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ENTREPRENEURSHIP EDUCATION GAME FOR HIGH SCHOOL STUDENTS BASED ON INDONESIAN NATIONAL WORK COMPETENCY STANDARDS: THE SCENARIO DEVELOPMENT

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Abstract

Entrepreneurship has long been a worldwide concern, as an effort to increase economic and social growth. In 2018 Global Entrepreneurship Development Index (GEDI) data, Indonesia ranked 94th in the world. GEDI measured entrepreneurial scores based on 14 pillars. One of the pillars where Indonesia gets low score was human capital. Education plays a central role in increasing human capital. One of the approaches in entrepreneurship education is to use games. This research aims to develop an entrepreneurship education game for high school students. The game was not intended to generate new ventures, but focused on building students' entrepreneurial interest and introducing entrepreneurship concept based on 27 industrial entrepreneurship competency units of the Indonesian National Work Competency Standards (SKKNI). The game will be narrative-based, in the form of interactive story with branching paths. This article discussed the initial stage of the game development, specifically scenario development. Narrative inquiry methodology was used through three phases: narrative collection, narrative analysis, and scenario building. Since the initial scenario, it has been revised twice through reviews by participants. The final scenario contains of 22 choices, 61 branches, and 10 endings. This scenario would be used to develop dialogs and scenes in the entrepreneurship game.

Keywords: Entrepreneurship Education, Serious Game, Narrative-based Game, Game Scenario Development, Narrative Inquiry

INTRODUCTION

Entrepreneurship has long been a global concern, as an effort to increase economic and social growth in society. In recent years, the role of innovative entrepreneurs has increasingly been considered important in promoting economic development (Crudu, 2019). Empirical evidence has shown that in developing countries, entrepreneurship has made a positive contribution to the economic and social dimensions of sustainable development (Dhahri & Omri, 2018). Based on 2018 Global Entrepreneurship Development Index (GEDI) data (The GEDI, 2018), Indonesia ranked 94th in the world and ranked 17th in the Asia-Pacific, with an overall GEDI score of 21%. GEDI measured entrepreneurial scores based on 14 pillars, as shown in Figure 1 which shows the comparison of scores of each pillar between Indonesia's scores with world and regional scores.



Figure 1. Comparison of Gedi's 14 pillars
Source: (The GEDI, 2018)

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It could be seen that the pillar of networking in Indonesia had a very good score, far beyond the world and Asia-Pacific regional averages. Likewise, product innovation and cultural support in Indonesia were almost on par with the world average. But on the other pillars, Indonesia was still far behind. One of them was the pillar of human capital. Entrepreneurial Human Capital is a complex and multidimensional asset, which is formed from specific skills and specific high-level entrepreneurship levels and knowledge related to various aspects of the business, such as sales, negotiation, product development, and risk assessment (Bosio, Minola, Origo, & Tomelleri, 2018).

Education plays a central role in increasing human capital, including entrepreneurial skills (Bosio et al., 2018; Cooper & Davis, 2017; Azim & Hariri, 2018). Entrepreneurship education influences entrepreneurial behavior and intention (Fayolle & Gailly, 2015; Ferreira, Fernandes, & Ratten, 2017). Therefore it was recommended to be done early on in the entire education system. This initial entrepreneurship education was aimed at creating a good impression about entrepreneurship and motivating students to develop the soft-skills needed to choose this career. In addition, dropout students would benefit because they have learned the foundation to be involved in business (Azim & Hariri, 2018).

In Indonesia, in the 2013 curriculum, entrepreneurship was included in the Handicraft and Entrepreneurship subject for high school students at level X, XI, and XII. Thus, entrepreneurship education becomes compulsory. But unfortunately, in many schools, these subjects received less attention compared to other subjects, especially the subjects for state examinations. Books that support this subject only emphasized aspects of production which include crafts, engineering, cultivation, and processing, even though this production aspects is only a small part of entrepreneurship skills. In addition, the ineffectiveness of entrepreneurship education at the Indonesian high schools was allegedly due to: (1) lack of teachers who become entrepreneurs; (2) entrepreneurs were less concerned about education; (3) lack of public trust in student entrepreneurial products; (4) lack of entrepreneurship lesson hours (Husnaini, 2017).

