IMPLEMENTATION OF INTERPERSONAL INTELLIGENCE-BASED BASIC STATISTICS LEARNING DEVICE

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Abstract
This study was aiming to develop a Student Worksheet (LKM) as a learning device based on interpersonal intelligence. The research method used was Thiagarajan's 4-D Development Model, which was at the development stage. This stage was a practical and effective testing phase of interpersonal intelligence-based learning device that had an impact on students' social competence. The practicality of the learning device was measured by the learning management sheet (learning management observation sheet). The conclusions of this study are: (1) the learning device that was developed meets the practicality criteria based on the results of learning management by fulfilling each aspect of the average learning management activities in the good and very good category with a range of values of $2,5 \leq \bar{X} < 3,5$ and $3,5 \leq X < 4,0$; (2) the developed learning device meets the effective criteria shown where 3 of 4 effectiveness indicators specified were met. Indicators that were met were the scores of learning achievement test, student activities, and student responses.

Keywords: Learning Device, Semester Learning Plan, LKM (Students' Worksheet), Basic
Statistics, Interpersonal Intelligence

1. Introduction

The problem of the future is a matter of education. Therefore, every nation has placed education as the main agenda of human resource (HR)development. Schools and campuses have to be as best as a place for human resource management, for the realization of good quality of education for the nation. It's proven this year, the government chose the minister of culture and education NadiemMakariem, who is a young and an inspiring figure, for him is seen to be able to improve the quality of Indonesian human resources through education.

Mathematics as a component of subjects at school, of course, is also a serious concern. But the problem is, often, mathematics is still a scourge for many students because mathematics is still considered difficult and very abstract, and it even goes as far as some students' disliking it. Therefore, there should be an effort to increase the interest in learning mathematics by providing competent and communicative teachers and prospective teachers so that the material learned at schoolcan be delivered well to their students. This for sure align with Indonesian Law Number 14 of 2005 on Teacher and Lecturer that a teacher must posses four competencies, including pedagogical competence, personal competence, social competence, and professional competence [1]. Thus, a prospective teacher is not only required to have intellectual abilities, but also required to havethe ability to explain the materials, understand students, and engage in social activities with people around him;that is usually referred as interpersonal intelligence or social competence.

Interpersonal intelligence is a part of multiple intelligences that consist of 8 components according to Gardner. While Walter McKenzie in Yaumi added existential-spiritual intelligence in the multiple intelligences raised by Gardern before, that made it to be consisting of 9 components of intelligence, including: 1) verbal-linguistic intelligence, 2) logical-mathematical intelligence, 3) visual-spatial intelligence, 4) rhythmic-music intelligence, 5) physical-kinesthetic intelligence, 6) interpersonal intelligence, 7) intrapersonal intelligence, 8) naturalistic intelligence, and 9) existential-spiritual intelligence. According to Yaumi, interpersonal intelligence is the ability to perceive and distinguish the moods, intentions, motivations and desires of others so that they are able to respond appropriately to others [2]. With interpersonal intelligence-based learning system, students as prospective teacher are expected to be able to understand their students well, read their students' mind, understand what they want, and able to read the moods of their students so that they are able to communicate well. These abilities are essential for teachers to implement appropriate strategies in dealing with problems encountered in the classroom with student characters diversity, and also students also feel more comfortable with teachers who are able to understand students well.

Higher education such as University is the right place to forge students' skills as prospective teachers, especially those who choose education majors, namely mathematics education. Because, the subjects taught are not only mathematical concepts but also how to teach and assess correctly. In addition, a lecturer must also familiarize students with active discussion in classroom through a learning model that activates studentsor through student centered system so that students' interpersonal intelligence increases. The learning model that is able to improve students' interpersonal intelligence is a cooperative learning model. This was also said by Behjat F. that Interpersonal intelligence plays a vital role in today's education, particularly in mathematics. Many related studies have indicated that interpersonal intelligence could influence on the success of language learning [3]. So, this study aims to

improve social abilities through interpersonal intelligence-based learning device. The interpersonal intelligence-based learning device used is the Student Worksheet (LKM) that has been validated. This developmental research is to test the practicality and effectiveness of learning tools in basic statistics courses.

2. Review of Literature

According to Kelly, interpersonal intelligence is the intelligence related to how someone responds to others so they can interact with each other [4]. Goleman in Najamuddin states that elements of interpersonal intelligence can be organized in to two broad categories, including social awareness and social facilities. Social awareness is what is felt about other people, while social facilities are what are then done with that awareness. Social awareness refers to a spectrum that spans from feeling the inner state of others instantly tounderstanding their feelings and thoughts, to "get" complicated social situations. Armstrong argues that interpersonal intelligence is intelligence that is demonstrated by the child's ability to properly socialize with others, such as being easy to get along with, understanding other people, and cooperating with others [5]. In addition, Chatif& Said explains that students with interpersonal intelligence understand the teaching and learning process by interacting with others effectively [6]. Nadinigwe also added that with the development of interpersonal intelligence as a true as possible to shape the students' character and positive instill values in him such as working together, independent and lateral thinking, a great sense of empathy and having a positive concept on others [7].

