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Gastronomy Game Board Project Based Learning in Higher Education

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ABSTRACT

The project-based learning approach is an effort to eliminate student boredom in learning during the Covid-19 pandemic. Project-based learning or known as project-based learning is learning that trains students to get hands-on experience through learning media that is adapted to the material in the syllabus. The purpose of this study was to determine the effect of the project-based learning model on the evaluation and learning achievement of students in the knowledge of materials, tools and cooking methods class aimed at tourism education students who contracted this course. The data collection method in this study was observational data and surveys using a questionnaire. With 37 questions distributed via google form to 4th semester tourism education students randomly as respondents. The survey results show that there is a strong influence of the project-based learning model on the achievement of lecture learning. It is also known that project-based learning is able to increase student involvement in group work and original thinking in project development carried out during learning.

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1. INTRODUCTION

Education has a very important role, including being able to improve the quality of human resources, must be able to produce individuals who have extensive knowledge, highly competitive power, creativity and good attitude so that the quality of human resources will increase. As stated in Indonesian Law No. 20 of 2003 concerning National Education System

that the government must strive to develop capabilities and shape character to develop potential to become intelligent, creative, broad-minded human beings for the nation and state. The Covid-19 pandemic poses challenges for the world of higher education in Indonesia, especially in hospitality field. The Covid-19 pandemic negatively affected traditional face to face teaching practices and students learning, change is needed to ensure that hospitality educator competency deliver the curriculum in ways relevant to students (Smith, 2021). The common response of Covid-19 pandemic emergency learning is the transition from face to face class method to online learning systems (Babbar & Gupta, 2022; Grek & Landri, 2021; Murphy, 2020). The students face major challenge with distant learning as face-to-face communication is more conducive to the learning process, presenting a better environment to sharing knowledge and more interactive in class (Miliszewska, 2007).

There are barriers in developing online learning environment, such as inadequate hardware and software, slow internet connections, learners' procrastination, lack of technical expertise among the instructors, insufficient orientation for learners, and a lack of release time for instructors to develop and design their online courses (Nkonge & Gueldenzoph, 2006). Other factor of student boredness in following the subject if it is done using the usual expository method in online learning. Distant classroom management during the Covid-19 pandemic with various approaches through changes in learning outcomes that are more simplified, updated teaching materials, the use of digital media in teaching materials, as well as other approaches in the learning model. To successfully transition from traditional pedagogy to active online learning pedagogies, faculty members may need to alter their teaching styles used within their traditional offline classroom, and embrace new skills to effectively reach the distant learners (Johnson, 2008; Panda & Mishra, 2007). The effectiveness of learning in higher education is based on leaners' perceptions of learning outcomes and learner satisfaction, primarily, across different pedagogies and assessment tools. Online models of education does not address completely the needs of students concerning their skill development and the learning expectations from the education stream they pursue in their intellectual journey. The interactive learning mode enforces peer interaction, which helps learners gain confidence, assess themselves and improve their deficient skill sets (Garg, 2020).

Knowledge acquisition, critical thinking and problem-solving ability are the major skills of learners in higher education. To achieve 21st Century Skills, higher education will prepare students with both hard skills, especially cognitive knowledge and professional skills(Vogler et al., 2018), and also soft skills, such as problem-solving, teamwork and communication (Liu et al., 2014). These skills will not easy to be achieved with traditional learning methods where teachers are source of the knowledge for students (Weiss & Belland, 2016). Learning in a higher education is a process of active understanding and building up of meanings and skills, what fully complies with the main activity of project-based learning (PjBL) (Lasauskiene & Rauduvaite, 2015). Different from traditional teacher centered teaching methods, PjBL put students' personal interests and needs at the center of learning process, and emphasizes student roles (Blumenfeld et al., 1991). Project based learning is one way to increase interest in learning to increase the potential that exists in students. Instead of using a single output standard that is necessary for all students, PjBL recognize that each student has unique interests, learning styles and perspectives which need to be tended to in order to achieve optimal learning (Kokotsaki et al., 2016). Project based learning is a learning method designed by using problems that can be directly practiced so that students can understand them. PjBL as a learning process that is focused on projects that engage students in investigation. It allows students to learn by pursuing solutions through asking questions, debating ideas,