Preliminary research was conducted by distributing online questionnaire to Senior High School, Madrasah Aliyah, and Vocational High Schools students, to determine the current condition of entrepreneurship education. A total of 137 respondents from 21 schools filled out the questionnaire. The results showed that students' interest in entrepreneurship was still low, 46% of respondents said they did not want to start entrepreneurship after graduation. The lack of entrepreneurship education time was also reflected in the results of the questionnaire, 19.6% had never received entrepreneurship lessons, 23.9% had received entrepreneurship lessons with uncertain times, and 39.1% had received entrepreneurship lessons once a week. According to students, 86% of teachers have entrepreneurial experience, but only 70% can motivate students to become entrepreneurs. Support from schools was also considered insufficient, as many as 65% of respondents stated that the school did not provide adequate facilities to study entrepreneurship. Regarded learning with games, 63% of respondents said they had never use games in learning.

On the other hand, in addition to formal education, efforts to improve entrepreneurial skills were also carried out through competency-based training. As an attempt to improve entrepreneurship training activities, the Industrial Education and Training Center together with small and medium industry entrepreneurs compiled the Indonesian National Work Competency Standards (SKKNI) of Industrial Entrepreneurship Sector. This SKKNI stipulated in Ministry of Manpower and Transmigration Decree No. 53 of 2014. The entrepreneurial competency classification code specified was M.741000, with 27 competency units, as listed in Table 1. Each competency unit has several elements that are each have certain performance criteria. A full description of each competency unit could be seen in the Appendix of the Ministerial Decree.

Table 1. List of Competency Units

No	Unit Code	Competency Unit
1.	M.741000.001.01	Carry out a market survey of a product
2.	M.741000.002.01	Study the production process of a product
3.	M.741000.003.01	Conduct surveys of sources of raw materials and auxiliary materials

4.	M.741000.004.01	Conduct analysis of the break-even point
5.	M.741000.005.01	Determine the type of product to be produced
6.	M.741000.006.01	Calculating investment costs
7.	M.741000.007.01	Determine the number and expertise of the workforce required
8.	M.741000.008.01	Carry out industrial business licensing activities
9.	M.741000.009.01	Carry out the procurement of machinery and equipment needed
10.	M.741000.010.01	Undertake workforce recruitment
11.	M.741000.011.01	Arranging the organizational structure
12.	M.741000.012.01	Making a job description of each personnel
13.	M.741000.013.01	Make work procedures for each task
14.	M.741000.014.01	Make a work schedule for the production department personnel
15.	M.741000.015.01	Supervise workforce performance
16.	M.741000.016.01	Arranging production plans
17.	M.741000.017.01	Develop work plans for the production floor
18.	M.741000.018.01	Carry out the procurement of raw materials and auxiliary materials
19.	M.741000.019.01	Perform storage arrangements for raw materials, auxiliary materials, intermediate products and final products
20.	M.741000.020.01	Conduct warehousing activities of raw materials, auxiliary materials, intermediate products and final products
21.	M.741000.021.01	Checking the types, specifications and conditions of raw materials and auxiliary materials
22.	M.741000.022.01	Supervise the production process
23.	M.741000.023.01	Conduct product promotions
24.	M.741000.024.01	Conducts a survey of retail merchants of a product
25.	M.741000.025.01	Conduct product marketing
26.	M.741000.026.01	Establishing relationships with customers
27.	M.741000.027.01	Perform financial accounting for each transaction

With this SKKNI, it was expected to be a reference for entrepreneurship instructional materials and training programs. In order for formal education graduates to have equal competence, entrepreneurship education in schools should also be referred to this SKKNI competencies.

