords: accounting education innovation; board game-based; learning experience, waterfall model, prototype.

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1 Introduction

1.1 Background

According to Lin et al. (2019), the most effective approach for educators is to provide them with the necessary knowledge and enhance their motivation to study. Within the process of acquiring knowledge, motivation plays a crucial role in shaping the progress and outcomes of learning. An accounting educator's responsibilities encompass equipping students with the necessary skills, knowledge, and self-assurance for future professional endeavors [2]. This is crucial as a comprehensive comprehension of accounting concepts is essential to grasp the intricacies of this field [3]. To attain this position, educators must employ diverse pedagogical approaches that align with their expertise.

Learning often entails exchanging ideas and experiences among students and their surroundings [1], wherein students actively investigate and accomplish tasks, discerning pertinent information and acquiring fresh knowledge and competencies to confront novel obstacles. Research findings indicate that many accounting students struggle to comprehend accounting principles [3] due to diminishing memory and inadequate conceptual understanding [4]. The different types of memory discussed here are connected to the approaches used by accounting students when completing their assignments, specifically concerning their perception of academic requirements. It has been observed that students who possess a strong grasp of accounting concepts tend to adopt a comprehensive approach and consistently achieve good results [5].

Accounting education has faced criticism for producing graduates with a narrow focus on the impact of their decisions solely on shareholders and businesses. This criticism emerged in response to the Enron bankruptcy case. Consequently, accounting educators are urged to foster students' imagination and critical thinking abilities to consider the interests of various stakeholders beyond just shareholders and businesses [6]–[8]. The objective of accounting education is to develop strategies that enable students to gain a deep understanding of how accounting impacts individuals and communities. This necessitates using pedagogical or unconventional methods to actively engage students in their learning experiences [9]. An education system that prioritizes management and shareholder profits disproportionately diverts attention from the essential task of addressing information requirements. Accounting education is limited when it focuses solely on teaching technical practices, such as documenting transactions in prescribed formats. To address this constraint, it is important to enhance active learning methodologies that help students interact with the real-world social aspects of accounting [9].

Recently, educators have shifted away from one-way teaching approaches and enhanced their ways by employing diverse creative tools and prioritizing students' needs. The methods employed in previous studies encompassed the utilization of board games for marine science education [1], collaborative simulations derived from the CAPSIM Foundation's Business Simulation Game [10], the incorporation of monopoly games [11], and the utilization of puzzles to fulfill audit tasks [12].

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1.2 Literature Review

Stimulus-Organism-Response (SOR)

The SOR (Stimulus-Organism-Response) Framework theory, developed by Mehrabian & Russell (1974), builds upon Woodworth's S-R formulation from 1954. The model demonstrates that the environment (S-Stimulus) can impact customer mood (O-Organism), hence eliciting a behavioral reaction (R-reaction). Stimulation, often known as stimulation, refers to a circumstance that impacts customers' emotions, perhaps leading to alterations in their intentions and behavior. Organisms process inputs to derive meaningful information, which influences emotional and cognitive changes at an individual level.

In this study, it is believed that the stimulus provided in the form of knowledge of basic accounting concepts and skills in preparing financial reports, can produce a positive response if the right learning environment is provided. Learning through board games is a learning tool that produces a feeling of fun and engagement between students and the accounting material presented. The SOR theory is explained in Fig. 1.

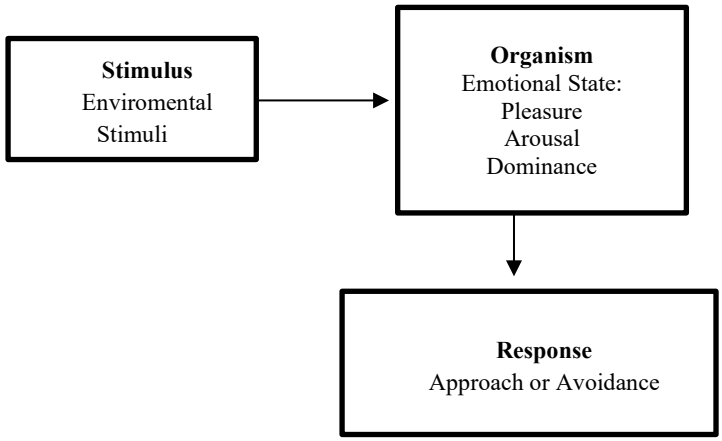

Fig. 1. SOR Framework

Simulation Game

Much educational literature reports on how simulation games are designed to meet learning outcomes and are developed based on learning theory, which functions as an effective means of promoting the learning process for students [14]–[16]. The games developed without considering the mode produce better learning outcomes than those who only learn from textbooks [17].

