How does the high school mathematics teacher prepares the learning process based on the 2013 curriculum 2017 revision

I A Latif, D R S Saputro and Riyadi

1Mathematics Education Department of Graduate Program Sebelas Maret University, Jl. Ir. Sutami 36A Kentingan Jebres Surakarta 57126, INDONESIA

*Corresponding author: al_ikhsan@student.uns.ac.id

Abstract. 2013 Curriculum (K13) provides an opportunity for students to develop the potential attitudes, knowledge, and skills necessary for life and society and contribute to the welfare of human life. The K13 2017 revision requires teachers to integrate 21st-century skills in the learning process. They are consist of critical thinking and problem-solving, communication, creativity and innovation, and collaboration (4C skills), Higher Order Thinking Skills (HOTS), literacy movement, and character education. This study is a qualitative research that aims to describe the steps performed by a high school mathematics teacher in preparing the Lesson Plan (RPP) in accordance with K13 2017 revision. The subject of this study is a Civil Servant Mathematics teacher at SMAN 1 Wuryantoro, Wonogiri Regency. This study used interview method with time triangulation technique to obtain valid data. Based on the interviews it is concluded that in preparing the RPP in accordance with K13 revision 2017, the teacher is guided by The Minister of Education and Culture Regulation (Permendikbud) Number 22 of 2016 and Pedoman Penyusunan RPP Abad 21. The first step taken by the teacher in preparing and developing RPP is quoting KI from Permendikbud Number 21 2016 and KD from Permendikbud Number 24 of 2016. After that, teacher formulates Indicators of Competency Achievement (IPK) in accordance with KD, learning objectives in accordance with IPK, learning materials in accordance with IPK, learning activities integrating 21st-century skills and in line with learning objectives, learning assessment instruments, and learning reflection activities.

1. Introduction

The Government has made various changes in the field of education to improve the quality of education. The curriculum is a means to improve the quality of education. Curriculum is central to all the processes and experiences occurring in school settings [1]. The curriculum is a set of plans and arrangements on learning objectives, content, and materials and the way used as guidelines for the implementation of learning activities to achieve specific educational objectives [2]. There are ten curricula that have been applied in Indonesia since 1945 to the present. They are the Rentjana Pelajaran 1947, Rentjana Pelajaran Terurai 1952, Rentjana Pendidikan 1964, 1975 Curriculum, 1984 Curriculum, 1994 Curriculum, Kurikulum Berbasis Kompetensi (KBK), Kurikulum Tingkat Satuan Pendidikan (KTSP), and 2013 Curriculum.

2013 Curriculum or called as K13 is the development of KBK in 2004 dan KTSP in 2006. K13 is a curriculum that began to apply in the academic year 2013/2014 which has two dimensions, namely plans and arrangement of objectives, content, and lesson materials and the ways used for learning activities [3]. K13 is oriented on improving and balancing the competence of attitudes, knowledge,
and skills. Thus, the learning plans, activities, and assessment of K13 are certainly different from the previous curriculum. However, the issues underlying the change from the KBK to K-13 were the failure of the former curricula, the anticipation demographic and economic circumstances in the future, and the benefits offered within the change [4]. The perspective of environmental education in the curriculum 2013 is packed with the expectations that learners gain awareness and sensitivity, gain a variety of experience and a basic understanding of the environment, as well as form the character in order to obtain a set of values of environmentally sensitive feeling in the level of basic education up to the secondary education [5].

K13 has undergone several improvements and developments since it was set in 2013. The improvement of K13 aims to harmonize ideas, designs, documents, and implementation. In particular, the 2013 Curriculum improvements are aimed to align the Core Competence (KI) with Basic Competencies (KD), syllabi, learning inspirations, learning guides, student result assessments, and textbooks [6]. The K13 2017 revision should integrate 4C skills, HOTS questions, literacy movement, and character education so that the learning plan must also integrate 4C skills, HOTS questions, literacy movement, and character education.

The learning plan is arranged in the form of syllabus and RPP which refers to the content standard. RPP is a learning activity plan for one or more meetings developed from the syllabus. Each teacher is required to develop a complete Lesson Plan so that the learning process be interactive, inspirational, fun, challenging, efficient, motivating students to participate actively, and providing sufficient space for initiative, creativity, and independence according to their talents, interests, physical, and psychological [6]. The components of RPP are identity, KI, learning objectives, KD and IPK, learning materials, learning methods, learning media, learning resources, learning activities, and assessment of learning outcomes [7].

