Editorial from Rully Charitas Indra Prahmana, Southeast Asia Editor of MTRJ

Mathematics is a scientific field that can be taught with various approaches, methods, models, and strategies. Mathematics can also be taught by integrating the latest Information and Communications Technology (ICT). Although mathematics is taught using ICT integration (both in learning activities and assessment), the meaningfulness of mathematics can still be obtained by students through the provision of various contextual problems that are close to students' daily lives. In addition to the application of ICT, strengthening student activities in mathematics learning is also the most important part of optimizing the effectiveness of mathematics learning. Student activities in mathematics learning can also be optimized using the Ethnomathematics approach, which uses cultural contexts in mathematics. Therefore, in Vol. 14 No. 4, Fall 2022, MTRJ publishes 12 articles that present different research results on learning mathematics using various approaches, methods, models, and strategies by optimizing student learning activities. In this issue, we also publish one article published in **Problem Corner** section created by the Problem Corner Editor, namely **Ivan Retamoso**.

This issue opens with a paper written by Indonesian researchers Abdul Taram and Fariz Setyawan from Ahmad Dahlan University, Yogyakarta, **Indonesia**, with the title **Stress Tolerance in Probabilistic Thinking: A Case Study.** This research explores students works which scored highest on the stress tolerance dimension could solve problems with simple steps. These findings show that the level of probabilistic thinking depends on students' stress tolerance.

The second paper continues with a study that applied play in learning numerical sense for primary school students. Selepe Mmakgabo Angelinah and Mphahlele Ramashego Shila from the University of Free State and the University of South Africa, **South Africa**, present an article entitled **The Viability of Play in Teaching Number Sense to Grade 3 Learners**. This research offers the use of play in teaching number sense to Grade 3 learners through simple yet quality materials. The research also recommends using indigenous games that are easy to find as a medium for learning numbers.

In this issue, MTRJ publishes two papers that were analyzed using Rasch Measurement analysis. In the first paper, Rahmi Ramadhani, Nuraini Sri Bina, and Edi Syahputra from Universitas Negeri Medan and Universitas Potensi Utama, Medan, **Indonesia** writes the first Rasch analysis paper with the title **Flipped Classroom Assisted Autograph in Calculus Learning for Engineering Students: A Rasch Measurement Study**. This research analyzes calculus learning for engineering students using an Autograph-based Flipped Classroom. Integrating Autograph as ICT media helps engineering students understand Calculus material. The Rasch Measurement-Stacking Analysis results show a change in the logit value of each student's test results. This result shows that the mathematics learning

achievement of engineering students increased, and students gave positive feedback after being taught using the Flipped Classroom model assisted by Autograph.

Furthermore, in the second Rasch analysis paper, Suherman and Tibor Vidákovich from the University of Szeged, **Hungary** presents a paper that used Rasch Measurement analysis in analyzing students' creative thinking ability through learning tapis pattern mathematics in the context of Ethnomathematics. The paper entitled **Tapis Patterns in the Context of Ethnomathematics to Assess Students' Creative Thinking in Mathematics: A Rasch Measurement** discuss the Tapis Lampung design used includes geometry concepts that can be used in measuring students' creative thinking skills. Each Tapis pattern also includes local values (i.e., sacred value, social stratification, history and understanding, creativity, inclusivity, and economic value).

The use of technology in mathematics learning is also used in the next article by Ana Katalenić and Zdenka Kolar-Begović from the University of Osijek, **Croatia**, with the title **Prospective Primary School Teachers' Work in Continuous Online Assessments in the Course of Didactics of Mathematics.** This research applies online assessment to the effectiveness of blended learning conducted by prospective primary school teachers. This research is an evaluation conducted during emergency distance learning due to the Covid-19 Pandemic. The findings show that students' learning approaches were strategic and relied heavily on peer support. The results of this research may influence the design of future continuous assessments in blended learning for prospective primary school teachers.

Investigation of students' activities is the focus of further research offered in the next article by Muhammad Daut Siagian, Didi Suryadi, Elah Nurlaelah, Sufyani Prabawanto from Universitas Pendidikan Indonesia and Universitas Islam Sumatera Utara, **Indonesia**, entitled **Investigation of Secondary Students' Epistemological Obstacles in the Inequality Concept.** This research explores the epistemological obstacles students face in the inequality concept by analyzing the errors in solving inequality problems. The results show that there are obstacles experienced by students, which are shown by students' limitations in understanding and interpreting inequality signs in solving inequality problems.

The next paper was written by Hashituky Telesphore Habiyaremye, Celestin Ntivuguruzwa, and Philothere Ntawiha from the University of Rwanda College of Education (URCE), **Rwanda**, with the title **Assessment of Teaching Methods in Mathematical Simplicity and Complexity in Rwandan Schools via Pedagogical Content Knowledge**. This research focuses on assessing the practice of Rwandan mathematics teachers through strengthening pedagogical content. The results find a lack of mastery of content and specialized knowledge at the university level was the cause of low teacher performance. The research recommends providing training in content knowledge to strengthen the teaching practices of teachers, especially those from teacher training colleges.