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designing plans, and communicating with others. PjBL is a typical variation of collaborative, inquiry-based learning, characterized by active engagement of students and inductive learning In the project learning approach, learners are divided into groups of different sizes. All learners have equal roles and responsibilities in carrying out the project. The PjBL allows the learner to realize a concrete project by developing his creativity and respecting his style of learning (Loyens et al., 2015). Six hallmarks of PjBL, including a driving question, the focus on learning goals, participation in educational activities, collaboration among students, the use of scaffolding technologies, and the creation of tangible artifacts. PjBL is an inquiry-based instructional method that engages students in knowledge construction by having them accomplish meaningful projects and develop real-world products (Brundiers & Wiek, 2013). The essential components of PjBL are the critical question that drives student activities and the output product formed by students in response to the driving question (Choi et al., 2019). The creation of products is of importance because it helps learners to integrate and reconstruct their knowledge, discover and improve their professional skills, and increase their interest in the discipline and the ability to work with others. In other words, the final products are the concentrated expression of various competencies that students may develop during PjBL (Guo et al., 2020).

Knowledge of ingredients, tools and cooking methods course is learning about the field of gastronomy and culinary arts. This course delivered with team teaching class. Team-teaching refers to two or more teachers working together at a certain level of collaboration in the planning, delivery, and/or evaluation of a course(Chang & Lee, 2010), which principally involves sharing of teaching expertise and reflective dialogue. In this course, the lecturers introduce PjBL in their "main courses," as students can then be expected to have better learning outcomes than seen with Traditional Instruction Method. Teachers can first identify what topics reflect important concepts and essential information that would be taught through lectures, and then incorporate these into projects. The learning materials taught include food ingredients, spices, equipment, machines and cooking methods. Project based learning learning models can be practiced in student learning in the Knowledge of Ingredients, Tools, and Cooking Methods course to encourage complex learning for students, where students will be given the opportunity to learn more actively by being encouraged in the process, asking questions, researching, and learning how to solve existing problems. Furthermore, students will learn how to explain the results of their research and the products they make. If this learning method is prepared and implemented properly, the results obtained can also be comparable and in accordance with the objectives achieved. When team-teaching using the PBL approach, two intertwined processes could be observed among the student-teachers: the sharing of personal experiences with other team members on a regular basis and the persistent reflection on and interpretation of their personal feelings during these interactions with their peers (Muchnik-Rozanov & Tsybulsky, 2019).

The project-based learning developed in the Knowledge of Materials, Tools and Cooking Method course at the tourism education study program at the University of Education Indonesia adapts knowledge-building skills into the gamification learning model. Where the tourism education study program aims to equip students who will become prospective tourism teachers, with the hope that graduates will have skills in processing knowledge material into teaching materials in various forms. One of them is in the form of educational games that hold the principle of Game Based Learning. Game Based Learning is a type of game play that explains lessons as a result of game play. Learning-based games are designed to balance learning material with playability. This is an era where students have been surrounded by technological sophistication. So that some schools are now also