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In human immunology, students who learn with the Humunology game can surpass the performance of students who learn through content on the website on items tested regarding their understanding of procedural knowledge and high-level cognitive processes [18]. In Taiwan, a board game combined with marine science has been designed. By playing board games, students learn about scientific concepts and their relevance. This game fosters students' literacy in a "virtual" way by inviting them to play the role of sea creatures with as much interest in marine life as possible. This tool has been proven to increase students' scores [1].

Within the realm of accounting, the CAPSIM Foundation Business Strategy Simulation Game might be utilized to enhance students' self-assurance in crucial management accounting abilities through large-scale integrative business simulations (LSIBS) [10]. The simulation game, which utilized modifications of the Monopoly game, demonstrated a notable enhancement in both pre-and post-test scores compared to students who engaged in Computer-Assisted Instruction (CAI). However, the improvement was less pronounced than the Extended Accounting Problem (EAP), which involved a paper-based case study [11]. Regarding auditing subjects, students participate in simulated cases by being placed in modified rooms and assuming the role of junior employees in a public accounting firm. The individuals were responsible for solving a riddle as part of an audit assignment [12]. Research indicates no substantial disparity between active and traditional learning in the active learning process. However, the scores of students in the active learning group surpass those of other groups [19]

Most of these games were developed by using the case study and not employing visualization of transactions in the accounting process to enhance memorizing and understanding. Kuang et al. (2021) use visualization concepts of accounting by modifying Monopoly games for high school accounting students by extending previous uses of Monopoly to include additional accounting-relevant features (e.g., the inclusion of transactions that students must exhibit the practical application of fundamental principles learned in introductory accounting courses by engaging in scenarios that challenge them to solve a range of actual difficulties where information about which transactions need to be recorded and adjusted are not specified). Unlike previous games, this game used material from higher education with more complex transactions, which mixed in the introduction, intermediate, and cost accounting to combine various areas closer to the realistic business case. The games are designed to be usable both in distance learning education individually and in traditional classes. All games developed earlier are employed in traditional classes with face-to-face learning modus.

Simulation games are utilized to facilitate the achievement of learning objectives in many ways, enabling students to apply accounting principles that necessitate advanced cognitive abilities as per Bloom's taxonomy, which serve as the desired learning outcomes of the lesson. This simulation game demonstrates that unorthodox or unconventional teaching methods can evoke emotional and intellectual responses from students, hence fostering their active participation in the learning process [9]. While it is unnec-

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essary to abandon traditional methods completely, teaching approaches should prioritize efficiently transmitting vocabulary, knowledge, core concepts, and principles [20]. Hence, interactive corporate accounting teaching tools in the form of game simulations are anticipated to enhance comprehension of ideas and accounting proficiency that may be applied in traditional classroom settings. This tool can serve as supplemental content in accounting learning modules for distance learning (PJJ) programs, catering to study groups and individuals.

Various instructional tools are produced to simulate specific topics in learning. Researchers aim to create an interactive instructional tool that simulates the entire business process and accounting record-keeping, up to the preparation of financial reports, to provide users with a comprehensive understanding of the business. It is expected that the rigidity of learning that comes from textbooks will be reduced, and the learning process will become more interactive. The use of visual aids can be implemented in the classroom for conventional learning systems or at individual locations when using distance learning systems, as they are equipped with guides and video simulations. The conceptual framework of this research is illustrated in Fig. 2.

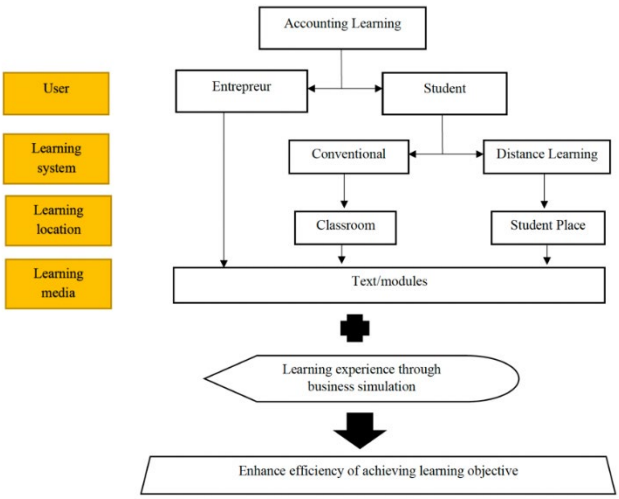

Fig. 2. Framework of Research

2 Method

This study employs a mixed-method approach, specifically research and development (R&D), to design interactive teaching tools for business accounting. The design process follows the waterfall paradigm described by Pressman (2012), which is commonly utilized in system development. The waterfall approach is employed in scenarios when implementing enhancements into a well-defined system, such as accounting, will provide only minimal modifications. This method is only utilized if the request is clear and

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stable in the workflow from communication to delivery to the user. Fig. 3 illustrates the workflow of the waterfall paradigm.