According to Pribady, people who are gifted with interpersonal intelligence generally have the following characteristics [8]:
a.   Happy to interact with others.
b.   Always maintain relationships with others.
c.   Get to know various ways to connect with others.
d.   Often affect the views or opinions of others.
e.   Always participate in collaborative activities.
f.   Able to communicate both verbally and non-verbally.
g.   Often express interest in careers and interpersonal works such as teachers, social workers, management and politics.

Based on the definitions explained above, it is concluded that interpersonal intelligence is someone's ability to communicate or to form relation with others. Someone who has a high interpersonal intelligence also has a high sensitivity to feel what others feel so he can please others with his ability to communicate.

3. Research Method

This research is a 4D-Thiagarajan model development research. The research stage is the development stage. At this stage it is a trial phase to test the practicality and effectiveness of the interpersonal intelligence-based learning device, the Student Worksheet (LKM) which has been declared valid.

2.1 Practicality Test of Learning Device

Practicality of Student Worksheets (LKM) based on interpersonal intelligence, applied by lecturers in the learning process which is a derivative of the RPS that has been made. Observations were made using observation sheets. Observation of the practicality of the learning device aims to ensure that the application of aspects in the Student Worksheet (LKM) is in accordance with the prescribed activity steps. The observational data is recapitulated by calculating the average of each aspect of the observation and the average of all aspects of the observation as a whole. After obtaining the average value of the learning management observation sheet, the learning process management criteria are then determined based on the following table 1:

Table 1. Criteria of Learning Process Management

Value	Criteria
$3,5 \leq X \leq 4$	Very good
$2,5 \leq X < 3,5$	Good
$1,5 \leq X < 2,5$	Not good
$X < 1,5$	Deficient

These criteria are used to conclude that the learning device has an adequate level of adequacy if the average value of each aspect and the average value of all the minimum aspects is at the "Good" category. Furthermore, the reliability of the learning management observation sheet is calculated by the formula of approval percentage from Grinner in Nurdin with the condition that the learning management observation sheet is called reliable if $R \geq 0.75$ [9]. The formula is as follows:

$$Percentage\ agreement = \frac{agreements}{disagreement + agreements} \times 100\%$$

2.2 Effectiveness Testof Learning Device

Analysis of the effectiveness of learning device is supported by the results of data analysis of four components of effectiveness, including (1) students' learning achievement, (2) students' activity, (3) students' response, and (4) development of students' social competency.

After students have been taught all the basic statistics materials based on the RPS then a test is performed and the scores are used to analyze student learning achievement. The data obtained by student learning achievement must still be based on individual completeness criteria and minimum completeness criteria that have been set. If a student gets an $S \geq 6.5$ it means that he has fulfilled the individual completeness criteria. If at least 70% of students reach a minimum score of 65, then the minimum completeness criteria has been reached.

Analysis of the data of students' activity observation during learning for each meeting is done by calculating the average frequency and the average percentage of time spent by students during learning activities. Analysis of student response data on learning device is done by calculating the percentage of students who respond positively according to the aspects in question. The criteria are set to state that students have a positive response to the Interpersonal intelligence-based Student Worksheet (LKM) on basic statistics courses, if 50% of them respond positively at least 70% of the number of aspects asked. If the results of the analysis indicate that student responses have not been positive, then a revision of the device is being

developed. It is also needed to give direction to the teacher / prospective teacher to carry out instructions in accordance with the Student Worksheet (LKM). Analysis of the development of Interpersonal intelligence Student Worksheet (LKM) is done by interviewing each student and through observation sheet. So, the observation sheet was reinforced by interviews with students' responses about the learning process applying interpersonal-based learning in the basic statistics course, in this case the Student Worksheet (LKM).

4. Result and Discussion

A trial of interpersonal intelligence-based Student Worksheet (LKM) was conducted for 8 meetings including 1 meeting forexamination. The subjects of this study were students of the mathematics education program of the University of West Sulawesi in 2018 with a total of 30 students. The results of the study illustrate the practicality and effectiveness of the learning device described as follows:

3.1 Practicality Analysis
Practicality of Student Worksheets (LKM) was based on learning management observation instruments, which was learning management observation sheets. Observation wasdone by two observers to observe the ability of teachers / lecturers to manage mathematics learning using Interpersonal intelligence-based Student Worksheets (LKM). The observations of learning management are shown in table 2below:

Table 2.Result of learning management observation

Aspect	Result of observation						
	M1	M2	M3	M4	M5	M6	M7
Preliminary activities	3	3.1	3.4	3.8	4	4	4
Core activities	2	2.2	2.5	2.5	3.1	3.5	3.5
Cover activities	3.3	3.5	3.4	3.6	3.4	4	4
Average	2.8	2.9	3.1	3.3	3.5	3.8	3.8
Percentage of agreement	77	82	85	85	88	90	92