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recommending teachers to adapt to technology to meet the needs of students. Some universities have even started using digital games as a means to study in lectures. There are several types of computer games that are successfully used in the classroom environment to enhance the learning experience of students. Some games are available at some study centers, and others provide lessons for personal interaction and feedback that are more specific to a particular study. Games are one of the learning media that can help or facilitate lecturers in delivering learning material so that it is easily accepted by students. The use of media aims to make learning more effective and efficient and can improve quality. In order for the use of media to be maximally successful, selection of learning strategies and media should be able to attract the attention of students to be involved in learning in a fun context. Concrete learners enjoy learning strategies that use games, pictures, films, cassettes, videos, and others. With games, students can learn while playing and interacting with one another. With games, they can be encouraged to learn optimally in a participatory manner in individual activities, in pairs or small groups, they actively discover the concepts of the language being taught which are packaged in the form of games. In such a fun learning situation, children can be optimized in learning new knowledge or skills, so that learning objectives can be effectively achieved (Anderson & Maninger, 2007). Game-based learning in the modern and digital era currently prefers to use computer and gadget media because it is more practical. However, the use of computers is often a solitary task, namely isolating students on certain tasks (on devices) so that in the end it can damage their social interactions. For this reason, we need a platform that can bind students in a collaborative and competitive game such as a game-based learning platform which is a game application that allows students to follow game-containing material in the classroom. One of the main goals of this game is to increase students' motivation to pay attention and take the initiative to take notes on the material taught by the teacher in the classroom before they finally face the evaluation test.

Boardgame is one of the conventional non-electronic games that is still quite popular today. This is because the boardgame has a lot of interesting variations both in terms of how to play and also the genres offered. This game can be aimed at educating as well as being a fun entertainment facility to be played anytime by students. In making it must consider the age of the player because this is related to the level of difficulty of the game. Educational games such as board games can help students achieve learning standards in a more fun way. Learning by using games can create a fun learning atmosphere, reduce boredom, and reduce pressure. Board games can improve students' social skills because they allow students to practice skills such as cooperation, taking turns learning, sharing, managing emotions, and also understanding other people's views through the rules embedded in the game.

The project-based learning model by raising the project of making educational games with a background of knowledge of food raw materials, spices, equipment, machines and cooking methods, shows that students respond quite well to the learning methods that are applied. It is evident from the quite innovative and creative educational game ideas produced in the student's final project. However, these indicators have not provided information on the success of project-based learning class model management in achieving learning outcomes for lectures. Based on this rationale, the purpose of this study is to find out how much influence this project-based learning model has in achieving learning outcomes for the Knowledge of Materials, Tools and Cooking Method course. This article will also provide a narrative about how lectures with a project-based learning model approach are carried out in the tourism education study program at the Indonesian Education University for one semester to provide documentation of the development of online learning approaches carried out during the Covid-19 pandemic in Indonesia. It is hoped that this article not only

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can contribute to learning innovation in the field of tourism education in Indonesia and also in the world. This research is expected to provide documentation on how project-based learning management is carried out at the university level by raising the theme of educational games in the field of gastronomy. Where often, tourism education has been managed with an expository approach for types of theory and concept courses and managed with practicum for subjects that are vocational skills. While the current demands for education management that must adopt High Order Thinking Skills in academic universities require education management that can give birth to new innovations, and especially for the implementation of tourism education which aims to produce educators, innovations need to be carried out in the field of education. One of them is the innovation of learning media in the form of this educational game.

2. METHODS

The data in this study are primary data consisting of documents related to lectures such as lecture learning plans, teaching materials, lecture observations, assessments and surveys conducted directly with the respondents being students participating in the Knowledge of Materials, Tools and Cooking Method lectures. During one semester the class is observed by researchers who act as well as lecturers for the course. The things that were observed were student attendance during lectures, activity in online classes, student responses to digital teaching materials, active student communication during assignment consultations, and the results of assignments and exams.

The type of qualitative data in this study consisted of data from observations and documentation studies. The purpose of this qualitative data is to see the effectiveness of the implementation of lectures based on the subjectivity of the researcher who is a lecturer in charge of class. Meanwhile, quantitative data is used to measure the effect of this project-based learning model on the learning outcomes of lectures. If the effectiveness of lecture learning outcomes is influenced by this project-based learning model, and the effect is positive, it can be concluded that this project-based learning model is quite effective for use in learning at the university level.