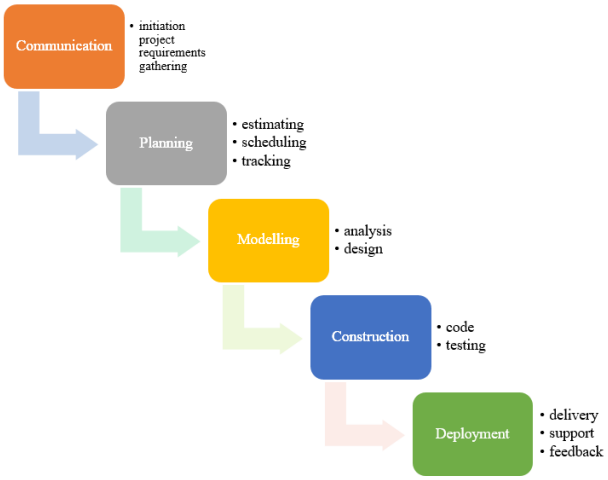

Fig. 3. Illustration of the waterfall model (Pressman, 2012)

In the waterfall model, the work phases are executed sequentially, meaning each stage must be finished before proceeding to the next one. The plan for the waterfall model is as follows:

Communication (the act of conveying information or ideas)
The initial communication and data-gathering phase focuses on user requirements. The utilization of this instructional tool encompasses students, entrepreneurs, and professionals in the business sector. Data collecting strategies are implemented using many methods, specifically:

a. Interview
   Data collection is accomplished through interviews or focus group discussions directly with individuals involved in the research. In addition to users, the interview process also involved professionals with extensive knowledge and expertise in the accounting field, particularly in preparing financial reports.
b. Observation
   This observation method involves directly examining the topic of study, which is a business example utilized as an illustration or simulation case in an accounting recording situation. At this point, there is an expectation for a comprehensive understanding of the business process, starting from creating purchase orders to accepting payment.
c. Literature review
   Conducting a literature review is essential as it involves examining accounting standards applicable in Indonesia, such as MSME Financial Accounting Standards (SAK UMKM), Financial Accounting Standards Without Public

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Accountability (SAK ETAP), or IFRS-based Financial Accounting Standards (SAK), along with other relevant references

Planning
Once requests and user data are acquired, they will be assessed by assessing key aspects during the planning phase, such as the nature of the activities, budgetary considerations, resource allocation, materials utilized, and activity timelines, as well as the expected outcomes of each activity.

Modelling
Iterative prototyping is employed in creating props models, involving multiple rounds of testing and refinement (Christie & Jensen, 2012). This iterative approach continues until the design is deemed optimal for manufacturing. A prototype is an early version representing a specific component of a final concept or design before it goes into production [22].

Construction (creation of a prototype)
Once the design is completed, the prototype will be manufactured according to the predetermined numbers and materials specified during the design phase.

Deployment (transferring to end-users)
The handover stage to the user represents the ultimate phase. At this point, the props will be simulated for the users. Users are provided with technical instructions on how to utilize the props. User feedback is crucial for enhancing the functionality of this product.

3 Result and Discussion

3.1 Result

The study focuses on creating additional resources in the form of instructional materials to enhance students' understanding of financial accounting and their ability to generate financial reports following relevant standards. The financial reports that are the focus of the study are the financial position report, profit and loss report, cash flow report, and change in equity report. While the primary demographic for this product consists of kids, it is also accessible to other individuals, including business professionals and high school students. Researchers received assistance from various stakeholders, such as entrepreneurs and students, in developing educational resources. Business professionals and students residing in the Jakarta and South Tangerang regions. There are five food business actors and one beverage business actor. The assisting individuals were students from Universitas Terbuka (UT).

The research involved the utilization of the waterfall methodology to build prototypes of accounting teaching aids. The model comprises several stages: communication, planning, modeling, construction (prototype production), and deployment (handover to users).

