Strengthening of Mathematics Character Education Students (Teacher Candidates) in Facing the Challenges of the 21st Century

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Abstract. In the 21st century, professional mathematics teachers are very necessary for developing of mathematics education. To become a professional mathematic teacher, there are several competencies that must be mastered by teacher-candidate students when studying at LPTK, which are knowledge, practice, and attitude. So, they can become a professional teacher in guiding students. Besides, professional mathematics teachers also need 21st century skills, in order to face the global challenges of the 21st century. To face these challenges, the students must learn ICT development and master 4C skills. Therefore, LPTK as the education of teacher candidates must equip their students by providing 4C skills, which are Critical Thinking, Communication, Collaboration, and Creativity. So, Mathematics students as teacher candidates are ready to face the challenges of the 21st century well, as they have good characters. These characters aim to provide teacher candidates who are persistent, competitive, moral, tolerant, mutual cooperative, work hard, science and technology minded, and religious based on Pancasila as the principle of Indonesia. These lead the students to easily face the challenges of education in the 21st century.

Keywords: character education strengthening, mathematics teacher-candidate students, 21st century challenge

INTRODUCTION

Teacher-candidate students are the students who study at Lembaga Pendidikan Tenaga Kependidikan (LPTK) or Institute of Teacher Training Education [1]. The Mathematics teacher candidates are LPTK students who study Mathematics Education program, and they become professional Mathematics teachers when passing the Professional Education Program (PPG). This is in accordance with Government Regulation Number 19 of 2017 concerning Amendments to Government Regulation Number 74 of 2008 concerning teachers [2], which states that teachers are professional educators whose main duties are educating, teaching, guiding, directing, training, and evaluating students in field of education.

As Mathematics teacher candidates, they must professionally have the knowledge about mathematics, attitudes, and teaching skills. Therefore, LPTK as an education institution would provide candidates with those skills well so that they could become professional mathematics teachers. This is in accordance with the Law Number 14 of 2005 [3], concerning Teachers and Lecturers, which states that professional teachers must have competency of educational competence, professional competence, personal competence, and social competence.

The 21st century challenge emphasizes Mathematics teacher-candidate students to master ICT development and the 4C skills. Therefore, LPTK, as a provider of teacher candidates education, has to instill 4C skills to their students (teacher candidates) well, to make them competitive in the global era. The students’ character building aims to provide the teacher candidates who are persistent, competitive, moral, tolerant, mutual cooperative, work hard, science and technology minded, and religious to face the challenges of education in the 21st century based on Pancasila as the principle of Indonesia [5].

METHOD

The method used in this study is library research. The writers used literature studies of books, references, notes, and research reports. This is in accordance with the definition of literature study as a theoretical study, reference book, and studies other relevant scientific literature relating to ideas, as well as objects and social situations studied [6].

The data used in this study were the result of a theoretical study to strengthen the Mathematics teacher-candidate students’ character in the challenges of the 21st century referring to various trusted sources, such as reference books, scientific journals, internet sites, and other relevant literatures. The data sources were reference books, scientific journals, and relevant articles from internet sites related to the topic of study. To collect data, the writers used documentations, such as notes, books, references, articles, and journals to find out variables. [7].

The data analysis techniques of this study were content analysis and description analysis techniques.
Content analysis technique was used to obtain valid theoretical studies to be reexamined based on the context [8]. Here, the process of selecting theory will be carried out to compare various theories, combine and sort various theoretical studies to find relevant theories [9]. While the description analysis technique was used to describe the results of the content analysis.

RESULT

LPTK is an institution that prepares students as teacher candidates. This is in accordance with the Law Number 14 of 2005 concerning Teachers and Lecturers, explicitly to provide teacher candidates held by LPTK through Faculty of Teacher Training and Education/FKIP [3]. While teacher candidates are students of LPTK [1].

The Mathematics teacher candidate must have the ability of mathematical knowledge, attitudes, and teaching skills. LPTK as an education institution would provide candidates with those skills so that they could become professional mathematics teachers. This is in accordance with the Law Number 14 of 2005 [3], concerning Teachers and Lecturers, which states that professional teachers must have competency of educational competence, professional competence, personal competence, and social competence through professional education, namely PPG [3]. Meanwhile, AITSL states that to become a professional mathematics teacher, there are several competencies must be mastered by students (teacher candidates) when studying at LPTK, namely professionals in the knowledge, practice, and attitude fields [10].