The survey conducted on students participating in the Knowledge of Materials, Tools and Cooking Methods class aims to determine how the project-based learning method influences the learning outcomes of lectures. This can measure the effectiveness of the project-based learning model in lectures. A total of 12 indicator questions that represent the project-based learning model of students during lectures, and as many as 25 indicator questions that represent the learning outcomes of lectures. This survey was distributed to 74 students, with only 69 respondents participating in the Knowledge of Ingredients, Tools and Cooking Methods class using the google form survey instrument. The Likert scale is used in this survey by measuring the degree of agreement of students with the statements contained in the survey. The survey was held at the end of the lecture in May 2021. Validity and reliability tests were carried out to test the quality of the survey instrument used. Because the data is ordinal, the quantitative data analysis method used is Rank Spearman correlation analysis. Data were analyzed using SPSS version 25 software.

Table 1. Research variable and indicator

Project Based Learning Model (X)	Learning Outcome (Y)

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- Understand the basic issues of project-based learning
- Understand the purpose of project-based learning
- Obtaining information
- Developing the concept
- Develop assumptions
- Using a personal point of view
- Making interpretations
- Understand the implications
- Formulate a problem
- Make an initial solution to a problem
- Create alternative solutions
- Deep understanding of a problem
- Able to think fluently
- Able to think flexibly
- Able to think original
- Able to think in detail
- Able to think evaluatively
- Feeling challenged
- Feeling excited
- Feeling gain new understanding
- Feel like getting a new skill
- Feeling able to present the results
- Mastering the theoretical concepts of lectures
- Mastering the concept of lecture practice
- Able to apply logical, critical and systematic thinking
- Able to apply creative and innovative thinking
- Able to work independently in quality and measurable
- Able to make the right decisions
- Able to maintain and develop communication patterns with lecturers
- Able to maintain and develop communication patterns with colleagues
- Able to be involved in group work process
- Able to supervise in the group work process
- Able to be responsible for the achievement of group work results
- Able to carry out the self-evaluation process
- Able to document, store and retrieve data
- Able to avoid plagiarism
- Able to avoid cheating

3. RESULTS AND DISCUSSION

3.1. Learning Plans and Outcomes of Knowledge of Cooking Ingridients, Tools and Methods Course

The learning process planning is prepared for each subject and presented in learning plans that are determined and developed by the lecturers independently or together in a group of expertise in a Gastronomy field in the study program. Other terms referred to include Semester Learning Activity Program Plans (RPKPS), Lecture Guidelines, or Lecture Contracts. In this study, the term used for learning plans is RPS in accordance with Indonesia Education Ministry Rules (Permenristekdikti) No. 44 year 2015. Lecturers prepare RPS referring to specific descriptions of study programs and outcomes of study programs graduates, as well as study program curriculum. Article 12 Paragraph (1) Permenristekdikti No. 44 of 2015 states, the learning process is based on the RPS which is prepared for each subject. Furthermore, Article 12 Paragraph (3) states that the RPS shall at least contain (1) the name of the study program, the name and code of the course, semester, credits, the name of the supporting lecturer; (2) the learning outcomes of graduates charged to courses; (3) the final capabilities planned at each learning stage to meet graduate learning outcomes; (4) study materials related to the capabilities to be achieved; (5) learning methods; (6) student learning experiences that are realized in the form of job descriptions that students must do for one semester; (7) criteria, indicators, and assessment weights; and (8) a list of references used.