RPP is one of the keys to the success of the education process. Lesson plan is a written description for this process; where the materials, the method, the time and the place of education as well as methods for evaluating the students are described in detail [8]. Lesson plan practices such as daily, overall yearly, and substitute teacher lesson plans are reviewed [9]. RPP can be prepared before the semester or school year begins however it needs to be developed and updated before the lesson is implemented. The learning development according to the 21st-Century skills has also planned from analyzing the KI and KD to compile the RPP. The 21st-Century skill character can be developed according to the characteristics of KD and the discussed material. [10]. The development of RPP can be done by teachers independently and/or grouped in schools/madrasah and it can be coordinated, facilitated, and supervised by the principal. The development of RPP can also be done by teachers in groups between schools or regions that can be coordinated, facilitated, and supervised by the Local Ministry Education or Religion offices [6].

Teacher’s readiness and understanding of the curriculum itself are the factors affecting the successful implementation of K13. The teachers’ lack of knowledge and understanding about the pedagogical practices promoted by the new curriculum and the nature of the competencies, together with their narrow interpretation of these, seems to have influenced, if not overtly encouraged, the retention of traditional approaches to pedagogy [7]. When teachers are curriculum-makers, they can be contingently responsive to the needs and interests of students, not just state mandates [8]. In fact, many teachers complain about K13 enactment. According to them, learning with K13 further adds teachers’ administrative tasks ranging from plans to learning reporting. The implementation of 2013 Curriculum, which has been established by the government, makes most of the school educators throughout Indonesia try hard to implement the curriculum [9]. Teachers need continuous professional development in order to enhance their professional skills and construct knowledge that they need in implementing the new curriculum [10].

RPP is often a major obstacle among teachers. In lesson planning and course measurement tools, teachers had the most questions with specific deficiencies [11]. Some of the contributing factors are they have not fully understood the essence of each RPP component, they have not read earnestly or never read the learning rules, the ease of obtaining RPP files from another teacher even though they
are not applicable in their class because of the modalities, characteristics, and differences students' potential, however, the RPP is still being used, and the tendency to think that the RPP is an administrative fulfillment only [12]. The government has conducted technical guidance on K13 implementation to overcome the teachers’ misunderstandings. The technical guidance on K13 implementation targets all teachers from various educational units. Procurement of reference books, laboratory equipments, ICT and other teaching resources by the central government was also addressed and propagated to meet the demands of curriculum [13].

This study aims to describe the steps of teacher in preparing the RPP based on the K13 2017 revision. The RPP is an important element in the learning activities. Planning is the systematic process of deciding what and how students should learn [14]. A teacher must strive to think and plan carefully to improve the quality of teaching and learning opportunities for their students [15]. The RPP not only describes how the teacher teaches but also how the classroom management is good. This means that teachers’ conceptions and practice of improvisation must be related to discussions about value-based instructions regarding what to do in school and about curriculum contents and teaching skills [16]. In K13 2017, teachers are required to make RPP before teaching in a class that integrates 4C skills, HOTS questions, literacy movement, and character education. The RPP must be accorded to the latest guideline that is applicable to Permendikbud Number 22 of 2016 and Pedoman Penyusunan RPP Abad 21.

2. Methods
This study is qualitative research that aims to know the steps of a Mathematics teacher in preparing the RPP based on the K13 2017 revision. Qualitative researchers begin with self-assessment and reflection about themself as situated in a social-historical context [17]. Qualitative research aims to provide in-depth insights and understanding of real-world problems and, in contrast to quantitative research, it does not introduce treatments, manipulate or quantify predefined variables [18]. This study was conducted in several stages are determination of subject, data collection, and data analysis

2.1. Participants
The first step in this study is the selection of research subjects. The subject of this study is a Mathematics teacher at SMAN 1 Wuryantoro Kabupaten Wonogiri. Sampling in this research using purposive sampling technique. Researchers choose teachers who have status as Civil Servant and followed the Technical Guidance Implementation K13 2017 revision. In addition, considered also teachers who have good communication.

2.2. Data Collection
The second step of this study is data collection. The data in this research is the data in the form of words about the teacher's step in planning the learning obtained through interview. Data collection techniques in this study through in-depth interviews. Researchers ask about how does the teacher steps in preparing the RPP.

2.3. Data Analysis
The last step in this study is data analysis. The data analysis technique of this study is done by describing the data that have been collected through interview. Data analysis is done in three stages of data reduction, data presentation, and conclusion.