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Communication

During this stage, researchers engage in interviews with prospective users and sources of inspiration for the simulated commercial product. The process of needs analysis and design of research problems involved visiting multiple corporate entities, conducting observations, and interviewing students. The outcomes of the interview are:

1. SMEs in the food industry

   The South Tangerang Catering SME group, mainly involved in food catering, lacks structured business planning. They often engage in impulsive transactions and coming business and household funds. They struggle to provide regular business updates and generate accurate financial reports. Particularly concerning is the misconception of inflow as revenue and outflow as expenses. Female business owners, responsible for a significant portion of family expenses, are affected by this. Precise financial reporting, including profit and loss statements, is essential for evaluating business performance and formulating strategic goals.

   Findings from the observations of the food business cycle

   Catering operations involve several stages: planning, preparation, processing, serving, and cleaning, aiming to maintain food quality and meet client needs. However, the industry faces challenges such as fluctuating costs due to demand variations and seasonality. Procurement management is crucial, as inventory flaws can affect financial statements, especially the cost of goods sold. Revenue fluctuates based on event quantity and type, making accurate prediction challenging. High overhead and fixed expenses, including equipment and staff pay, require precise allocation to events. Distinguishing personal and business expenses is a common struggle for catering owners using personal resources.

2. SMEs in the drink product industry

   Tau Rasa Jus, founded by Mr. Rahmad in mid-2020, operates as a self-sufficient juice kiosk offering a variety of fresh and nutritious fruit juices at IDR 5,000 each. Despite facing initial obstacles, Mr. Rahmad remains determined in his entrepreneurial pursuit alongside his wife. The business, situated at the Pasar Minggu train station in East Jakarta, is gradually progressing. Mr. Rahmad stays updated with technology by enrolling the business with GoFood for sales transactions. The kiosk is equipped with a juice machine, blender, and kitchen utensils, and it is leased for Rp. 500,000 monthly.

   Findings from the observations on the business cycle of beverage industry participants:

   Entrepreneurs choose fresh and premium-grade fruit. Certain juice producers may employ either a singular fruit or a blend of different fruits to concoct a distinctive taste. Subsequently, every newly harvested fruit undergoes a thorough examination to verify its absence of any harm or decay. The fruit is sanitized, peeled (if required), and diced into small fragments to facilitate the blending procedure. The fruit is put in a blender along with water or another

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beverage. Operate the blender until the fruit achieves a state of perfect smoothness and thorough mixing. The blender fruit juice is stored in sealed containers and distributed to consumers.

3. Students
   Accounting students face numerous challenges due to the intricate nature of the field, requiring a deep understanding of technical concepts and financial principles. They struggle with fundamental concepts like balance sheets and profit and loss, which are crucial for comprehending more complex subjects. The diverse standards and regulations in accounting often lead to confusion, compounded by intricate terminologies. Applying accounting knowledge to practical situations poses difficulties, as does comprehending and analyzing financial reports. Proficiency with accounting software is hindered by a lack of familiarity. Understanding the sequential stages of the accounting cycle is essential, yet students struggle with grasping their interconnectedness. Regular practice, ideally through practical exercises or case studies, is necessary, but students find it challenging to allocate sufficient time, especially in distance learning settings.

Planning
Through the analysis of interviews and observations, we have found specific learning difficulties pertaining to the content of financial report preparation. These include:

1. Learning materials necessitate explicit learning objectives. When preparing financial reports, it is necessary to go through several distinct stages. These include analyzing financial transactions, identifying them, creating the appropriate journals, recording them in the ledger, summarizing the trial balance, making any necessary adjustments, finalizing the trial balance, and preparing the financial reports.
2. Most participants who will utilize diverse learning styles are primarily independent learners, as they are students who use the PJJ learning system. However, this game can also be implemented for participants from traditional classroom settings. The participants' knowledge levels range from basic, encompassing high school students, new students, and businesspeople to advanced students, including currently working (practitioners). The primary target participants, specifically PJJ class pupils, have minimal engagement with lecturers, necessitating the need for instructions that may be comprehended and studied autonomously.
3. In traditional classrooms, teachers can direct participants to finish the game; however, in PJJ classes, teachers restrict engagement with participants.
4. In traditional classrooms, participants can take turns using tools, resulting in a restricted number of tools being produced. However, in PJJ classes, students are dispersed as they study from their individual homes.