Entrepreneurship education is a very broad subject. It could be applied in a classroom, workshop, a module, a course, or integrated into the entire program curriculum. It could also be applied to children, school students, college students, professionals, executives, entire companies, or to refugees and immigrants (Gedeon, 2017). Entrepreneurship education has also undergone many changes. Now not only aims to create new businesses, but has been expanded to build entrepreneurial behavior, both in the form of entrepreneurs and intrapreneurs. So it is focused on developing the traits, motivations and interest, knowledge and skills needed to become entrepreneurs (Manimala & Thomas, 2017).

Entrepreneurship education covers a vast area, thus the approaches used are also very diverse. Learning materials that are integrated with technology are currently being used (Rusmono, Winarsih, & Hardiansyah, 2019). Good teaching materials must always follow the development of technology, art and the reality of life in a society that is always global (Hardiansyah, Rusmono, & Winarsih, 2019). One of which is relatively new is serious game. Serious Game is a game (currently typically computer-based) that is designed to improve learning aspects of the players (Almeida, 2017). The use of games for learning increases because it can improve learning outcomes by creating a "flow" condition. In positive psychology, "flow" is a mental condition in which a person engages in activities completely immersed in focus, involvement, and enjoyment (Buzady, 2017). Games are proven to be able to have a significant effect on motivation and participation, especially increasing latent factors such as excitement, ease of use, work flow, and perceived benefits (Matallaoui, Hanner, & Zarnekow, 2017). Learning games are believed to be able to spur learners to learn something with interests, needs and abilities (Kusumandari & Wibawa, 2019).

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The use of games in entrepreneurship education had been carried out in various forms, some are non-electronic, computer based, and online. The game genre was also diverse including simulation (Almeida, 2017; Costin, O'Brien, & Slattery, 2018; La Guardia, Gentile, Dal Grande, Ottaviano, & Allegra, 2014; Newbery, Lean, & Moizer, 2016; Ruiz-Alba, Soares, Rodríguez-Molina, & Banoun, 2019; Shankar, 2016), adventure (Buzady, 2017; De Freitas & Routledge, 2013), board game (Patricio, 2017; Prihadi, Cheow, Yong, & Sundrasagran, 2018), mini games (Bezanilla et al., 2014; Ciusi, 2016; Protosaltis et al., 2013), as well as a combination of various games that were already on the market (Antonaci et al., 2015; Bellotti et al., 2012).

One of the oldest forms of games is narrative-based games. Ranging from text-based adventure, interactive stories, RPGs, to cinematic adventure games. This form of game prioritizes the story in the game. Gameplay is used to make the story more immersive. According to data from www.gamingscan.com, narrative-based games such as RPG, adventure and action adventure, are still much more desirable than the form of simulation. In addition, more than 73% of gamers prefer single player games (GamingScan, 2019). In a survey conducted by Lebowitz & Klug (2011), it was found that almost 70% of respondents pay close attention to dialogue and cut-scenes in the game, and the story really determines whether they will finish the game or not. From observations on the Google Play Store, narrative-based games were still in great demand, such as: Episodes (50M + downloads), Choices (10M + downloads), and Chapters (5M + downloads).

In narrative-based games, players can interact directly with the story in several ways or forms, regardless of whether the interaction has a significant effect on the story or not. This is known as "interactive storytelling". Based on the impact of interaction on the story, interactive storytelling can be divided into six types, namely: (1) Fully Traditional Stories, (2) Interactive Traditional Stories, (3) Multiple-ending Stories, (4) Branching Path Stories, (5) Open- Ended Stories, and (6) Fully Player-Driven Stories (Lebowitz & Klug, 2011).

