

2017 INTERNATIONAL CONVERENCE ON EDUCATION AND SCIENCE
(ICONS 2017)

"CHARACTER DEVELOPMENT IN THE 21ST CENTURY EDUCATION"

Publication by:
Pengurus Besar PGRI



In Cooperation with:



UPY



IKIP PGRI WATES



UNINDRA



UPGRIS



**PROSIDING
SEMINAR INTERNASIONAL PENDIDIKAN DAN SAIN TAHUN 2017**

ISBN: 978-602-61512-1-6

REVIEWER

1. Prof. Dr. Supardi, M. Pd, General Secretary Deputy of PGRI Executive Board
2. Prof. Dr. Buchory, Rector of Universitas PGRI Yogyakarta
3. Dr. Muhandi, SH., M. Hum, Rector of Universitas PGRI Semarang
4. Prof. Dr. Sumandar, M. Pd, Lecturer of Universitas PGRI Semarang
5. Dr. Fathiaty Murtadho, M. Pd, Lecturer of Universitas Negeri Jakarta
6. Dr. M. Jumaria, M. Pd, Rector of IKIP PGRI Wates
7. Hj. Antin bin Abad, President of Guru Melayu Brunei Darussalam
8. Prof. Majid Konting, University Kebangsaan Malaysia
9. Prof. Datu' Dr. Hussein bin Haji, University Of Malaya Ahmad
10. Prof. Dr. Hadijah Rahmat, National Institute Of Education-NTU
11. Prof. Dr. Saedah Buang, National Institute Of Education-NTU
12. Dr. Derek Pornsima, Dean of College of Education, Prankorn Rajabhat University, Bangkok

Diterbitkan oleh Pengurus Besar Persatuan Guru Republik Indonesia (PB PGRI)

Jl. Tanah Abang III No. 24 Jakarta 10160 Indonesia

Email : pbpgri@pgri.or.id

Cetakan Pertama, Juli 2017

Hak Cipta dilindungi undang-undang pada Penulis. Dilarang memperbanyak sebagian atau seluruh isi buku ini dalam bentuk apapun, baik secara elektronik maupun mekanik. Termasuk memfotokopi, merekam, atau dengan menggunakan system penyimpanan lainnya, tanpa izin tertulis dari penerbit.

UNDANG – UNDANG NOMOR 19 TAHUN 2002 TENTANG HAK CIPTA

1. Barang siapa dengan sengaja dan tanpa hak mengumumkan atau memperbanyak suatu ciptaan atau memberi izin untuk itu, dipidana dengan pidana penjara paling lama 7 (tujuh) tahun dan / atau denda paling banyak Rp. 5.000.000.000,- (lima milyar rupiah)
2. Barang siapa dengan sengaja menyiarkan, memamerkan, mengedarkan, atau menjual kepada umum suatu ciptaan atau barang hasil pelanggaran Hak Cipta atau Hak Terkait sebagaimana dimaksud pada ayat (1), dipidana dengan pidana penjara paling lama 5 (lima) tahun dan/atau denda paling banyak Rp. 500.000.000,- (lima ratus juta rupiah)

119.	The Profile Of Mathematical Literacy Of Mathematics Teacher Candidates In Terms Of Mathematical Ability <i>Mah.Samad Rumalean, Student of Doctoral Program of Mathematics Education Unesa, Indonesia.</i>	937-944
120.	Efforts to Increase Learning Results of Learning Environment Using Cooperative Learning Method Type Make a Match in Students IV SD N 3 Punggalan <i>Sarosa, Indonesia</i>	945-950
121.	Mathematical Problem Solving Skills in Two Variable System of Linear Equations <i>Tio Akma¹ Masters in Mathematics Education Campus 2 PPs UAD Unit B Jl. Pramuka No. 42 Yogyakarta, Indonesia.</i>	951-955
122.	The Development of Physics Learning Packaging Based on Laboratory to Optimises Student's Multiple Intelligences <i>Nurul Azzina, Prabowo, Munasir, Science Education, Graduate Program, Universitas Negeri Surabaya, Indonesia.</i>	956-958
123.	High School Students' Science Generic Skill at Sumedang District-West Java <i>P Suhamah, a Setiawan, W Liliawati, Mahasiswa Prodi Magister Pendidikan Fisika SPS UPI, Departemen Pendidikan Fisika, Sekolah Pascasarjana Universitas Pendidikan Indonesia.</i>	959-962
124.	Analysis of Vapor-Pressure Lowering of Solution Concepts as a Basis for Development of Virtual Laboratory and Student's Science Process Skill in Learning Colligative Properties <i>Nenden Natalawati, Ijeng Rohman, Galah Yuliant, Indonesia University of Education, Indonesia.</i>	963-978
125.	Pedagogy Knowledge Matematika Pre-Service Teacher <i>Sartipah, Pendidikan Matematika Universitas Islam Riau, Indonesia</i>	979-983
126.	Developing Advanced Mathematical Thinking Test Based On Pace Model <i>Andri Suryana Indraprasta PGRI University</i>	984-992
127.	Analysis Lesson Plan Mathematics By Curriculum 2013 Implementation Using Inquiry Method <i>Fauzi Mulyatna, Indraprasta PGRI University, Indonesia.</i>	993-1001
128.	The Influence Of Model Learning And Students Interest In Basic Chemical Course 1 Towards The Study Result Of Basic Chemical Course 1 <i>Fatwa Patimah Nursa'adah I, Idha Isnaningrum, Program Studi Pendidikan Matematika, Fakultas Teknik, Matematika dan IPA Universitas Indraprasta PGRI Jakarta, Indonesia.</i>	1002-1007