Once the factors to be considered in the planning of a prototype have been identified, the prototype will be designed with careful consideration of learning outcomes, objectives, target groups, game mechanism design, board game components, instructional

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design, prototype testing, graphics, and visuals, technology (if applicable), supporting educational materials, and evaluation design.

a. Learning outcomes: Assist students in comprehending fundamental accounting principles and intermediate and cost accounting processes, enabling them to generate financial statements from complex activities. Simulations are utilized to learn about the fruit juice industry.
b. Purpose
   Students possess the capability to comprehend accounting tasks and implement accounting methods and approaches, encompassing:
   1. Gain comprehension of the transaction cycle by simulating the fruit juice industry transactions.
   2. Proficient in scrutinizing financial transactions
   3. Capable of documenting transactions in a journal.
   4. Capable of transferring journals to the ledger.
   5. Proficient in generating financial reports.
c. Target
   The primary target for board game development is students utilizing the PJJ educational platform. In addition, board games might be utilized by accounting students in traditional schools, company professionals, and the general populace.
d. Mechanics of the game
   The game is a board game in which players utilize transaction cards to execute financial transactions within a company simulation. Subsequently, players employ accounting methodologies and protocols to generate financial statements.
e. Components of a board game
   Card games employ the board game format.
f. Educational resources
   The material utilized is presented in a booklet format, encompassing a concise overview of the game, instructions on how to play, and supplementary instructional content.
g. Conducting prototype testing
   Conducting a trial of a board game prototype with a cohort of prospective consumers. During this stage, observations are conducted to analyze their interaction with the game, identify potential areas for enhancement, and gather feedback. Testing was conducted on Universitas Terbuka Accounting Program Study students.
h. Graphic and Visual Design.
   Design visuals and visual aspects of the game to be attractive and help learning. Board games are intentionally developed to align with educational objectives and avoid confusing players.
i. Supplementary educational resources
   The supporting resources players utilize consist of working papers in forms employed in preparing financial reports.
j. Evaluation
   Participants will compute the score according to the predetermined circumstances and criteria to ascertain the winner.

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Modelling

The flow diagram presented in Fig. 4 depicts the process of designing games as supplementary material in accounting education. Game activities commence during the preparation stage. The game is comprised of two distinct sections, specifically the basic level and the intermediate level. Players could obtain business graphics and perform financial operations that necessitate accounting records.

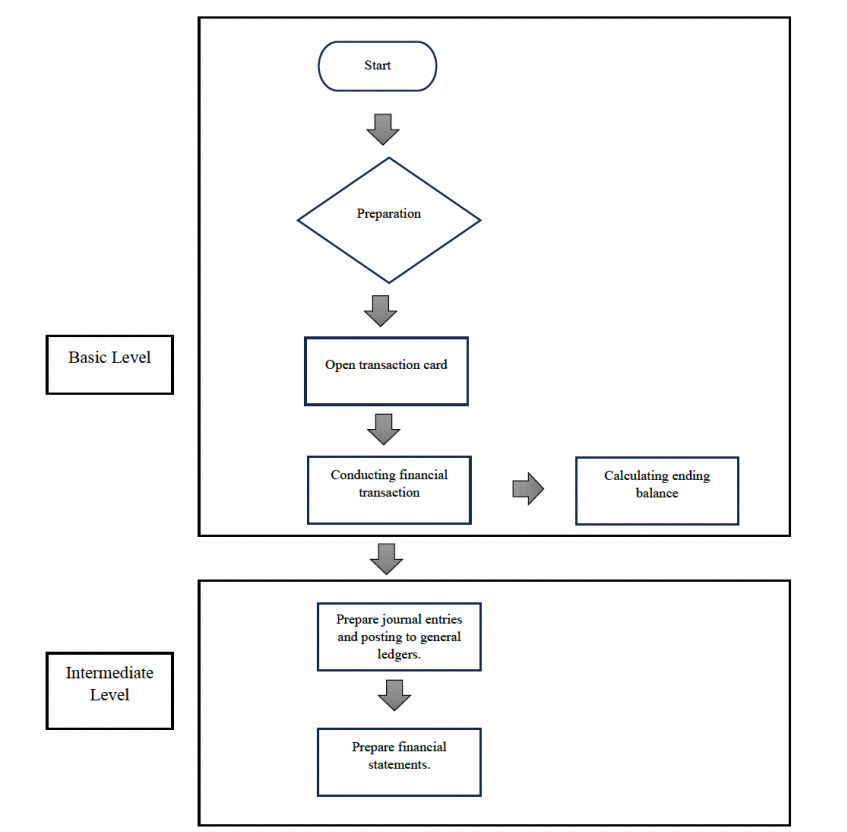

Fig. 4. Game Flow Diagram

The game stages can be categorized into four parts: preparation, opening a transaction card, conducting financial transactions, and calculating the final balance.