The preparation of RPS in the subject of knowledge of materials, tools and cooking methods is made by course lecturers to present the design and presentation of lecture objectives, lecture materials, teaching materials, and evaluation of the learning processes. With the RPS, every lecturer in providing lecture material can be guided by the RPS he made, so that the process of giving lecture materials can run well and smoothly in accordance with the goals set. In preparing the RPS (Semester Learning Plan) several things that need to be

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considered are: must identify the courses to be taught (including; Course Name, Course Code, Study Status, Study Level, Semester/Academic Year, Department/Study Program, Faculty of Higher Education, Prerequisites, and Number of Credits), describes the benefits and objectives of the course, describes the lecture strategy (consisting of Details of Lecture Materials for each Meeting, methods of presentation and control, evaluation, course resources and aids). Then the description is filled into the document that has been provided and implemented by the lecturer in carrying out the lecture according to the document. The purpose of preparing the RPS is for each lecturer to carry out the learning process more responsibly, in order to achieve the standard of the learning process as mandated in the National Education Standards. By compiling this RPS, students know what to prepare and do in following the relevant courses and can achieve the learning outcomes that have been set. Description of the course on knowledge of materials, tools and cooking methods, namely this course discusses knowledge of ingredients, equipment and cooking methods. Is a basic course in the field of tourism, especially for knowledge in the field of gastronomy and culinary art. The materials taught are related to food raw materials, spices, herbs, equipment, machines and cooking methods. The methods used are online lectures, questions and answers, discussions, gamification learning, and learning videos.

Table 2. Topics for Lectures on Knowledge of Ingredients, Cooking Tools and Methods.

Meetings	Course Meeting Topics
1	Introduction to Knowledge of Ingredients, Tools and Cooking Methods
2	Knowledge of Carbohydrate Raw Materials
3	Poultry Protein Raw Material Knowledge
4	Knowledge of Meat Protein Raw Materials
5	Knowledge of Fish and Seafood Protein Raw Materials
6	Knowledge of Vegetable and Fruit Raw Materials
7	Knowledge of Spices and Seasonings
8	Midtest
9	Knowledge of Kitchen and Equipment
10	Food Processing Machine Knowledge
11	Knowledge of Cooking Methods
12	Evaluation of Team Project Based Gamification Learning
13	Review of Lecture Materials
14	Making Project Class Youtube Program Gastro Club Season 1
15	Making Project Class Youtube Program Gastro Club Season 2
16	Final Test

The implementation of the RPS on the lecture material is carried out by the lecturer in charge of the course. Almost all study programs have carried out lectures that refer to the RPS so that it can take place in a systematic and planned manner in accordance with the agreements made by lecturers and students in the lecture contract or RPS. The learning process is carried out using various learning methods that develop higher-order thinking skills (HOTS) by utilizing various learning resources.

The suitability of learning methods with learning outcomes is carried out through several learning methods with learning outcomes. The selection of forms and learning methods is based on the necessity that the expected abilities have been determined in a learning stage in accordance with student learning achievements, learning methods implemented in the subject knowledge of materials, tools and cooking methods, including: Application of Project Based Learning (PjBL) methods, learning methods in the subject of knowledge of ingredients,

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tools and cooking methods have carried out several learning processes that involve the use of guest lecturers from other universities and representatives from the Indonesian Chef Association in assessing the results of the application of games board learning in problem solving related to course learning outcomes, namely; Understand cooking raw materials, understand cooking utensils, understand cooking machines, understand cooking methods, be able to compile reports, be able to make learning videos, be able to make presentations and be able to make learning media, especially in making educational games about cooking ingredients, tools and methods.

3.2. Management of Lectures on Knowledge of Ingredients, Tools, and Cooking Methods Course

Due to the Covid-19 Pandemic, the Knowledge of Materials, Tools and Cooking Method lecture meetings are conducted completely online using the Zoom Meeting application. Classes are managed using Google Classroom, followed by 74 level 2 students of the Tourism Education study program, Universitas Pendidikan Indonesia. Lecture meetings total 16 meetings including midterm and end-of-semester exams. Classes are held in the even semester 2020/2021 every Tuesday morning, starting from February to June 2021.

Lecture material Knowledge of Materials, Tools and Cooking Methods covers knowledge of raw materials containing carbohydrates, raw materials containing meat protein, raw materials for vegetables and fruit, spices and herbs, cooking utensils, and cooking methods. Teaching materials are delivered with slides and teaching videos. Teaching materials are displayed by lecturers by uploading them on the Google Classroom Classwork page. Occasionally information and discussions are posted on the Google Classroom Stream page. Because it uses a team-teaching system, teaching is held alternately by two course lecturers.