The next two papers focus on the competencies of prospective and mathematics teachers. The paper entitled **The Investigation of Concept Image towards Derivative Representation: A Case Study of Prospective Mathematics Teacher** was written by Aditya Prihandhika, Didi Suryadi, Sufyani Prabawanto from Universitas Pendidikan Bandung and Universitas Islam Al-Ihya Kuningan, **Indonesia**. This research presents a qualitative research design that investigates the conceptual description of prospective teachers in derivative representation. The results show the conceptual description of all participants on the concept of derivatives was still limited to the representation of functions.

Furthermore, María Burgos Navarro and María José Castillo Céspedes from the University of Granada, Spain, and the University of Costa Rica, **Costa Rica**, present their research entitled **Developing reflective competence in pre-service teachers by analyzing textbook lessons: the case of proportionality**. This study describes the implementation and outcomes of training actions with 45 pre-service teachers to develop reflective competence by analyzing the didactical appropriateness of a lesson on direct proportionality. The implementation results show the evolution of reflective competence in most pre-service teachers, who could make detailed judgments by correctly applying the appropriateness criteria, especially in the cognitive-affective and instructional dimensions.

The last three papers focus on the development of teaching materials and exploring alternative solution for some calculus problem. The first paper entitled **The Development of Inquiry-Based Teaching Materials for Basic Algebra Courses: Integration with Guided Note-Taking Learning Models** written by Merina Pratiwi, Dewi Yuliana Fitri, and Anna Cesaria from the University of PGRI West Sumatra, **Indonesia**. This research produces inquiry-based learning tools with guided notes for Basic Algebra courses that are valid, effective, and practical. Furthermore, Tria Gustiningsi and colleagues from Sriwijaya University, **Indonesia**, produce a jumping task in the form of a valid and practical student worksheet through research entitled **Designing Student Worksheet on Relation and Function Material for Mathematics Learning: Jumping Task.** The results show that the designed student worksheet could help students understand the instructions or questions in the student worksheet and could be used by students. Lastly, the paper entitled **Heuristic Method for Minimizing Distance without using Calculus and Its Significance** written by Ivan Retamoso from Borough of Manhattan Community College of the City University of New York, USA. In this paper, he provides alternatives for solving some Applied Optimization Problems related to minimizing a distance, without the use of the Derivative from Calculus, and instead, using a "Reflection Principle" based on symmetry, Geometric properties, and heuristic methods.

Rully Charitas Indra Prahmana
Southeast Asia Editor of MTRJ

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Designing Student Worksheet on Relation and Function Material for Mathematics Learning: Jumping Task

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Abstract: This study aims to produce a jumping task in the form of a student worksheet which is valid and practical. Design research in the form of development studies was chosen in this study which consist of preliminary stage and prototyping stage. Data were collected by walk through, test, questionnaire, and interview. Data were analyzed descriptively. Student worksheet is declared valid in terms of content, construct, and language. The results of this study show that the student worksheet is valid and practical. The student worksheet is in accordance with the HOTS level in the taxonomy of Bloom and the PISA framework, in accordance with the curriculum and the material for eight grades, and in accordance with the General Guidelines for Indonesian Spelling (PUEBI) and did not cause multiple interpretations. Then, the students understand the instructions or questions in the student worksheet, and it can be used by students.

INTRODUCTION

Creativity, critical thinking, communication, and collaboration (4C) or often referred to as higher order thinking skills (HOTS) are needed by student in the 21st century (Kemdikbud, 2017; Putri, 2018; Hwang, et al., 2017). Educators, researchers, and various parties state that HOTS is very important for everyone (Bakry & Bakar, 2015; Abosalem 2016; Tambunan & Naibaho, 2019; Elfeky 2019; Lu, 2021; Gustiningsi & Somakim, 2021; Utari & Gustiningsi, 2021; Gustiningsi & Utari, 2021).

There is a relationship between HOTS in Bloom's Taxonomy and PISA framework. In Bloom's taxonomy, HOTS is at a high level, which consist of analyzing, evaluating, and creating (C4, C5, and C6) (Efendi, 2017). In the Program for International Student Assessment (PISA), there are questions at level 4,5,6 which is HOTS level (Setiawan, Dafik, & Lestari, 2014). Based on