1. Preparatory phase.
   During the preparation stage, participants verify the completeness of the game equipment. This equipment includes transaction cards, which consist of various transactions such as initial deposits, purchases of fixed assets, purchases of raw materials, payments for operational expenses, sales, adjustments, and production orders. There are 22 mandatory transaction cards and two optional cards. Additionally, money exchange tools are used in different currencies. The equipment also includes cards for raw material props, finished goods, and

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production equipment. These cards include 5 kg melon display cards (1), 5 kg mango display cards (2), 3 kg sugar display cards (3), gallon display cards (3), packaging display cards (3), melon juice display cards (50), mango juice display cards (100), stationery display cards (1), blender display cards (1), and a player's guide booklet. Subsequently, the participants organized the transaction cards in a sequential stack, arranged the currency exchange cards according to their individual unit value, categorized the raw material cards based on their respective material categories, and sorted the finished goods cards depending on the product type.

2. Open the transaction card.
   Before conducting the transaction, participants receive a concise overview of the company and specific provisions, including a brief company description, provisions on the recording system, inventory valuation methodologies, and depreciation methods in the specified scenario. The transaction cards are organized sequentially according to their numerical order.
3. Conducting financial transactions.
   Upon accessing the transaction card, participants will sequentially unveil the transaction cards in ascending sequence. Participants can choose to execute or abstain from the transaction based on their strategy. The types of transactions encompass a wide spectrum, including capital transactions, purchases of raw materials, manufacturing transactions, sales of finished items, and adjustment transactions.
4. Calculating the ending balance.
   Upon completion of the basic level game, participants are required to compute the ultimate balances, including cash, raw material inventory, and finished goods inventory. The ultimate equilibrium will be juxtaposed with the answer key to ascertain the score of the participant.

During the preparation of financial reports, researchers organized a Focus Group Discussion with lecturers from the accounting study program to verify that the design aligned with the intended learning outcomes of the courses to be included, specifically those related to financial accounting.

Construction

To make the game flow easier to understand, the following game glossary contains a collection of components illustrated in Fig. 5. Game components at the basic level consist of various transaction display cards, raw material display cards, fixed asset display cards, and finished goods display cards.

During the intermediate stage, gaming components are incorporated into the existing components utilized for financial report preparation. Participants are equipped with documentation about the creation of financial statements to finish the intermediate-level game depicted in Fig. 5.

In the intermediate-level game form, financial statement terms in accounting are used, consisting of:

1. Balance Sheet Form

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The financial position report, known as the balance sheet, is a report that contains a statement of financial position, namely assets, debt and capital [23]. The company displays the asset position first, then debt and capital. The total assets must be equal to debts plus capital.

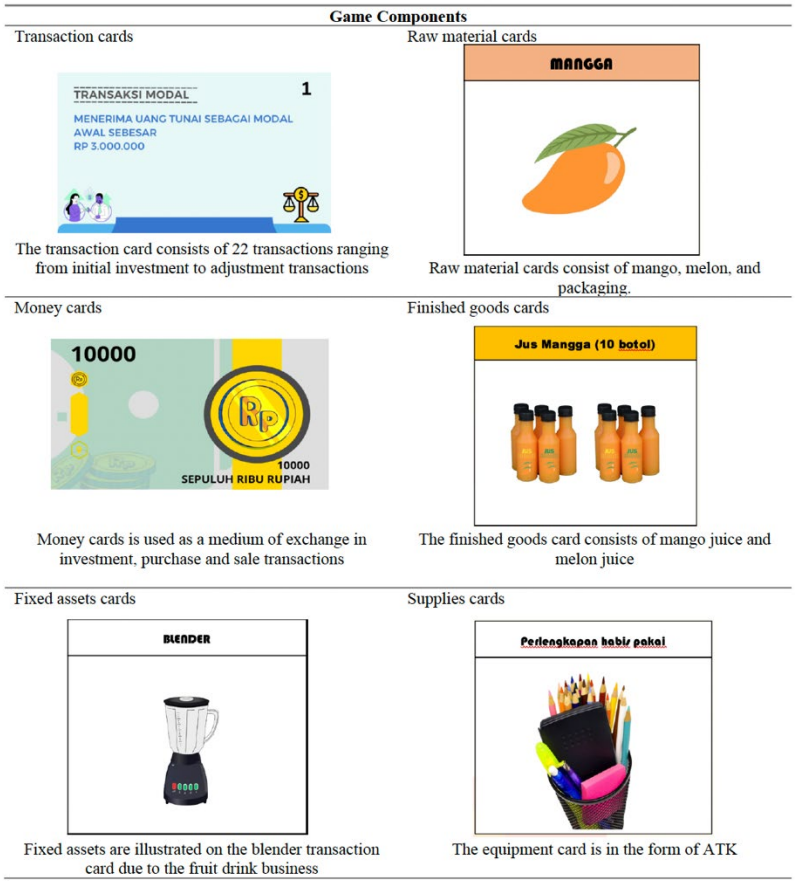

Fig. 5. Glossary of game components

2. Profit and Loss Statement Form

An income statement is a report to measure the success or profit of a company's operations in a certain period (Weygandt et al., 2019). First, the income statement displays sales, then followed by expenses. After that, the profit or loss from the business can be calculated. If sales exceed expenses, it is called profit. If expenses exceed sales, it is called a loss.