Table 3. Grades of Students in the Knowledge of Ingredients, Tools and Cooking Methods Course.

Grade	Number	Percentage
A	15	20%
A-	18	24%
B+	29	39%
B	9	12%
B-	3	4%
C	0	0%
D	0	0%
E	0	0%

The assessment of lecture participants is based on the value of the mid-semester exam, end of semester exam, student activity and attendance in class, quiz scores and assignment scores. The assessment is calculated using Microsoft Excel software. The exam is held through the spot, which is a learning management system owned by the Indonesian Education University. The structure of the exam questions is 40 multiple choice and 5 Essay questions. Recording of student activity and attendance in class using Google Form software. Student assignments consist of filling out weekly logbooks also midterm and final term assignments. The main assignment of midterm is a report on the development of an educational board game, while the main task of final term is a teaching video whose topic is adapted to the Knowledge of Materials, Tools and Cooking Methods lectures.

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3.3. Assigment of Project in Knowledge of Ingredients, Tools and Cooking Methods Course

The group assignment project in the Knowledge of Materials, Tools and Cooking Methods course is to make educational games in the form of board games whose themes are related to lecture material. Each group is divided into a theme according to the topic of the lecture, there is a group that raises games related to the knowledge of carbohydrate food ingredients, meat protein, poultry protein, fish protein, vegetables and fruit, cooking utensils and others. The duration of the project is 12 weeks.

In the process of working on this group assignment, weekly logbook reporting is carried out as a means of monitoring lecturers in the progress of their duties. Every week each group must consult with the lecturer according to the logbook stages carried out. Lectures act as mentor that help each group with the weekly outcome plan that reported in logbook. Constant participation of a mentor to deal with times when the students do not feel confident or when they feel unable to take on the responsibility for the process. The expert on process can methodically support the team during the work on the problem, as well as help them with cooperation and competently intervene as appropriate, especially in case of potential conflict. It would also be worth devoting more time to team integration, and to run additional workshops on team building and effective organization of work.

The first week's logbook contains topic selection and the reasons for choosing the topic. The second week's logbook contains preliminary research consisting of a literature review, precedents/examples of educational games that have ever existed, to the initial idea of developing educational games. The third week's logbook contains the development of game rules. The fourth week logbook is the initial design development. The fifth week of the logbook is an advanced design development. The sixth week of the logbook is a mock up product production plan. The seventh week of the logbook is the production of product prototypes. The eighth week logbook contains product testing on target users and user experience.

Reports from this task are in the form of prototypes, final reports and scientific articles. The final report contains a collection of weekly logbooks, processed user survey results, game designs, conclusions and bibliography. While the 15-page scientific article contains abstracts, introductions, literature studies, research methods, results and discussions, conclusions and bibliography. In week 12, a game concept assessment was also held which was developed by bringing in expert speakers in the field of games from Binus University and food experts from the Indonesian Chef Association. The research variables were knowledge of raw materials, cooking tools and methods, educational games, suitability of task instructions, and creativity and process. The indicators used in the assessment are the content of knowledge of raw materials, cooking tools and methods in the game, how to deliver the material in the game, the truth of the material according to theory, game rules, suitability of the difficulty level of the game with the target user, uniqueness and authenticity, completeness of tasks, quality presentation, game design quality, development process and teamwork.

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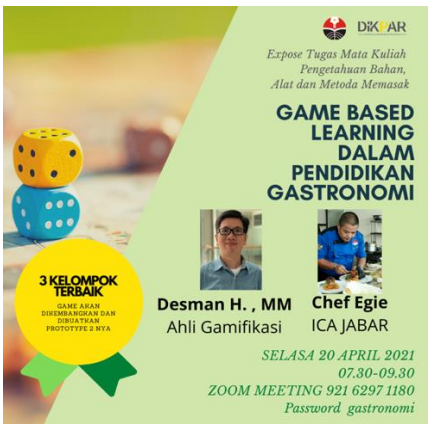

Figure 1. Poster expose assignment course knowledge of ingredients, tools and cooking methods.