indicators, there is a match between the Bloom's taxonomy and the PISA framework. Level 4 in PISA describing that students can make model concrete situations, make assumptions, choose, and integrate different interpretations, relate information they have and give arguments or communicate them (OECD, 2018). In Bloom's Taxonomy, level 4 describing that the ability to break down information into pieces of information and detect the relationship of information to one another and to the overall structure and purpose (Anderson and Krathwohl, 2001; McNeil, 2011; Widana, 2017). This description shows that they have the same ability to analysis or relate information to provide arguments and solve problems. Then, level 5 in PISA describing that students can develop models for complex situations, identify constraints and determine assumptions, select, compare, and evaluate appropriate problem-solving strategies, formulate, and communicate their interpretations and reasons (OECD, 2018). In Bloom's taxonomy, level 5 describing that students make judgments or decisions based on criteria and standards (Anderson and Krathwohl, 2001; McNeil, 2011; Widana, 2017). This description shows that they have the same ability to evaluate and identify criteria or several things and make decisions. Then, level 6 in PISA describing that students can conceptualize, generalize, and utilize information based on investigation and modeling of complex problem situations, apply mathematical insights and understanding to develop new approaches and strategies, reflect and formulate as well as communicate appropriately actions and reflections on their findings (OECD, 2018). In Bloom's Taxonomy, level 6 describing that student putting elements together to form a new shape (Anderson and Krathwohl, 2001; McNeil, 2011; Widana, 2017). This description shows that they have the same ability to create something new based on the information possessed by students.

The PISA results show that Indonesian students' mathematical literacy skills are still low (OECD, 2019). In 2018, in the field of mathematics, Indonesia was ranked 72 out of 78 countries (OECD, 2019). Likewise in Trends in International Mathematics and Science Study (TIMSS), in 2016 Indonesia was ranked 44th out of 49 countries (Utomo, 2021). Previous research analyzed students' HOTS abilities, including students' critical thinking skills (Gustiningsi, 2015), students' ability to solve HOTS problems (Abdullah, et al, 2015), and showed that students' HOTS abilities were still low.

HOTS ability can be improved through learning in class. Bakri and Bakar (2015) stated that students' abilities can be developed through activities and mathematics learning. Teachers must pay attention to students so that they can develop students' HOTS abilities (Purnomo, et al., 2021; Pasani & Suryaningsih, 2021).

One of methods that can be done to develop students' HOTS abilities is designing student worksheets to be used in class. Previous research shows that student worksheet is able to improve students' abilities such as students' concept understanding (Nursyahidah, Putri, & Somakim, 2013), students' problem-solving abilities (Fitriati & Novita, 2018) and students' creative thinking skills (Romli, Abdurrahman, & Riyadi, 2018). The student worksheet must meet the HOTS criteria. Sato stated that to improve the quality of learning, the quality of the tasks given is influential, one of the tasks given was in the form of a challenging task or called a jumping task (Saito, 2015).

Sato stated that the HOTS task was related to the jumping task applied in lesson study (Putri,

2018; Putri & Zulkardi, 2019; Hobri, 2020). Jumping tasks are effective in supporting students' HOTS abilities (Putri, 2018), one of which is problem solving skills (Hobri, et al., 2020).

Previous research has designed jumping tasks using the PISA framework (Zulkardi & Putri, 2020; Putri & Zulkardi, 2019), with an RME approach (Sa'id, et al., 2021), and based on an open-ended question (Ummah, et al., 2021). Meanwhile, this study designed the jumping task in the form of a student worksheet using the PISA framework and adjusted the worksheet to the HOTS level in the Bloom's taxonomy. This study aims to produce a valid and practical jumping task-based student worksheet.

RESEARCH METHOD

Design research in the form of development studies was chosen in this study (Bakker, 2019). The research subjects were 20 eight graders with an average age of 14 years old. The stages carried out are the preliminary stage and the prototyping stage (Tessmer, 1993; Zulkardi, 2002; Akker, et al., 2013) as shown in Figure 1.

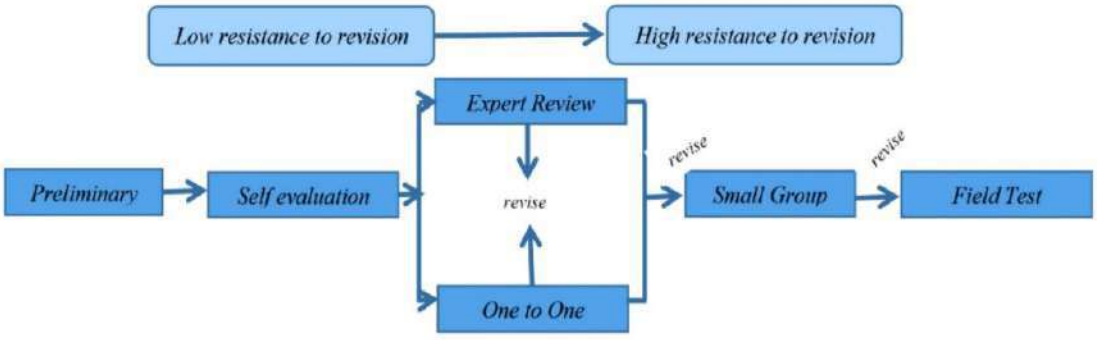

Figure 1: Prototyping Flow (Tessmer, 1993; Zulkardi, 2002; Akker, et al., 2013)