Income

Income is increased capital originating from business activities [23]. Income is generally obtained from selling merchandise and services, renting property, and borrowing money. Sales will later increase the number of business assets.

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Cost of goods sold.
The cost of goods sold is the cost of goods sold during a certain period [23]. These expenses are directly related to income from the sale of goods. The cost of goods sold consists of the raw materials used and direct and indirect labor costs.
Expenses
Expenses are the costs of consuming assets or services used to generate income [23]. Expenses reduce the capital generated from business operations. Like income, expenses have many forms, such as raw material costs (flour, sauce, tomatoes, etc.), salaries and wages expenses, utility expenses (electricity, gas, water), telephone expenses, shipping expenses, rental expenses, interest expenses, etc.

3. Cash Flow Statement Form
   The cash flow statement provides information regarding cash received and paid in a certain time period [23]. The cash flow statement consists of cash flows from operating activities, investing activities, and financing activities.
4. Equity Change Statement Form
   The cash flow statement provides information regarding changes in retained earnings in a certain period. A specific period refers to the income statement period

In the construction phase, so that the prototype design produces a quality product and is in line with learning outcomes, a Focus Group Discussion was held with board game manufacturing experts via a Zoom meeting from Waroong Wars.

Deployment
This procedure aims to assess both the technical performance and the ability of our teaching materials to deliver a comprehensive and engaging accounting learning experience. Before commencing observations regarding the tool's usage, we establish the particular objectives to be accomplished through testing, delineate test scenarios, and provide detailed evaluation criteria. The primary focus of this research is on UT Accounting students, who constitute the key target demographic.

The majority of participants provided input on processing time in this task. Completing the journal, uploading, and producing financial reports takes longer when the form is filled out manually. To expedite the journaling procedure, utilizing the Excel format with a feature allowing for the selection of a journal account is optimal. Students must only complete the nominal and transaction journal positions, as the account selections are carefully organized. The volume of transactions is deemed excessive when manual methods are still employed. Minimizing the frequency of manual transactions can be a viable strategy. Utilizing Excel to choose journal accounts and allocating a specific area for transaction cards helps streamline and expedite the process. The time needed for journaling can be greatly decreased by identifying transactions that can be automated or simplified. This strategy has the potential to reduce the time needed.

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Special links can be added to Excel file attachments to enhance accessibility and facilitate document management. This will facilitate the process of pupils acquiring the essential files. By implementing hyperlinks, the document distribution process can be streamlined and optimized. By integrating technology, optimizing design, and enhancing accessibility, the journaling process can be transformed into a more efficient and user-friendly experience for students. This approach considers the temporal dimension and guarantees the integrity and precision of the collected data. Consequently, a digital file was generated and disseminated as a booklet with a barcode.

Students also feel that transaction cards are not well organized and are often mixed up. So, the need to design a special place for each transaction card is an important step to avoid transaction errors. By assigning a designated space to each transaction, the risk of cards getting mixed up can be minimized. This will also create an order that makes the game easier. To support the PJJ learning system, where students basically learn independently, an instruction booklet was created that students can understand and apply even though they do not meet face-to-face with the teacher or facilitator. If the game is played in a conventional class, the facilitator will help students draw conclusions about things that can be learned in this game.

3.2 Discussion

This research produces teaching tools specifically created to enhance students' interest and motivation in studying accounting and deepen their comprehension of real-world business practices in the beverage industry, which is usually called "jus," and the interconnectedness of accounting with it. It is divided into two levels of games: basic level and intermediate level. The basic level game consists of four phases: preparation, opening a transaction card, conducting financial transactions, and calculating the ending balance. The user prepares cards on the table as the instructional leaflet and then opens cards based on the card number sequence. Every card contains a figure that illustrates the kind of transaction and purchased product or product sold. They do the transaction like a real business, using money cards to buy products and receive money cards when selling product cards. In the final part of the basic level, they calculate the balance according to the kind of transaction, like purchasing, selling, cash received, and cash disbursement. To determine how much score they have, they check with the answer key given and score by themselves. The intermediate level contains two phases: journaling and preparing financial statements. Every transaction card they get must be recorded using a special journal template provided. Then, based on a special journal balance, they do an accounting procedure to prepare a finance statement. This game is tested by students. The test results are satisfying testimonials. Students give feedback to simplify and enhance the time efficiency of the games.