A total of 15 groups made a presentation at the end of the project assignment for making educational games with the theme of knowledge of ingredients, cooking tools and methods. Group 1 took the topic of Serelia Series, which is a card game with the theme of knowledge of food raw materials based on cereal carbohydrates. Group 2 took the theme Cook Yuk. Group 3 took the theme of Asian Cooking Seasonings. Group 4 took the Poultry theme. Group 5 took the theme of Basic Indonesian Cuisine Seasonings. Group 6 took the theme of Cooking Method. Group 7 took the theme of Western Cuisine Basic Ingredients. Group 8 took the theme of Go Games. Group 9 took the theme of Food Processing Machines. Group 10 took the theme of Guessing Cooking Equipment. Group 11 took the Fish Games theme. Group 12 took the Dikpar Kitchen Escape theme. Group 13 took the theme Herb & Spices Learning Media. Group 14 took the theme of Indonesian Traditional Cooking Equipment. Group 15 took the theme Balls of Shellfish. The three groups with the highest score were Herb & Spices Learning Media with a score of 97, Masak Yuk with a score of 95 and Go Games with a score of 95.

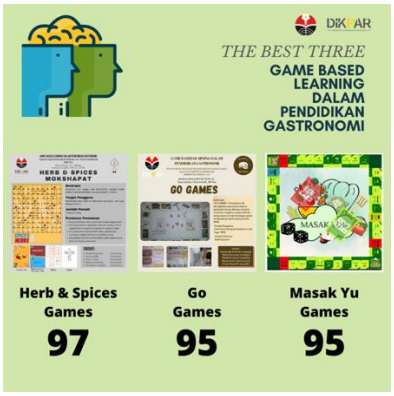

Figure 2. The best three board games project score.

3.4. Analysis of the Influence of Project Based Learning Learning Models on Student Learning Achievements in Knowledge of Ingredients, Cooking Tools and Methods Course

The validity test was carried out to determine the measuring instrument (questionnaire) used was appropriate or suitable for use in research. After testing the validity with the help of SPSS software, valid data is generated. This means that the designed questionnaire can be used according to its size function, or in other words it can provide measurement results that are in accordance with the meaning and purpose of the measurement.

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Reliability test was conducted to measure the level of consistency of the questionnaire used in measuring the same symptoms. After testing the reliability with the help of SPSS ver.24 software, it was found that the questionnaire used had a high level of reliability. This means that the questionnaire can measure the same symptoms and the measurement results are relatively consistent.

Normality test was carried out using the Kolmogorov-Smirnov test. With the help of SPSS software, the data used in this study was normally distributed. This normality test was carried out with the intention of checking the distribution of the data used. With these results, the data used has met these assumptions.

Table 4. One-sample Kolmogorov-smirnov Test Result.

		Unstandardized Residual
N		69
Normal Parameters[a,b]	***Mean***	.0000000
	Std. Deviation	3.87415671
Most Extreme Differences	***Absolute***	.100
	Positive	.069
	Negative	-.100
Test Statistic		.100
Asymp. Sig. (2-tailed)		.086[c]

a. Test distribution is Normal.
b. Calculated from data.
c. Lilliefors Significance Correction.

The correlation test that has been carried out on the data has an r value (correlation) of 0.828. This means that project-based learning that has been tried to be applied to students in the classroom, has a strong influence on student learning outcomes in class, especially in the Knowledge of Materials, Tools and Cooking Methods Course.