Fully Traditional Stories (FTS) is a form of game with no interaction with the story at all, for example visual novels. Interactive Traditional Stories (ITS) is a form of game where no matter how much control is given over various aspects of the game, the story cannot change. Examples are Final Fantasy XIII and Lunar Silver Star Harmony. In Multiple-Ending Stories (MES), the ending of a story can be different depending on the player's choices or actions, even though the story plot works the same. Examples include Chrono Trigger and Bioshock. Branching Path Stories (BPS) provides players with a series of choices that can change the plot and end of the story. Examples of such games are Heavy Rain and Detroit: Become Human. Open-Ended Stories (OES) is a more complicated type of BPS, where choices that change the plot or ending are not very clear, and players can determine the ending of the story itself, or even the game never ends. Examples include Fable II and Fallout 3. Fully Player-Driven Stories (FPDS) offer total control to players. The game only provides settings, and players build their own stories in these settings. Examples are The Sims and tabletop RPGs such as Dungeons & Dragons (Lebowitz & Klug, 2011: 121-122).

BPS has many endings, but unlike MES, players don't follow the same path to achieve it. This makes the player have more control in the story. BPS has a rigid decision point structure and story branches. Players can influence the story line through the decisions they take at each point, but the writer controls the story in full for all branches. A good story structure combined with the freedom to choose the story line makes BPS remain in demand today.

In BPS, branches are divided into 3 groups: minor, moderate and major. The minor branch has no influence on the story, and is only useful for giving several different versions of a scene. Although not influential, minor branches can be used to deepen the story, build character, or give guidance to the players. The moderate branch will fuse with the main branch for longer than the minor branch. This allows the player to undergo a completely different scenario but with the same goal. Major branches significantly change the story, and generally determine the end of the story (Lebowitz & Klug, 2011: 185-186). Critical Path is the branches that must be passed by players to be able to complete the game successfully (Heussner, Finley, Hepler, & Lemay, 2015).

1 Branching can only be accessed by players through scenarios. Scenarios can be divided into two, which is narrative scenario and behavioral scenario. Narrative scenario is the form of text and dialog that is displayed to the player. Behavioral scenario is the game reaction to player input (Protopsaltis et al., 2011). The scenario development of a serious game is considered complex as it does not have a linear storyline, yet it rather exists with a dynamic metaplot with the participating player in the unfolding sequence of problems and the interactions made within the game influence the outcomes (Wibawa & Wibawa, 2019).

This research developed a serious game for entrepreneurship education for high school students based on SKKNI in the field of industrial entrepreneurship. The game was not intended to develop entrepreneurial hard-skills or generate a new business, but focused on supporting entrepreneurship education in building student entrepreneurial interest, and introducing the concept of entrepreneurship based on 27 SKKNI competency units. The game is narrative-based, in the form of interactive story with branching paths. This article discussed game story scenario development as initial stage of the game development.

METHODOLOGY

This research is a qualitative research, a development research. In developing the story scenario for this entrepreneurship educational game, the narrative inquiry method was used. With narrative inquiry, researchers can systematically investigate human experiences in the world through stories about what they live (Clandinin, Caine, Lessard, & Huber, 2016; Webster & Mertova, 2007).

The phases taken to develop game scenarios through narrative inquiry were as follows:

1. Narrative collection

The stories that was used as the basis for making game scenarios, came from two sources, document sources and entrepreneurs experience. The document sources were obtained from SKKNI Industrial Entrepreneurship. 27 competency units of SKKNI for Industrial Entrepreneurship Sector indicate the standardized steps needed to start and develop new industrial business. The source of entrepreneurs' experience stories, obtained from in-depth interviews with four entrepreneurs. Entrepreneurs were chosen based on the following criteria: (1) Have a micro or small business scale; (2) The business has been running for more than two years; (3) One entrepreneur for each type of industrial business, namely crafts, engineering, cultivation, and processing industries.

2. Narrative analysis

The narratives that have been collected were transcribed verbatim, then analyzed. The analysis was done manually without using software. The analysis was conducted based on two types of Polkinghorne's analysis: analysis of narratives (paradigmatic mode of analysis), and narrative analysis (narrative mode analysis) (Kim, 2016: 196). Paradigmatic mode is to analyze narratives from various sources to find similarities that can be categorized into certain themes so that they can be generalized. Narrative modes focus on events, actions, and other data elements, organize them in a storyline, fill in the gaps between events and actions using narrative smoothing, and create stories that highlight important life experiences (Kim, 2016: 196-198).