In the preliminary stage, preparations were made to develop a jumping task in the form of a student worksheet, including analyzing eight graders' materials, analyzing research subjects, and analyzing HOTS levels in the taxonomy of Bloom, and analyzing levels in the PISA framework. Furthermore, the prototyping stage starts from the first stage, namely self-evaluation. In the self-evaluation stage, student worksheets were created and self-evaluated (prototype I). The second stage was the stage of expert review and one-to-one. In the expert-review stage, prototype I was validated by experts to see the validity of the student worksheet in terms of content, construct, and language. In the one-to-one stage, prototype I was tested on 2 students who were not research subjects to see the usability of the student worksheet, seen from student answers and student comments in interviews while working on the student worksheet and in the questionnaire after completing on the student worksheet. Then, prototype I was analyzed and revised according to suggestions from experts and according to students' comments and answers. The revised student worksheet is called prototype II. Then, prototype II was tested in the small-group stage

on 5 students who were not research subjects. The small-group stage was also aimed to see the practicality of the student worksheet based on the answers and comments of students during and after completing on the student worksheet. Furthermore, the student worksheet that had been tested was analyzed and revised, hereinafter referred to as prototype III. Furthermore, prototype III was tested at the field-test stage to 20 students who were research subjects.

Data were collected through walk-through, questionnaires, interviews, and tests. The walk-through was used at the expert-review stage to ask for advice and comments from the expert, while tests, questionnaires, and interviews were used at the one-to-one, small group, and field test stages. The test was used to see the usability of the developed student worksheet (prototype) and to see the students' way of thinking, while the questionnaire and interviews were used to find out comments, constraints, and difficulties, and explore students' ways of thinking when completing the student worksheet. The walk-through was analyzed descriptively. Comments and suggestions from experts were described and used as materials for revising prototype I. The tests were analyzed based on the scoring rubric, then described. The scoring rubric available in Table 1.

Question	Possible Student Answer	Score
On Monday afternoon at 16.00 West Indonesian Time, Ani wanted to call her friend for about 5 minutes because she had very important business at the time. Ani is confused whether to just call or register for a talkmania package. Finally, Ani choose to sign up for the talkmania package. Is Ani's decision right? Please describe your reason.	Students can relate the information in the table and compare the price of calling with talkmania packages and non-package prices. Then, the students make decisions about which package should be chosen.	1
	Student can't relate the information in the table and compare the price of calling with talkmania packages and non-packages prices.	0
If on Monday afternoon at 16.00 West Indonesian Time, Ani chooses to make a call with a non-package call rate, draw a graph that shows the time between Ani's call and the price she has to pay every minute.	Students can draw a graph that shows the relationship between calling time and costs incurred.	1
	Students can't draw a graph that shows the relationship between calling time and costs incurred.	0
Is the relationship between time and the price of this non-packaged call called a function? Describe your reasons.	Students analyzed answers by paying attention to the definition of a function and relating it to the condition of the relationship between non-packet calling	1

Question	Possible Student Answer	Score
	time and the cost.	
	Students can't analyze answers by paying attention to the definition of a function and relating it to the condition of the relationship between non-packet calling time and the cost.	0

Table 1: The scoring rubric for test

Interviews and questionnaires were analyzed descriptively, then used as supporting information in the development process. The student worksheet is said to be valid in terms of content and construct seen at the expert review stage. The student worksheet is said to be valid in terms of content if it is in accordance with the HOTS level in the Bloom's taxonomy and PISA framework and is valid in terms of constructs if it is in accordance with the curriculum. Student worksheet is said to be practical if it can be understood by students, can be completed, does not cause multiple interpretations, and students are interested in doing it.

RESULTS

The student worksheet had been developed in two stages, namely preliminary and prototyping. The preliminary stage was carried out by analyzing the curriculum, determining the material, analyzing HOTS criteria in Bloom's taxonomy, and analyzing HOTS criteria in PISA framework. A description of the HOTS levels in Bloom's taxonomy and the PISA framework is provided in Table 2.

Level	Bloom's Taxonomy	PISA Framework
Level 4	Analysis: The ability to break down information into pieces of information and detect the relationship of information to one another and to the overall structure and purpose. (Anderson and Krathwohl, 2001; McNeil, 2011; Widana, 2017)	Students can model concrete situations, make assumptions, choose, and integrate different interpretations, relate information they have and give arguments or communicate them (OECD, 2018).
Level 5	Evaluation: Make judgments or decisions based on criteria and standards (Anderson and Krathwohl, 2001; McNeil, 2011; Widana, 2017)	Students can develop models for complex situations, identify constraints and determine assumptions, select, compare, and evaluate appropriate problem-

Level	Bloom's Taxonomy	PISA Framework
		solving strategies, formulate and communicate their interpretations and reasons (OECD, 2018).
Level 6	Create: Putting elements together to form a new shape (Anderson and Krathwohl, 2001; McNeil, 2011; Widana, 2017)	Students can conceptualize, generalize, and utilize information based on investigation and modeling of complex problem situations, apply mathematical insights and understanding to develop new approaches and strategies, reflect and formulate as well as communicate appropriately actions and reflections on their findings (OECD, 2018).