After the data collected, the researcher did the data reduction. Data reduction is the focus of attention on simplification, validation, and transformation of course data arising from field notes. After the data is reduced, the next step is data presentation or data description in the form of short description according to the subject matter. The last stage is the conclusion. Conclusions are expected to be new findings that have never existed before. This study used time triangulation technique to obtain valid data.
3. Results
Planning of the learning activities is an important process in the implementation of the curriculum. RPP is a written documentation of the lesson planning that was prepared before the learning activities were conducted. Civil Servant Mathematics teacher at SMAN 1 Wuryantoro, Wonogiri Regency compiled the RPP in accordance with Permendikbud Number 22 of 2016. The preparation of the RPP in accordance with Permendikbud Number 22 of 2016 indicates that the teacher has implemented the preparation of the expected learning plan in K13. In addition, teachers are also guided by the 21st Century RPP Preparation Guidelines for teacher-prepared RPPs in accordance with K13 2017 revision that integrates 4C skills, HOTS questions, literacy movement, and character education.

The teacher prepares the RPP before the semester begins, then develops it before the learning takes place. RPP development is based on the previous learning outcomes. The first step that teachers do is to quote KI from Permendikbud Number 21 of 2016 and KD from Permendikbud Number 24 of 2016. KD is a minimal ability and minimal learning materials that must be achieved by learners for a subject in each educational unit that refers to the KI.

3.1. Formulating IPK
The teacher develops a KD into several IPKs that match the characteristics and abilities of the students. Teacher formulates IPK using measurable and observable verbs. The verb used is adapted to the level of competence in a KD. The teacher determines the IPK in accordance with KD. If a KD up to C3's ability, then the teacher writes the IPK for the competencies C2, C3, and/or C4 which are of course adjusted to the student's ability.

3.2. Formulating Learning Objectives
The teacher formulates the learning objectives based on the IPK that have been made. Learning objectives are formulated based on elements of Audience, Behavior, Condition, and Degree. Audience means the target or subject that must achieve the learning objectives. Behavior is a behavioral change that is expected to emerge after learning. The condition is a condition that must be met or done. Degree is the minimum limit of the lowest expected success rate.

3.3. Choosing the Learning Materials
The teacher divides the material into three, namely regular, enrichment, and remedial learning materials. Regular learning materials are learning materials delivered to all students in the classroom. Enrichment learning materials are additional learning materials given to students who have exceeded the minimum standard of graduation so that they can develop their potential optimally by utilizing the remaining time they have. Remedial learning materials are learning materials that are given to students who have not reached their minimum competence in a certain KD.

Learning materials are selected to help students master the expected KD. Teachers have principles in choosing the material, that is learning materials in accordance with the intellectual level and needs of students, learning materials arranged in the correct order starting from facts, concepts, principles, and procedures, learning materials written in accordance with the allocation of time.

3.4. Formulating Learning Activities
The learning activities use learning method with the scientific approach. The teacher chooses the learning methods to be applied to learning activities by considering the characteristics of learning materials, learning facilities and infrastructure, student skills, and time allocation. The teacher often uses the Problem Based Learning and Discovery Learning methods in the learning process because they train students to be active and discover for themselves the concept of learning materials.

The learning activities are described in a learning step which consists of preliminary, core, and closing activities. In the preliminary activities, the teacher provides motivation, conveys apperception, explains the learning objectives, and notifies the activities to be performed. The teacher provides
motivation on the importance of learning Mathematics and the importance of studying the material to
be discussed. The teacher gives apperception by asking questions relating to the previous material.
In the core activities, teacher applies previously planned learning methods. The teacher writes the
learning steps according to the syntax of the chosen learning method. The learning steps that integrate
4C skills are reflected in the activities of forming student discussion groups and presentations. The
learning steps that integrate literacy movements are reflected in the activities of students seeking and
reading references from various sources. The learning steps that integrate HOTS are reflected in
teacher activities addressing problem-based questions that require deep student understanding. The
teacher does not ask questions about counting or determining problem-solving outcomes.
In closing activities, the teacher gives assignments or homework, reflects on the lesson, provides
feedback on the learning process, and delivers the material to be discussed at the next meeting.
Reflection learning is done to evaluate all learning activities. Feedback is done by making an
assessment.

3.5. Making the Instument of Learning Outcomes Assessment
Guru The teacher develops a learning achievement assessment instrument to measure student
achievement of a KD. In developing the assessment instrument, the teacher first determines the test
objectives then analyzes the KD and IPK, makes the grid, and makes the item.

There are two kinds of test objectives that teachers are formative and summative. The formative
test is a test to determine the achievement of learning objectives undertaken. In formative tests,
teachers provide feedback to students or themselves about the learning process. While the summative
test is a test conducted to determine the level of student understanding. The summative test is a student
score in achieving a KD.