3. Scenario building

The story scenario for the game built based on the results of narrative analysis in the form of branching stories with multiple endings. The results were asked for review and approval from participants.

RESULT AND DISCUSSION

The main document as narrative source was the Appendix of the Minister of Manpower and Transmigration Decree No. 53 of 2014 concerning the Establishment of Indonesian National Work Competency Standards (SKKNI) for Industrial Entrepreneurship Sector. The appendix consists of 88 pages that explain this SKKNI. It includes, inter alia, the background of SKKNI conceptualization, competency standard mapping, list of competency units, and a description of each competency unit. The description of the competency unit describes the competency elements along with the performance criteria for each element, the boundary of the variable, and the assessment guide. The story sequence

¹ developed from this document was obtained from the competency map, as illustrated in Figure 2, enriched with competency elements and performance criteria.

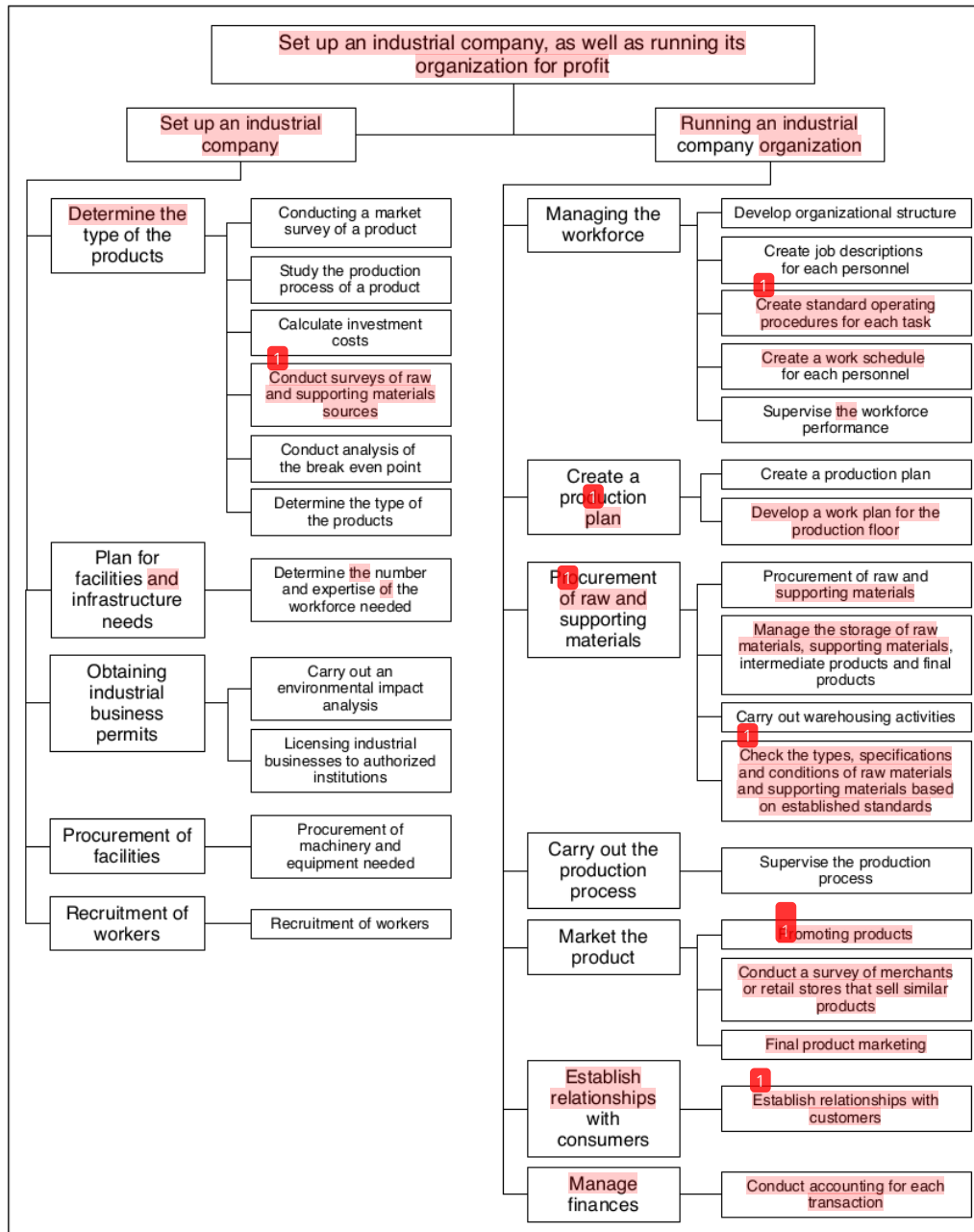


Figure 2. Competency Map of the SKKNI of Industrial Entrepreneurship Sector

In-depth interviews to obtain the story of entrepreneurs, were carried out to four entrepreneurs. The following are the profiles of these entrepreneurs. The first was Fahmi, owns a chicken nugget processing

1 industry. The specialty of the product is the percentage of chicken meat more than similar products on the market, thus guaranteeing a better taste, and produced with natural ingredients without preservatives. Product marketing is done through a network of vegetable stalls which cover several sub-districts in the Bogor and South Tangerang regions. For the handicraft industry, the entrepreneur interviewed was Eva. Eva owns a women's accessories industry business, such as necklaces, bracelets, brooches, and others. Its products have been marketed nationally, and