Table 2: Cognitive level of HOTS category in taxonomy bloom and PISA framework

As Table 2 indicates, there is a match between levels 4,5,6 in the Bloom's taxonomy and the PISA framework. Thus, it can be formulated that the HOTS level consists of the ability to analyze, evaluate, and create. Next, the prototyping stage was carried out in the self-evaluation stage. In the self-evaluation stage, student worksheets were compiled and prototype I was produced. Prototype I is presented in Figure 2.

Available calling rates as shown in Figure 1 and Figure 2.

Talkmania (TM) information	TM Day	TM night	TM Double
TM Rate	Rp 2.500	Rp 2.500	Rp 12.500
TM package you get	call package 200 minutes (Monday – Friday) call package 250 minutes (Saturday – Sunday)	call package 150 minutes	Call package 150 minutes per day for 6 days
Registration time	01.00 – 16.30 West indonesian time	17.00 – 23.30 West indonesian time	01.00 – 12.00 West indonesian time
Usage Time	01.00 – 18.00 local time	17.00 – 24.00 local time	01.00 – 17.00 local time

Figure 1. Talkmania Package Call Rates

Telephone

00.00– 16.59
Rp 109/5 seconds, next Rp 32/5 seconds for 60 seconds. Repeating scheme. Rate for Sunday: Rp 192/10 seconds for 300 seconds, next Rp 0/minute for 600 seconds. Repeating scheme.

17.00 – 23.59
Rp 99/5 seconds for 60 seconds, next Rp 30/5 seconds for 60 seconds. Repeating scheme. Rate for Sunday: Rp 174/10 seconds for 300 seconds, next Rp 0/minute for 600 seconds. Repeating scheme.

Figure 2. Non-package call rates

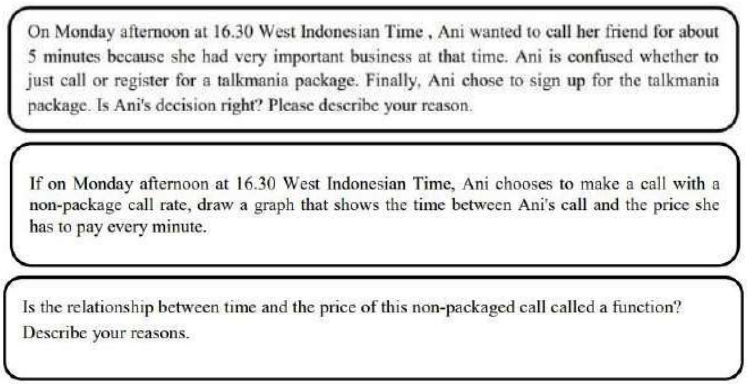

Figure 2: Prototype I

For the ability to analyze, the student worksheet provides a table of tariff for calling and non-package, which shows the price, registration time and usage time. This table presents information that must be analyzed by students to be able to answer the questions in the student worksheet. Then, for the ability to evaluate, the question "whether Ani's choice is right", is a stimulating question so that the students can judge or choose on the answer based on the information that has been analyzed previously. For creative skills, the question to draw a graph and the question “is the relationship between time and price a function” stimulates students to make a graph and create an argument in the form of a picture or another to answer the question. The relationship between the student worksheet and the HOTS level can be seen in Table 3.

Student Worksheet	Level Cognitive

Available calling rates as shown in Figure 1 and Figure 2.

Talkmania (TM) information	TM Day	TM night	TM Double
TM Rate	Rp 2.500	Rp 2.500	Rp 12.500
TM package you get	call package 200 minutes (Monday – Friday) call package 250 minutes (Saturday – Sunday)	call package 150 minutes	Call package 150 minutes per day for 6 days
Registration time	01.00 – 16.30 West indonesian time	17.00 – 23.30 West indonesian time	01.00 – 12.00 West indonesian time
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Rp 99/5 seconds for 60 seconds, next Rp 30/5 seconds for 60 seconds. Repeating scheme. Rate for Sunday: Rp 174/10 seconds for 300 seconds, next Rp 0/minute for 600 seconds. Repeating scheme.

Figure 2. Non-package call rates

Analysis

On Monday afternoon at 16.30 West Indonesian Time , Ani wanted to call her friend for about 5 minutes because she had very important business at that time. Ani is confused whether to just call or register for a talkmania package. Finally, Ani chose to sign up for the talkmania package. Is Ani's decision right? Please describe your reason.

Analysis dan Evaluation

If on Monday afternoon at 16.30 West Indonesian Time, Ani chooses to make a call with a non-package call rate, draw a graph that shows the time between Ani's call and the price she has to pay every minute.

Analysis, Evaluation, and Create

Is the relationship between time and the price of this non-packaged call called a function? Describe your reasons.