PEDAGOGY KNOWLEDGE MATHEMATICS PRE-SERVICE TEACHER

Suripah

Department of Mathematics Islamic University of Riau

rifahamin@gmail.com/rifah@edu.uir.ac.id

Key Words:

ABSTRACT

Pedagogy
Knowledge, Pre-
service teacher

This paper aims to describe pre-service teacher's ability to evaluate a case of student work in completing a fractional computing using the media as an effective way of teaching. Based on the case examples analyzed, it appears that there is still a weakness of students in the mastery of learning concepts. Psychologically, students are still weak in developing and mastering the next material as a result of the lack of understanding of teachers in using learning media in teach concepts and principles on the operation of addition.

INTRODUCTION

Teachers have a duty and a stronger role in protecting the public schools, especially in the handling of their students who have diverse properties. Therefore, teachers should have the ability and knowledge of comprehensive initial preparation to teach. Equip prospective teachers to master the subject matter and how teach courses on learners is very important. This is in line with the opinions Lannin et al., (2013) that the knowledge of mathematics and how mathematics is very important to teach the material be managed by novice teachers, because it helps the learning process. (Subanji, 2016: 72), adding that teachers are required to master the material(*content*) and learning (pedagogic).

Establish the concept of content and pedagogical knowledge (Morris, Hiebert, & Spitzer, 2009: 494) describes the four components of

mathematical knowledge for teaching are: 1) General knowledge is knowledge of mathematics is generally known; 2) Specific knowledge is knowledge that is unique and important to teach; 3) Knowledge that combines course content with students' knowledge; and 4) that combines knowledge about lesson content with how to teach.

Correspondingly, the effort put forth for effective pre-service teachers, skilled in teaching in LPTK requires a process and continuity. Likewise, in designing and evaluating teaching during stints is not an easy thing to do. But all the work it takes practice so as to create effective teaching. As stated Hiebert et al, (2009), that in order to produce a skilled teacher after graduation, then education must prepare prospective teachers to learn how to teach when they enter the profession.

Preparing early ability pre-service teacher aim to acquire the skills

needed for learning in a systematic way. Pre-service teacher education program aims to prepare graduates to become qualified teachers are equipped with pedagogical practices that will be beneficial to meet the increasing demands associated with the teaching profession (Darling-Hammond, et al, 2010: 5). As it is said (Carr, 2004) that the pre-service teachers should be given the motivation to explore personal values and how the possibilities are not important to their professional.

However, the fact is that there are in the field, there are still many pre-service teachers who do not understand the importance of planting pedagogical concepts related to the importance of learning and how to evaluate learning. Morris, AK; Hiebert, J & Spitzer, BC, (2009: 491), reported that pre-service teachers can identify subconcepts mathematics learning objectives in the context of the support but do not spontaneously implement strategies for planning the delivery of learning objectives or evaluate learning. (Turnuklu & Yesildere, 2007) found that the pedagogical content knowledge of elementary school pre-service teacher is not enough to teach mathematics.

Problem students' learning difficulties often faced by teachers and parents. Based on previous experience, as parents at home have tried to help children learn in different ways by means of which the teacher taught in schools. However, the results have not been up, citing fear of being wrong and being scolded for not the same as that taught in schools. From this issue precisely as parents feel moved to probe further what exactly is wrong in terms of learning.

Cognitive development of children is very influential on the problem solving process, especially in mathematics. Mathematics learning difficulties can occur due to the weakness of certain concepts in teaching material. With regard to the mathematical concept of a hierarchical structure, the math should be taught gradually. Starting from a simple concept to the higher concept. Weakness in a particular concept will result in a subsequent mastery of the material weakness.