have even participated in various international exhibitions. As a cultivation businessman, Sony was chosen, the owner of the betta fish cultivation industry. His betta fish are marketed through a network of ornamental fish retailers in Jakarta. And the last was Rangga, as a software engineering entrepreneur, who has produced several software for school management and financial management.

The interview was conducted with an open question asking the entrepreneurs to share their experiences since starting the business until now. Interviewers were provided with interview guides made based on 27 competency units of the SKKNI of Industrial Entrepreneurship Sector. That way, the interviewer could stimulate participants' stories and dug deeper into their experiences in accordance with the activities in the 27 competency units. The entire interview session was recorded using a voice recorder.

The recorded interviews were transcribed verbatim manually. The results were printed for further analysis.

The sequences from SKKNI of Industrial Entrepreneurship Sector was developed into the initial scenario draft. This scenario consists of 27 parts, in accordance with 27 SKKNI competency units. For example, in Figure 3, the scenario for the "Investment Cost" section is displayed. This scenario draft acted as the game core. Game core is an important element needed to make a game. That allows game designers to reflect on their concepts and critically evaluate their ideas by identifying game elements that are important for the learning experience they want to design (Kalmpourtzis, 2019).

Thus, this scenario draft would act as a direction for the next processes in the game making. However, along with the development of research, data analysis, and feedback received from the prototype, some elements could be changed. In other words, it was a hybrid core, a game core which can still be changed in several aspects according to the feedback received (Kalmpourtzis, 2019).