Analysis dan Evaluation

Table 3: Student worksheet relationship with HOTS level

Then, prototype I was validated by the expert at the expert review stage. The expert provided suggestions and comments consisting of 1) Please add pictures that can attract students' attention, 2) Non-package data is simplified to 60 seconds, 3) The call package tariff table should be retyped so that it is clear, 4) It is in accordance with the HOTS level based of taxonomy bloom and PISA framework, 5) It is in accordance with curriculum and material for eight graders.

In parallel, prototype I was tested on 2 students at the one-to-one stage. Based on the students' answers in the one-to-one stage, the students were confused about the non-package price, and they were confused about changing the price per second on the non-package tariff.

Based on the expert- review and one-to-one stage, prototype I was analyzed and revised with the revision decision. The revised decision consists of: 1) Add pictures that can attract students' attention, 2) Non-package data simplified to 60 seconds, 3) Rate table retyped. The revised student worksheet is called prototype II, as shown in Figure 3.

ACTIVITY INSTRUCTIONS:
1. Discuss with your group to answer the questions provided.
2. Write your answers in the space provided.

Call rates are available as shown in Table 1 and Table 2.

Table 1. Talkmania Package Call Rates

Talkmania (TM) information	TM Day	TM night	TM Double
TM Rate	Rp 2.500	Rp 2.500	Rp 12.500
TM package you get	call package 200 minutes (Monday – Friday) call package 250 minutes (Saturday – Sunday)	call package 150 minutes	Call package 150 minutes per day for 6 days
Registration time	01.00 – 16.30 West indonesian time	17.00 – 23.30 West indonesian time	01.00 – 12.00 West indonesian time
Usage Time	01.00 – 18.00 local time	17.00 – 24.00 local time	01.00 – 17.00 local time

Source: https://ngelag.com/cara-tm-simpati-nelpon-siang-malang-murah/

Non-package call rates are also available.

Table 2. Non-Package Call Rates

Time	Rate
00.00 - 16.59	Rp 1.300 every 60 seconds (Monday - saturday) Rp 1.100 every 60 seconds (sunday)
17.00 - 23.59	Rp 1.188 every 60 seconds (Monday - saturday) Rp 1.100 every 60 seconds (sunday)

On Monday afternoon at 16.00 West Indonesian Time , Ani wanted to call her friend for about 5 minutes because she had very important business at that time. Ani is confused whether to just call or register for a talkmania package. Finally, Ani chose to sign up for the talkmania package. Is Ani's decision right? Please describe your reason.

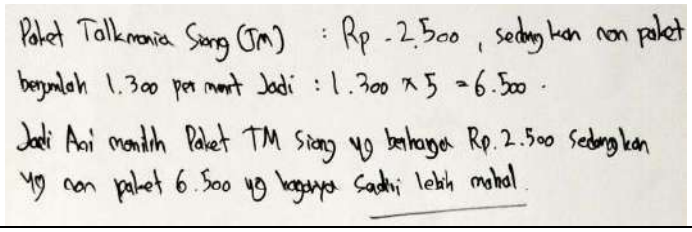
If on Monday afternoon at 16.00 West Indonesian Time, Ani chooses to make a call with a non-package call rate, draw a graph that shows the time between Ani's call and the price she has to pay every minute.

Is the relationship between time and the price of this non-packaged call called a function? Describe your reasons.

Figure 3: Prototype II

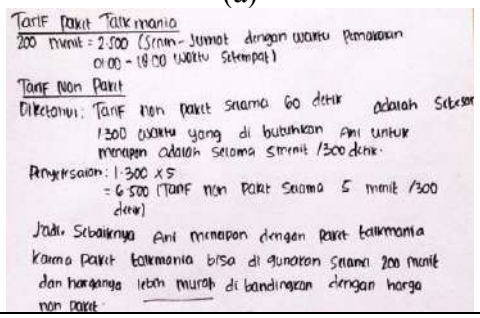
Prototype II was tested on students in the small group stage to four students. In the small group stage, it can be seen from the students' answers that none of the students were confused about the questions on the student worksheet and students stated that they needed a high level of thought to determine the answers on the student worksheet. This is a consideration for the researchers not to revise prototype II because it can practically be done by students and requires high thinking. Then, the student worksheet was tested in the field test stage.

In the field test stage, there were 20 students who were the subjects for the student worksheet test. The students' answers to the first question regarding Ani's decision to choose the talk mania package are as follows.



Translated to English:
Talkmania Day package: IDR 2.500, while the non-package is IDR 1300 per minute, So 1.300 x 5 = 6.500. So, Ani bought the TM Day package for IDR 2500, while the non-package is IDR 6.500 which more expensive.