Noting the urgency of learning concepts, psychologically also be aware of how teach concept properly. As a follow up of teachers as facilitators further notice effective way of teaching in order to reduce errors that occur. One is the ability pedagogical pre-service teachers in teaching by using the media as one of the effective ways of teaching.

DISCUSSION

1. *Pedagogy* *Knowledge* **Mathematics**

Shulman, (1986: 4) defines pedagogy as knowledge about how to teach. (Mishra & Koehler, 2006: 1026) said pedagogical knowledge (PK) is deep knowledge about the processes and practices or methods of teaching and learning and how it encompasses, among other things, overall educational purposes, *values, and aims*. The definition implies that the PK is an in-depth knowledge of the processes and learning and includes a practice or teaching methods among others in the form of goals, values, and overall educational goals.

Pedagogical knowledge is a component that is absolutely owned a teacher. However teachers should be

able to solve a problem in certain situations in the classroom. As it is said (Kennedy, 1999: 57)"teachers were asked at several times during this process how they would respond to a set of specific classroom situations". Without clarity of teachers in the teaching plan can be fatal and not achieving a goal of learning. More (Mishra & Koehler, 2006: 127) says that a teacher who has a profound pedagogical knowledge, able to understand how students construct knowledge, acquire skills, and develop the habits, thoughts and positive disposition towards learning.

Measurement of pedagogy knowledge can be done by providing a case study for analysis by pre-service teachers. The case consists of how to teach mathematics, use of media and do an evaluation or assessment.

Furthermore, it can be considered the exposure of prospective teachers in response to the case of material error on the concept of fractional summation operation and feedback. As for prospective teachers feedback related to the assessment of the students' answers, then learning how to fix the errors and how to use media that can be used to correct these errors. Exposure teacher can also be used to dig up information held relating to the ability of pre-service teachers in teaching the material to the students.

2. Case

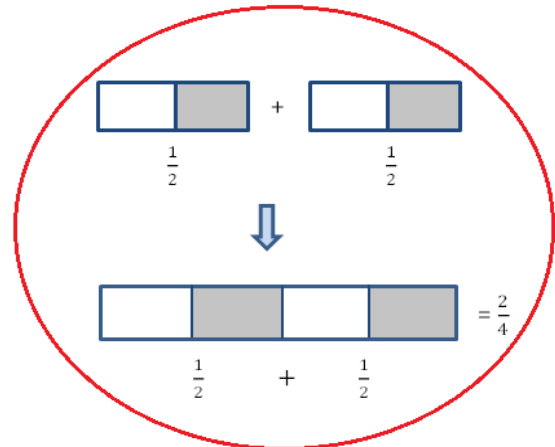
Based on my observation, there are cases as follows:

A student completing the addition operation on broken like below.

$$\frac{1}{2} + \frac{1}{2} = \frac{2}{4}$$

to see the ideas of the students, the teacher further investigate the results of the students' answers. As

for the reasons given by students are as follows:



Based on the above cases, provide an analysis of the responses of the students. How do you assess the students' answers? How do you use the media to carry out the lessons learned to improve the students' mistakes?

The reaction of the majority of prospective teachers looked like did not believe in what the students. As ever gained from previous experience, prospective teachers just think that in working on fractional summation operation can be done by way of equating the denominator. If the fraction is already have denominator same, then stay summing the numerator only. The majority of prospective teachers were surprised, even some teachers almost fooled by the students' answers. Teachers assume that what the student is correct and all this time the teacher was wrong in teaching material. This is evident from the results of interviews with Pre-service teacher A (G_A) as follows:

D: What do you think of cases related to the students' answers?

G_A : The students' answers are logical. I feel unsure of what I've done over the years.

D: How far you add fractions?

G_A: If the denominator is the same, then just add the numerator.

D: Why so?

G_A: That's what I understand.

Based on the statement of G_A, illustrates that the addition operation concept taught by teachers has not been understood by the students. It is appropriate explanation (Subanji, 2016: 72), that during this study only emphasizes the procedure, yet emphasizing on how to develop students' thinking process.

Further exploration revealed G_A as follows:

D: What about adding operation $\frac{1}{2} + \frac{1}{2}$?

G_A: Should the answer $\frac{2}{2}$

D: What is one of the answers are based on thinking he?

G_A: The idea makes sense, but why is the answer wrong yes. "I even confused" ..

D: Do you think of the students described, which shows the number demi? The numerator and denominator are exemplified by what is shown by what?