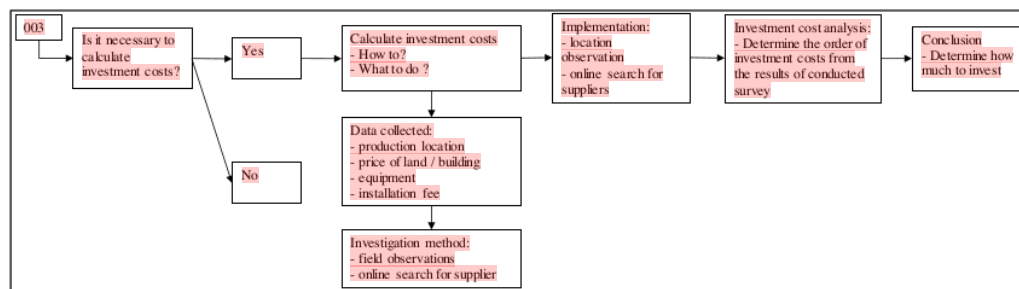


Figure 3. Scenario Draft of the "Investment Costs" Section

Narratives from the transcriptions of interviews with four entrepreneurs were analyzed in two stages. The first stage was the paradigmatic mode of narrative analysis. In this stage, the narratives were categorized and grouped according to the 27 parts of the scenario draft. The analysis was done manually, by marking the transcriptions with color codes. Such an approach, by Riessman (2005) is referred as thematic analysis. The emphasis is on narrative content, rather on what was said than why it was said. The thematic approach is useful for finding similar themes or events among the stories of several participants (Riessman, 2005).

In the second stage, an analysis of narrative mode was carried out. This stage was carried out in three steps. The first step was to arrange the storyline or plot. During interviews, participants often told stories in no order. Researchers would find that interview transcripts are irregular records that need to be

¹ arranged in a series of chronological events (Nasheeda, Abdullah, Krauss, & Ahmed, 2019). This chronological sequence of events is called a storyline or a plot. The plot functions to turn the list of events into a scheme by highlighting the relation of certain events to the development of the story. Without this connection, each event will emerge disjointed and fragmented and its meaning will be limited to the identification of its category (Polkinghome, 1988). To be able to arrange the plot, the narrative must be analyzed by identifying three elements, namely time, place, and event (Webster & Mertova, 2007).

The second step was to reshape the story according to the plot. This step required good collaboration with participants (Nasheeda et al., 2019). The researcher and participant examined the rearranged storyline together. Does this plot describe their true self? Clarification from narrative sources is important because in narrative-based research, validity refers more to how well results are supported by data that has been collected (Webster & Mertova, 2007). Gathered the facts, then put them in the right order, was not enough. The narrative will most likely contain an empty gap between the stories, and researchers must fill it (Polkinghome, 1988). This process in (Kim, 2016) was called narrative smoothing.

The final step in this stage was to re-clarify that the final narrative was really in accordance with reality and could meet the researcher's needs. The researcher checked whether the final narrative includes 27 parts of the initial scenario draft that became the core game. The researcher also asked the participant to reread the entire narration from beginning to end and gave his agreement that the narration was in accordance with his/her life story.

Based on the initial draft scenario and the complete narratives of the entrepreneurs, game scenarios could be built. One important element in game design is to build game world. Each game has its own world that is a unique game space with certain attributes, possibilities, and restrictions. Game world creates opportunities for players to learn, so game world must be designed to suit learning objectives (Kalmpourtzis, 2019).

It has been mentioned above that the learning objectives to be achieved by using this game were to build entrepreneurial interest in high school students, and to introduce the concept of entrepreneurship based on 27 SKKNI competency units. The world considered appropriate to describe it was the world of college students starting their new business. High school students who would use the game were expected to be able to imagine themselves after graduating from school and entering the world of college, while also pioneering their entrepreneurship. The entrepreneurs featured were on a micro scale. By making settings like this, it was hoped that players would feel that the role they play was very close to their current condition, so they were motivated to follow it.

Besides setting, another important element of game world is persona. Persona is a fictional character that represents the player in the game. Persona must be designed realistically, as close as possible to the player (Kalmpourtzis, 2019). In this game, the main persona were four early year college students. Two men and two women. All four were from families with middle income level, such as the majority of Indonesian society.

The initial scenario draft was changed in such a way using the narratives of the entrepreneurs to be closer to reality. Several sections were combined and the sequence was adjusted. In addition, the scenario was also adjusted to the game world that has been designed. With so many possible storylines to choose from, the right form of story to use was the branching path story (BPS). Games with nonlinear stories can be powerful learning tools. Games like this can encourage players to explore and experiment (Kalmpourtzis, 2019). This kind of game also allows multiple endings. Multiple endings can increase the "illusion of player freedom" (Solarski, 2017).