(a)



Translated to English:
Talkmania package rates
200 minutes = 2.500 (Monday – Friday with usage time are 01.00 – 18.00 local time)

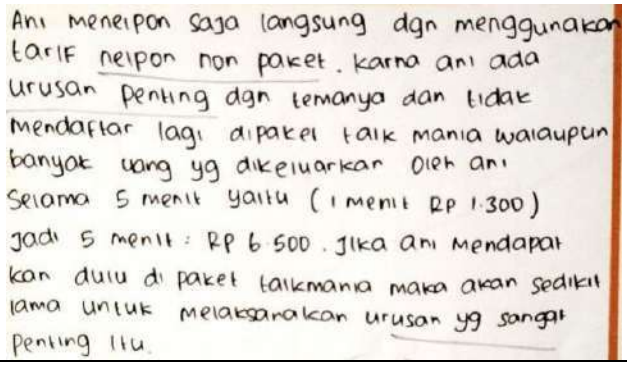
Non-package rates
Known: non-package rates for 60 seconds is 1300, the time which Ani needed to call is 5 minutes or 300 seconds.
Solution:
1.300 x 5 = 6.500 (non-package rates for 5 minutes or 300 seconds). So it's better if Ani call with the talkamnia package because the talkmania package can be used for 200 minutes and the price is cheaper than the non-package price.

(b)

Figure 4: Students' answers to questions about Ani's decision

As Figure 4 shows, the students analyzed package and non-package prices and then compared them. They evaluated it by calculating the non-package price for 5 minutes and it can be seen that the non-package price is more expensive than the price for calling with a talkmania package. Then, the students can decide that Ani's choice is right.

In addition, there were students who answered differently from the answers in Figure 4, as shown in Figure 5.



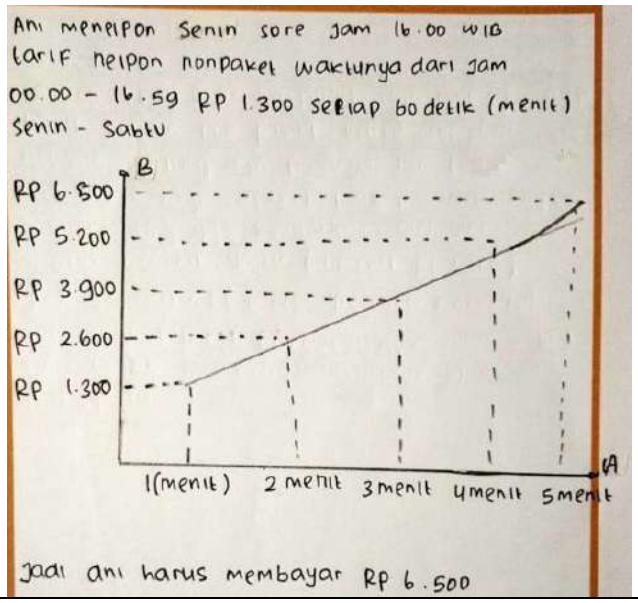
Translated to English:

Ani just called directly using a non-package call rate because Ani had important business with her friend and didn't register for the talkmania package even though Ani spent a lot of money for 5 minutes (1 minute IDR 1.300) so 5 minutes was IDR 6.500. If Ani registers in the talkmania package first, it will take a longer time to carry out that very important business.

Figure 5: Different Students' Answers to the First Question

Based on Figure 5, students answered that Ani should call at a non-package rate because it would save time. In Figure 5, it can be seen the students analyzed the price of package and non-package so that they know the cheaper price for calling is making a call with a talkmania package, it is also seen that the students evaluated Ani's decision by calculating the cost of calling for 5 minutes, but they focused on the sentence "There is an important business right away" which according to the student in Figure 5 that the matter should not be postponed, so students answered the call directly with non-package only with the risk of being more expensive but saving time.

Then, for the second question regarding graphics. Students' answers can be seen in Figure 6.

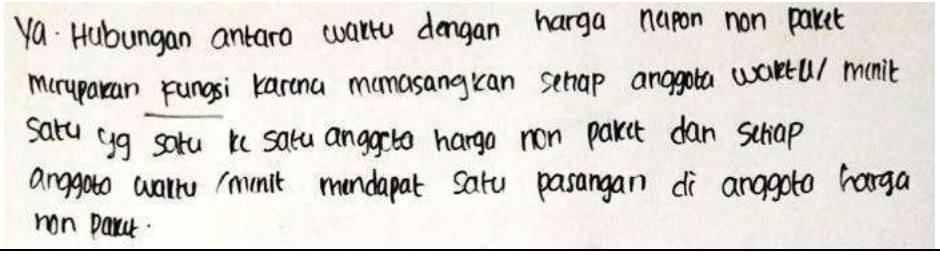


Translated to English:
Ani call at Monday afternoon at 16.00 West Indonesian Time, non-package call rates from 00.00 – 16.59 is IDR 1.300 every 60 seconds.