Table 2. shows that the percentage of approvals of each meeting is more than 75%. So based on predetermined criteria, the learning management observation sheet is declared reliable. Therefore, the data obtained can be used to evaluate the observations of the ability to manage learning activities. Next, table 2also provides information that the average assessment results of all aspects at the meeting 1 to meeting 5 were in the good category ($2.5 \leq <3.5$), while the average findings of all aspects at the meeting 6 to meeting 7 were in the very good category ($3.5 \leq X \leq 4$). If the results of the analysis are in both good and very good categories, it indicates that the application of the learning device meets reliable requirement. And it can be concluded that interpersonal intelligence-based Student Worksheet (LKM) passes the practicality test or in another words, meets practicality requirement.

3.2 Effectiveness Analysis

Effectiveness of the learning device was based on the results of data analysis of four components of effectiveness, which are:

3.2.1 Students' Learning Achievement

After 7 meetings, a test was held in the 8th meeting to test students' learning achievement. Data of learning achievement test is presented in the form of a frequency distribution table as follows:

Table 3. Learning Achievement Score

Interval	Category	Frequency	Percentage (%)
0 - 34	Very lo	0	0
35 - 54	Low	3	10
55 - 64	Medium	6	20
65 - 84	High	18	60
85 - 100	Very high	3	10
Total		30	100

Table 3 provides information that out of the 30 students who took the test, there were no students in the very low category, while students in the low and medium categories are respectively 10% and 20%. And students in the high and very high categories are 60% and 10% respectively.

If the score of students learning achievement is analyzed, then the percentage of completeness of student learning achievement after applying Interpersonal intelligence-based learning device can be seen in table 4 as the following:

Table4.Percentage of minimum completeness criteria

Score	Category	Frequency	Percentage (%)
0 – 64	Fail	10	30
65– 100	Pass	20	70

Based on the table 4, it is known that from 30 students there are 70% who have passed minimum completeness criteria so that it can be stated that learning activities successfully meet the minimum completeness criteria.

3.2.2 Students' Activity

Based on the results of data analysis on the student activity sheet, there are 6 types of activities fulfilled out of 8 types of activities, including activity-1, activity-3, activity-4, activity-5, and activity-7; while activity-2 and activity-6 were not fulfilled. Although there are 2 activities that were not fulfilled, it can still be concluded that the activities of students meet the ideal time achievement criteria because 6 out of 8 activities are fulfilled.

3.2.3 Students' Response

Student response to the implementation of interpersonal intelligence-based Student Worksheets (LKM) integrated with social competence consisted of two assessments, including (1) student responses to the learning activity, and (2) student responses to the textbook.

Based on the analysis of student response to the implementation of interpersonal intelligence-based Student Worksheets (LKM), it is known that there were 90% of students who responded positively to the learning activity. According to predetermined criteria, it can be concluded that students respond positively to the implementation ofinterpersonal intelligence-based Student Worksheet (LKM) because of its structured appearance and attractive colors.

3.2.4 Observation of Interpersonal Intelligence

The results of data analysis based on researchers' observations during the learning process and the results of interviews at the end of the meeting shows thatthere was some changes in each student. The implementation of Interpersonal intelligence-based Student Worksheets (LKM) cannot be said to have been entirely successful, but there is a feeling of happiness if there were some changes. At least 46% of students were declared to have developed and are more confident to be active in the class. Students who were previously quiet began to have confidence to ask their peers. With the peer tutors and Jigsaw learning models, students gained the trust of lecturers to teach their peer group. Students trusted as tutors for their peer, psychologically will have a positive impact on their responsibilities and will make them putmore efforts to learn the material so that they ccould provide an understanding for their peer group. The most expected change in developing students' interpersonal intelligence is to make students be able to speak one by one in front of the class to explain the material and in discussion forums, and also the increase of the number of students who are trusted as peer tutors. During the seven meetings there were at least 14 students who began to be active in front of their classmates. The rest students were still active around their respective groups or can be said that they started to develop. The reasons for why some of the criteria of interpersonal intelligencewere not met are: 1) limited time, 2) the level of confidence to perform in front of the class was still lacking so more motivation is needed.

5. Conclusion

The conclusions in the research development interpersonal intelligence-based Student Worksheets (LKM) are: (1) learning device developed meets practical criteria based on the results of learning management by fulfilling every aspect of average learning management activities with good and very good categories and a range of values of $2,5 \leq \bar{X} < 3,5$and $3,5 \leq X < 4,0$; (2) the developed learning device meets the effective criteria shown where 3 of 4 effectiveness indicators specified were met. Indicators that were met were the scores of learning achievement test, student activities, and student responses.

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