The games encompass the longstanding misconceptions regarding accounting research, education, libraries, and continuing education in the field of education. The key issues highlighted were the deficiencies in teaching and the inclination of accounting teachers to instruct and prioritize the needs of pupils, as stated by Jensen and Arrington in 1983. The concerns surrounding promotion, tenure, financial support, and reward systems tend to prioritize research and publishing over teaching. The lack of adequate funding

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and attention towards innovative accounting education and the enhanced role of university libraries as learning hubs is evident. Accounting instructors are failing to adequately prepare students to meet the demands of a constantly evolving business sector, falling behind in their educational approach.

The introduction of accounting innovation began when Singapore established the Master of Business Administration (Accounting) program at the School of Accounting and Business at Nanyang Technological University (NTU) on 1 July 1991. This curriculum was developed in response to the apparent scarcity of proficient managers in Singapore. Innovation is achieved by providing a concise program description, the contextual background of its creation, and a meticulous planning and design process. This effort exemplifies the integration of curriculum creation with elements of marketing and entrepreneurship. This innovation should be considered as it accomplishes three objectives: offering graduate education in business, emphasizing accounting education as a practical area of focus, and fulfilling the needs of accounting professionals in Singapore [24].

Distance learning has unique obstacles when it comes to developing educational advancements. Within the realm of distance education, the selection of technical options becomes paramount, particularly when faced with the decision of allocating resources towards course development or investing in tutors. This is a significant matter, particularly for developing nations that require the formulation of remote education initiatives. Some individuals may allocate significant resources toward the development of advanced virtual courses without effectively maximizing their utilization [25]. This circumstance enhances the deployment of distance education in poor nations. This encompasses a profound comprehension of the specific requirements of the community, shifts in educational models, and astute allocation of resources.

The utilization of digital video technology in accounting education is gaining significant traction in the ever-evolving digital landscape. Numerous accounting professors are capitalizing on the functionalities provided by this digital video technology. Accounting academics are utilizing digital video technology to enhance their teaching methods and use its advantages. In addition to traditional approaches, they include video aspects in their learning strategy [26].

There is a growing emergence of educational games designed to cultivate soft skills, often referred to as pervasive skills. These games are produced with the intention of providing students with the chance to enhance these skills. Utilizing educational games can effectively facilitate a profound and pleasurable learning encounter. At the same time, maintaining a strong emphasis on creating software essential for the professional accounting industry. Therefore, educational games serve as more than just a source of amusement, but rather as a valuable instrument in equipping students with the necessary skills to navigate the intricate and ever-changing realm of employment [27].

At the undergraduate level, a method of evaluation based on projects is employed to improve learning by fostering team innovation. The project necessitates team invention in delivering inventive outcomes, encompassing the evaluation of the team's innovative

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achievements and the contemplation of individual student perspectives on the collaborative process of generating those outcomes. This project aimed to foster collaborative creativity in undergraduate accounting classes. Project-based evaluations aim to enhance students' comprehension of accounting while fostering the development of team creative skills. The project design underwent meticulous analysis to ensure the fulfillment of learning goals and objectives [28].

4 Conclusion

Communication, planning, design, construction, and deployment are all the steps to create a prototype using the waterfall model to develop interactive teaching tools for supplementary material in accounting learning. At the user communication stage, users are evaluated through business observations, interviews with potential users, and literature reviews. The interviews with businesspeople and students showed that they experience difficulties in preparing financial reports, making it difficult to evaluate business results and obtain funding. Planning is created based on user needs and includes activities, schedules, resources, and budgets. In this research, the prototype is designed using iterative prototyping, which means that a series of tests are carried out sequentially to improve the prototype. The product's first version contained all phases of the accounting process, beginning with the transaction simulation by opening the cards, doing money-product exchange, doing production simulation, calculating the ending balance of cash and product, journalizing, and preparing financial statements. Hence, during the users' playtest, it was running out of time to do all phases. So, regarding iterative prototyping, we revised the design by dividing all phases into two levels in the final version: basic level and intermediate level. The journalizing process is transformed into spreadsheet form provided by barcode to maintain time playing consumption. The props are made according to accounting specifications, so these teaching tools can increase learning efficiency, especially in understanding and skills in accounting processes, individually and in groups. We expect that the next research can transform this board game into a digital game for broader usability.

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