Based on the results of the descriptive analysis that has been carried out, the ability of students to engage in group work processes in the subject of knowledge of ingredients, tools, and cooking methods, has the highest score of 15 indicators of student learning achievement. This can happen because in these lectures' students are actively involved to work together in solving a case given in this lecture. For example, students are required to play a role or actively participate in asking and responding to questions so that students are able to develop the ability to think, discuss, and work together in this course. Of course, not all students have the same achievements. It can be seen in the following table.

Table 5. Percentage of Student Learning Outcomes

The most outstanding learning outcome (from 15 indicator)	% (from 100%)	Criteria Learning Outcome	% Learning Outcome
able to be involved in the process of group work on knowledge of ingredients, tools and cooking methods	7.20	Able	57
		Able Enough	41
		Disable	2

To assess the level of success of the Project Based Learning (PjBL) method on student learning achievement, there are 22 indicators that need to be seen, which are given to

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students. Of the 22 indicators, the most prominent thing is the assessment of the original thinking skills that exist in each student during the PjBL project, where the project is given about educational games in the subject of knowledge of ingredients, tools and cooking methods.

The aspect of original thinking ability occurs because in the development of educational games students are required to think critically to uncover problems, formulate solutions, and determine actions in knowing ingredients, tools, and cooking methods. This is in accordance with the statement of Miri et al. (2007) which says that if teachers intentionally and continuously train students' higher-order thinking skills, for example by using real-world problems, encouraging class discussion, and conducting investigations, they will be able to develop students' critical thinking skills. To find out the PjBL criteria, it can be seen in the following table.

Table 6. Recapitulation of Student Questionnaires on Project Based Learning

The most outstanding project-based learning indicator (from 22 indicator)	% (from 100%)	Criteria PBL	% Project Based Learning
think original while participating in project-based learning the development of educational games in the subject of knowledge of ingredients, cooking tools and methods	5.33	Able Able Enough Disable	14 54 32

4. CONCLUSION

Project Based Learning is a learning method that uses projects/activities as media. Learners conduct exploration, assessment, interpretation, synthesis, and information to produce various forms of learning outcomes. Project-based learning or project-based learning is a student-centered learning model to conduct an in-depth investigation of a topic. Students constructively carry out deepening learning with a research-based approach to serious, real, and relevant problems and questions.

The development of a learning model approach during the Covid-19 pandemic with distance learning is needed as an effort to ensure that the teaching and learning process can still be carried out even though the interaction between teachers and students cannot be done directly. The use of digital media such as WhatsApp applications, google classroom, zoom meeting, YouTube and google chrome in classroom management is very necessary to realize the student teaching and learning process. The low lecturer-student interaction in online learning is manifested by classroom management which requires students to consult with lecturers to help solve existing problems. Of course, this causes the teaching and learning process to not depend on the scheduled hours of class schedule, because students may contact the lecturer outside of lecture hours. Weekly learning progress in the form of a logbook is important for lecturers in controlling student learning progress, especially the Project Based Learning approach emphasizes the process of students being creative, thinking critically, being able to make decisions and being accountable for their decisions in the final project results.

As a quantitative measure of the project-based learning model carried out, in this study a survey of 37 questions was distributed via Google Form to 4th semester Tourism Education Students, so that we got 69 respondents. This survey shows that the project-based learning approach has a fairly strong relationship with the achievement of lecture learning. The survey results show that the ability to work in groups of students which is quite dominant emerges from the implementation of project-based learning, and students also have the ability to think

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original while participating in this project-based learning. Project Based Learning model if done with good preparation will bring results in accordance with the learning objectives to be achieved. According to the conclusion, project-based learning if carried out with good preparation will bring results in accordance with the learning objectives to be achieved.

The other important of PjBL learning is that the productivity in learning process results with product that can conduct to push research in campus. The innovative product as output in class could be something that can be potential for further development, and it can give more space for research in higher education. This course only that divide in 15 students' group, they give 15 new innovative products that can be develop more in further research.

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6. AUTHORS' NOTE

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