Figure 6: Student Answers for the Second Question

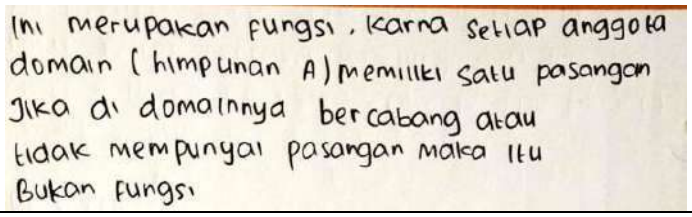
Based on Figure 6, the students can draw and describe the graph that shows the relationship between the costs incurred when calling with non-package rates and with the length of time calling.

Next is the question of whether the relationship between time and the price of non-packaged calls a function is. The students' answers are shown in Figure 7.



Translate in English:
Yes, the relationship between time and non-package prices is a function because each time member pairs one at a time to a non-packaged price member, the time member gets one pair to a non-packaged price member.

(a)



Translate in English:
This is a function because each member of the domain (set A) has one pair. If the domains are forked or have no pairs then it's not a function

(b)

Figure 7: Student Answer for Third Question

Based on Figure 7, the students can determine that the relationship between call time and price is a function. In Figure 7 (b), the students explained the comparison between functions and non-functions. From Figure 7(a) dan 7(b), the students can analyze and evaluate to decide the right answer.

DISCUSSION AND CONCLUSIONS

Akker, et al. (2013) stated that a product is said to be valid if the product developed is based on knowledge or science (content validity) and if the product is consistent with each other or is logical to design (construct validity). Based on the research results, the expert stated that the student worksheet was in accordance with the HOTS level based on the Bloom's taxonomy and the PISA framework. This shows that the student worksheet is valid in terms of content. Then, the expert stated that the student worksheet was in accordance with the 2013 curriculum and that the material chosen was in accordance with the material in class VIII. This shows that the student worksheet is valid in terms of constructs.

Student worksheets are said to be practical if they can be used and are easy to use (Akker, et al., 2013). Based on the development of the prototyping stage from one-to-one to field-tests, students' answers show that they can work on the given student worksheet and are not confused by the questions or information in the student worksheet. This shows that the designed student worksheet is practical.

Students' answers show that the students can relate the information in the table and compare the price of calling with talkmania packages and non-package prices. Then, the students make decisions about which package should be chosen. There are some versions of student answer, there are students who choose the talkmania package as calling with the talkmania package is cheaper than the non-packaged one. However, there is student prefer to call with non-package with the reason that the process is faster, they pay attention to the sentence "there is an important business right away".

The students' answer corresponds to the description of their ability to analyze and evaluate (Anderson and Krathwohl, 2001; McNeil, 2011; Widana, 2017). Judging from the level in the PISA framework, the students' answer show that they can make models from real situations, make assumptions, are able to interpret tables or available information and relate the information provided in tables and questions in the student worksheet to determine answers. This includes capabilities at level 4 in the PISA framework (OECD, 2018). Then, students are also able to determine which calling package decision should be chosen by including their respective arguments. This includes capabilities at level 5 of the PISA framework.

Then, the students can draw a graph that shows the relationship between calling time and costs incurred. To draw a graph, students analyzed the available information about prices and calling times consisting of days and hours. They evaluated the relationship between calling time and the costs incurred for calling with non-package. Then, the students create a new graph. The student's answer about the graph corresponds to the description of the ability to analyze, evaluate, and create (Anderson and Krathwohl, 2001; McNeil, 2011; Widana, 2017). Based on the level in the PISA framework, the students' ability to analyze to draw graphs is included in level 6 because it is seen that the students can create concepts between the x-axis and y-axis, utilize information, and apply insights to develop new strategies (OECD, 2018). It can be seen in students answer that the students present graphs and can read clear information from the displayed graphs.

The next answer show that students analyzed answers by paying attention to the definition of a function and relating it to the condition of the relationship between non-packet calling time and the cost. Then, the students evaluated it by comparing it with the definition of a non-function. The students' answers about the function correspond to the description of the ability to analyze and evaluate (Anderson and Krathwohl, 2001; McNeil, 2011; Widana, 2017). Based on the PISA framework, the students meet ability levels 4 and 5, because it appears that students can model real situations, determine assumptions, interpret the relationship between calling time and cost, relate existing information, and to decide that the relationship between calling time and non-package calling costs is a function with the correct arguments.

Based on students' answers, the designed student worksheet is able to improve students' HOTS abilities. This is in accordance with the jumping task criteria, namely the task given is challenging and requires the HOTS ability to complete it (Saito, 2015; Hobri, 2016).

Based on the student worksheet development, a valid and practical student worksheet has been produced. The student worksheet is declared valid in terms of content because it is in accordance with level HOTS in taxonomy bloom and PISA framework. The student worksheet is valid in terms of constructs because it is in accordance with the material contained in the 2013 curriculum for eight graders. The student worksheet is also practical which shows that it can be used by students, students understand the purpose of activities or problems in the student worksheet, and support student ability namely HOTS.

Suggestion for future learning that this student worksheet can be used for classroom learning to train students' HOTS. For further research, it is possible to develop student worksheets with different materials so that more jumping task-based student worksheet are produced.

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