The teacher develops instruments based on KD and IPK with the aim to determine the weight and
number of items. Instruments based on KD and IPK can be used to determine the achievement of
learning objectives. Instruments are also arranged in accordance with activities and learning materials.

The teacher makes items that contain the scope of attitudes, knowledge, and skills. The test
instrument of knowledge and skill in the matter of essays containing HOTS. Instrument attitudes
tangible observation sheet, self-assessment, assessment between friends, and journals.

3.6. Reflection Activities of Learning Process
The reflection activities of learning process is a teacher activity that involves students to review and
introspection of teaching and learning process that has been done, including planning, implementation,
and learning outcomes. Reflection of learning process has functions to know student understanding
and means of feedback for the teacher to know the success level in guiding student. Information
gained from feedback is helpful for teachers to design and improve learning.

Teacher carries out learning reflections at the end of each learning activity. In reflection activities,
teachers ask students to write their opinions and impressions during the learning process. The teacher
asks the students about what material they have learned, what benefits they derive from the material,
what positive attitudes they get during learning, what they do to learn better, and whether the learning
method is easy to follow. In addition, teachers also reflect themselves on the implementation of
planned teaching methods, student participation in learning, learning environment, and obstacles
encountered in learning.

4. Conclusion
The K13 2017 revision aims to have students of 21st-century skills so as to compete globally.
Learning activities in K13 revision 2017 should integrate 4C skills, HOTS questions, literacy
movement, and character education so that planning the lesson should consider the integration of 4C
skills, HOTS questions, literacy movement, and character education.

Preparing lessons is an activity that teachers must perform before teaching. In preparing the lesson,
the teacher prepares the lesson plan. The lesson plans are syllabus and RPP. The RPP is prepared for
each meeting. The teacher is guided by Permendikbud Number 22 of 2016 and *Pedoman Penyusunan RPP Abad 21* in creating RPP. RPP component consists of identity, learning objectives, KD and IPK, learning materials, learning methods, learning media, learning resources, learning steps, and assessment of learning outcomes. The teacher prepares the RPP before the semester begins, then develops it before the learning takes place.

The first step of the teacher in preparing and developing the RPP is to quote KI from Permendikbud Number 21 of 2016 and KD from Permendikbud Number 24 of 2016. After that, the teacher formulates IPK in accordance with KD, the learning objectives in accordance with IPK, learning materials in accordance with IPK, learning activities that integrate 21st century skills and in accordance with learning objectives, learning assessment instruments, and reflection learning activities.

**References**

[1] Shilling T 2013 *Journal of Curriculum and Instruction* 7 20.
[2] Undang-Undang Nomor 20 Tahun 2003 Tentang Sistem Pendidikan Nasional.
[3] Peraturan Menteri Pendidikan dan Kebudayaan Nomor 69 Tahun 2013 Tentang Kerangka Dasar dan Struktur Kurikulum Sekolah Menengah Atas/Madrasah Aliyah.
[4] Ahmad D 2014 *International Journal of Enhanced Research in Educational Development* 2 6.
[5] Rudi P C 2015 *International Journal of Research Studies in Education* 4 83.
[6] Sunardi and Sujadi I 2017 *Sumber Belajar Calon Peserta Program PLPG Mata Pelajaran Pedagogi: Kurikulum 2013* (Jakarta: Kementerian Pendidikan dan Kebudayaan).
[7] Goodwin L and Kosnik C 2013 *Teacher Development: An International Journal of teachers’ Professional Development* 17 340.
[8] Rumahlatu D, Huliselan E K and Takaria J 2016 *International Journal of Environmental & Science Education* 11 5663.
[9] Yulianti K 2015 *International Journal about Parents in Education* 9 166.
[10] Gokalp M 2016 *Eurasia Journal of Mathematics, Science & Technology Education* 12 509.
[11] Direktorat Pembinaan Sekolah Menengah Atas 2017 *Model Pengembangan RPP* (Jakarta: Direktorat Jenderal Pendidikan Dasar dan Menengah, Kementerian Pendidikan dan Kebudayaan).
[12] Tanag H and Abu B 2014 *Journal of Curriculum and Teaching* 3 35.
[13] Cicek V and Tok H 2014 *International Journal of Teaching and Education* 2 11.
[14] Hakim A 2015 *The International Journal Of Engineering And Science* 4 4.
[15] Maeland K and Espeland M 2017 *Education Inquiry* 8 194.
[16] Choy L T 2014 *IOSR Journal of Humanities and Social Science* 19 99.
[17] Moser A and Korstjens I 2017 *European Journal of General Practice* 23 271.