In the 21st century, it is very necessary for professional mathematics teachers to advance Mathematics education. This is in accordance with the Government Regulation Number 19 of 2017 concerning Amendments to Government Regulation Number 74 of 2008 concerning Teachers. A professional teacher has an undergraduate academic qualification, and their professional certificate is obtained through professional education (PPG) [2]. Through guidance from professional teachers, students can become human resources who are good, competitive, and productive to face the challenges of global competition in the 21st century. One of the skills needed in education is 21st Century Skills (4C skills) as integrated in learning activities at LPTK. If learning in LPTK prioritizes the achievement of graduates of professional teacher candidates, it is necessary to develop 4C skills in their learning activities.

Through Professional Teacher Education Program (PPG), LPTK is appointed by the government referring to Teacher Education Standards, which are education standards, research standards, and community service. The PPG program is implemented to improve the quality of education and learning process in accordance with Ministry of Research, Technology and Higher Education Regulation Number 44 of 2015 concerning National Standards for Higher Education (SN-Dikti) [11] and Ministry of Research, Technology and Higher Education Regulation Number 55 of 2017 concerning Teacher Education Standards [12].

The 21st century challenge has complex characteristics. It includes Mathematics students’ mastering ICT development and the 4C of 21st Century Skills and a paradigm of democratic education, which is full of openness, challenge, cooperation, and students’ responsibility. The 21st century education [13] aims to provide human resources who are qualified, globally competitive, independent, hard working, and able to recognize the ideals of the nation in order to compete globally. This is in accordance with the opinion of Ackoff & Greenberg which says “Education does not depend on teaching and learning, but rather on the other motivated, and self-initiated actions of the learner” [14].

The 21st century education refers to three educational concepts that have been adapted by the Ministry of Education and Culture of Indonesia. The concepts include 21st Century Skills [15], scientific approach, [16] and authentic assessment [17]; [18] - [20]. The 21st century education is based on the 21st Century Skills concept, namely the basic character of 4C. According to the Asian National Educational Association, four things need to be developed to face the 21st century as the globalization era as 4C: (1) Critical Thinking, (2) Communication, (3) Collaboration, and (4) Creativity [4]. Learning must consider 4C to help prepare students (teacher candidates) to face global competition. First, Critical thinking is the ability to understand a complex problem and to associate information with another information, to find the best solution. Second, Communication is an activity of transferring or conveying information verbally or written to the recipients. Third, Collaborative is the ability to collaborate work with others, synergize, adapt, have responsibility, work productively, and have tolerance to respect differences. Fourth, Creativity is the ability to develop, to convey new ideas to others, and being open to new and different opinions.

In addition, teacher-candidate students must also have good characters. These characters aim to provide the teacher candidates who are persistent, competitive, moral, tolerant, mutual cooperative, work hard, science and technology minded, and religious to face the challenges of education in the 21st century based on Pancasila as the principle of Indonesia. This is also in accordance with the Law Number 20 of 2003 concerning the National Education System that develops the students’ character building. It comprises good dignity of education in developing the students’ spirituality, knowledge, skills, creative thinking, independence, and responsibility.

Pengukatan Pendidikan Karakter (PPK) or strengthening of character education is a process of transforming and developing students’ ability to think critically and creatively, and behave according to Pancasila principles [21]. Therefore, the benefits of PPK for Mathematics teacher-candidate students are to strengthen their characters in accordance with PPK values and the 4C skills. The PPK values can develop the
skills to live in 21st century, such as critically and creatively thinking, good communication skill, mutual collaboration and cooperation, good adaption and adjustment to the environment, high passion and imagination, and a high literacy spirit.

CONCLUSION

Teacher-candidate students are those who study Mathematics education at LPTK to become professional teachers. They have to master several competencies, such as educational, professional, personal, and social competencies. The professional competency is in the field of knowledge, practice, and attitude as well. In addition, Mathematics teacher-candidate students need 21st Century Skills to face the global challenge. The challenges require students to master ICT development and 4C skills.

Therefore, LPTK provides their students to be ready to face these challenges by teaching 4C of 21st Century Skills: Critical Thinking, Communication, Collaboration, and Creativity. To face the challenges of the 21st century well, the Mathematics teacher-candidate students must have good characters. These characters aim to provide the teacher candidates who are persistent, competitive, moral, tolerant, mutual cooperative, work hard, science and technology minded, and religious to face the challenges of education in the 21st century based on Pancasila as the principle of Indonesia. Meanwhile, the benefits of PPK for the students are to strengthen their characters in accordance with PPK values and improve the competitiveness of the students using the 4C skills.

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