G_A: The numerator is indicated by a shaded square. While the denominator is indicated by two rectangles (shaded square and that is not shaded)

D: Is it already berpenyebut same denomination? What is the same berpenyebut of illustration.

G_A: yes ... already have denominator same. The square frame are both made up of two squares. Oo ... then the addition operation guiding is as much as two square frame. Add half the last half should be summed are shaded square into a square frame containing two, so the result duaperdua.

D: You convinced with this answer?

G_A: I'm sure. I understand now, the importance of knowing implement media in teaching.

The teacher statement illustrates that seemed plausible answer is not necessarily true. As the results of students' work in summing $\frac{1}{2} + \frac{1}{2} = \frac{2}{4}$, at first glance seem logical, since in representing half into the picture is correct, square summing a way to merge the picture look good, it turns out the final result is false. Finally, teachers are aware of how essential the correct teaching concepts through the medium of learning. This is also reinforced by the results of research (Niess, 2005: 509), which explains the importance of preparing pre-service teachers to master the material and learning by using technology as well as media.

CONCLUSION

Setting up an effective teacher is not as easy as it takes time and continuous process. Master the subject matter has not been enough without the how teach concept well. This relates to the subject matter of mathematics is a tiered, requires a basic concept of mutually reinforcing.

With regard to a case that occurred in the work of students, it appears that there are still weaknesses in the student's mastery of concepts learned. In psychology, the students are weak in developing and mastering the following material as a result of their lack of understanding of teachers in the use of instructional media in teaching the concepts and principles of the addition operation.

The solution of the completion of the case is the teacher teaches the

concepts well, then teachers learn to use instructional media to understand the concept correctly. More teachers can instill thought to students that learning is a process. Students should not be afraid to try out with the ability to understand. No less important is the mastery of pedagogical pre-service teachers as the provision of professionalism in the future.

ACKNOWLEDGEMENT

We would like to thanks for BUDI DN (merger from LPDP and RISTEK DIKTI) for his funding in our study.

REFERENCES:

- Carr, D. (2004). Moral Values and the Arts in Environmental Education: Towards an Ethics of Aesthetic Appreciation, *38*(2).
- Darling-Hammond, L. et al. (2010). *Principals Preparing For A Changing World*. San Francisco: John Wiley and Sons.
- Kennedy, MM (1999). The role of preservice teacher education. *Teaching as the Learning Profession: Handbook of Teaching and Policy*, 54-86.
- Lannin, JK, Webb, M., Chval, K., Arbaugh, F. Hicks, S., Taylor, C., & Bruton, R. (2013). The development of beginning mathematics teacher pedagogical content knowledge. *Journal of Mathematics Teacher Education*, *16*(6), 403-426.
- Mishra, P., & Koehler, MJ (2006). Technological Pedagogical Content Knowledge: A Framework for Integrating Technology in Teacher Knowledge. *Teachers College Record*, *108*(6), 1017-1054.
- Morris, AK, Hiebert, J., & Spitzer, SM (2009). Mathematical Knowledge for Teaching in Planning and Evaluating Instruction: What Preservice Teachers Can Learn? *Journal for Research in Mathematics*, *40*(5), 491-529.
- Niess, ML (2005). Preparing teachers to teach science and mathematics with technology: Developing a technology pedagogical content knowledge. *Teaching and Teacher Education*, *21*(5), 509-523.
- Subanji. (2016). Peningkatan Pedagogical Content Knowledge Guru Matematika Dan Praktiknya Dalam Pembelajaran Melalui Model Pelatihan Teqip. *Jurnal Ilmu Pendidikan*, *21*(1), 71-79.
- Turnuklu, EB, & Yesildere, S. (2007). The pedagogical content knowledge in mathematics: preservice primary mathematics teachers, perspectives in turkey. *IUMPST: The Journal IUMPST, Vol 1*, 1-13.

Certificate

NO: 008/ICONS-PGRI/VII/2017



Suripah

Has attended the 2017 International Conference On
Education And Science (ICONS 2017)
"Character Development In The 21st Century Education"
at Universitas PGRI Yogyakarta (Indonesia), July 20th, 2017 as

Author

Rector

University of PGRI Yogyakarta

Prof. Dr. Buchory MS., M.Pd

Rector

IKIP PGRI Wates

Dr. M. Jumartin, M.Pd

Rector

University of Indraprasta PGRI

Prof. Dr. Sumaryoto

Rector

University of PGRI Semarang

Dr. Muhdi, SH, M.Hum

President of National Board PGRI

Dr. Unifah Rosyidi, M.Pd