The revised scenario contained 22 choices, split into 61 branches, and had 10 endings. Branching used a parallel structure pattern to ensure the story content can still be managed properly. In parallel structures, branches of the story can be reunited at certain points (Solarski, 2017). Ending was divided into three groups: one successful ending, 3 fairly successful endings, and 6 failed endings.

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This scenario was then brought back to the four entrepreneur participants for review. In this session, participants were invited to explore the scenario, to examine each option and branch, and to evaluate the endings. Their opinions were collected and there were a number of minor revisions made in accordance with those opinions. The final scenario still contains 22 choices, 61 branches and 10 endings. The structure of the final scenario in the nodes form could be seen in Figure 4. In the picture, the star symbol indicated an ending.

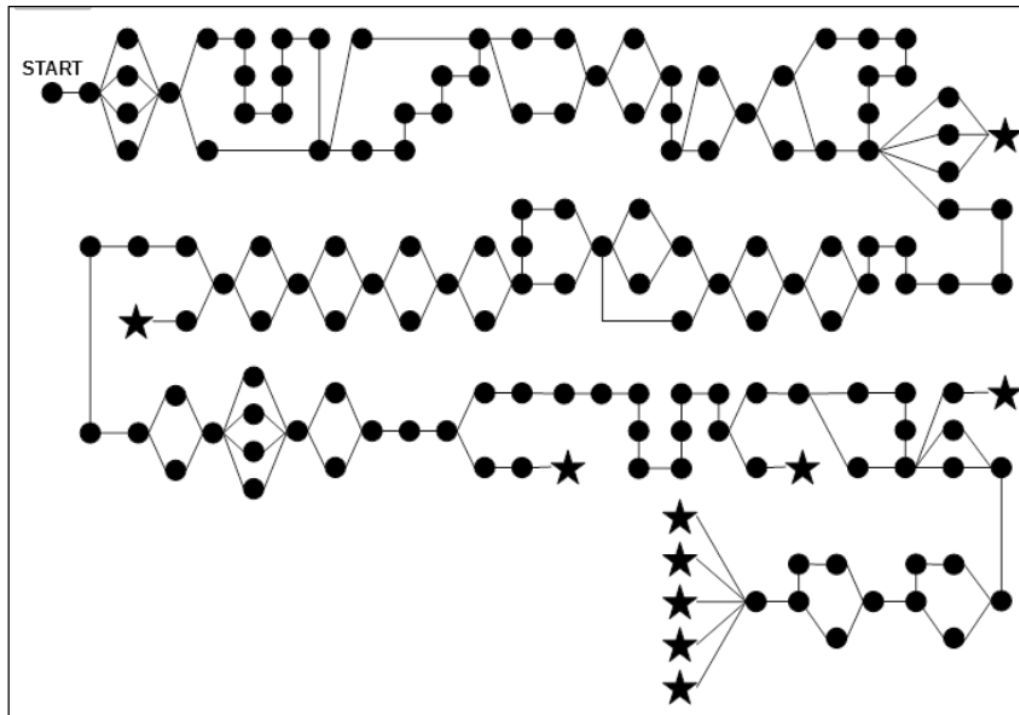


Figure 4. Final Scenario Structure

CONCLUSION

A more targeted approach to entrepreneurship education is urgently needed along with the increasing need for entrepreneurs. For high school students in particular, this is becoming increasingly important given the compulsory entrepreneurship education. This research proposes a novel approach, which not only has a goal to increase student entrepreneurial interest, but also provides knowledge about the concept of industrial entrepreneurship according to competencies that have been standardized in the SKKNI of Industrial Entrepreneurship. The proposed approach uses learning tools in the form of narrative-based games with branching paths. This article shows how the narrative inquiry method was used to construct game story scenarios. The final scenario developed contains 22 choices, splits into 61 branches, and has 10 endings.

For future works, this scenario can be used to develop dialogs and scenes in the entrepreneurship education game that will be built.

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