

Is Credit System Serving Three Types of Students? Teacher and Student Perspectives in the Implementation of Mathematics Learning

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Abstract. Students should receive educational services according to their talents, interests, and abilities. Therefore, a learning system should accommodate fast, normal, and slow learners. This study aims to identify the perspective of teachers and second graders on the application of the Credit System in Yogyakarta secondary schools, the constraints, as well as strategies in implementing the Credit System. The study is phenomenological research. The data was collected using interviews and focus group discussion results. The participants were students and teachers who carried out the Credit System for learning mathematics. The data analysis was done using the Bogdan & Biklen approach. The results of the study show that teachers and students still find difficulty carrying out credit systems. The causes of these students' perspectives are that students are not used to learning independently and teachers are still confused about doing Credit Systems learning to serve all types of students. The strategy of this challenge is to add hours to types of fast learner and teachers make modules that are easy to understand for all types of learner.

Keywords: credit system, mathematics, teacher and student perspective.

Abstrak. Peserta didik dapat memperoleh layanan pendidikan sesuai dengan bakat, minat, dan kemampuannya pada setiap satuan pendidikan. Oleh karena itu sistem pembelajaran harus mengakomodasi peserta didik yang cepat, normal, dan lambat. Penelitian ini bertujuan untuk mengidentifikasi perspektif guru dan siswa kelas II tentang penerapan Sistem Kredit Semester di SMA Negeri Yogyakarta, kendala-kendalanya, serta strategi penerapan Sistem Kredit Semester. Jenis penelitian ini adalah penelitian fenomenologis. Pengumpulan data dilakukan dengan menggunakan wawancara dan hasil focus group discussion. Subjek penelitian adalah siswa dan guru yang melaksanakan Sistem Kredit Semester dalam pembelajaran matematika. Analisis data dilakukan dengan menggunakan pendekatan Bogdan & Biklen. Hasil penelitian menunjukkan bahwa guru dan siswa masih mengalami kesulitan untuk melaksanakan Sistem Kredit Semester. Penyebab dari cara pandang siswa tersebut

adalah siswa belum terbiasa belajar mandiri dan guru masih bingung melakukan pembelajaran Sistem Kredit Semester untuk melayani semua jenis siswa. Strategi dari tantangan ini adalah menambah jam untuk tipe siswa yang cepat belajar dan pengajar membuat modul yang mudah dipahami untuk semua tipe pembelajar.

Kata Kunci: sistem kredit semester, matematika, perspektif siswa dan guru

Introduction

Students can get educational services according to their talents, interests, and abilities in each education unit. These differences in talents, interests, and abilities can affect students' learning process and participation in the classroom (Solomon, [2007](#)). But the implementation of mathematics learning is still influenced by teachers' thoughts and knowledge of teachers not based on the diversity of students' talents, interests, and abilities (Choppin, [2011](#)).

The implementation of learning is difficult to facilitate the interests, talents, and speed of different students and is a challenge for teachers in integrating students who are in accordance with the mental and emotional learners (Renzulli, [2008](#)). In regular learning the teacher is difficult to realize the interests and talents of students, so that interest and talent will not be seen (Shayshon et.al, [2014](#)). Teachers will focus more on students who have learning difficulties than students who have high potential (Krieg, [2008](#)). This will result in the interests, talents, and speed of students who have high potential must wait for students who have learning difficulties.

Lassig ([2003](#)) stated that students who have high talent will experience boredom and can withstand the curiosity of their intellectuals. Even though the ability of students according to their interests and talents must be recognized because it is not only for students' self-development but will be useful for the country (Bulgar, [2008](#)). According to Guang & Hong ([2015](#)) the separation groups of students according to their talents, interests, and speed can provide maximum progress both for weak learners, talented students, and can prevent learning inhibition from other friends.

The role of the teacher in the classroom to facilitate the interests, talents, and speed of different students is one of the determinants of student achievement. However, if one class consists only of homogeneous students, namely talented students are united in one class and students are slow in one class, then this will cause concern, namely the labeling and grouping of talented and non-talented students. Therefore, in fulfilling the services of students, the government carries out the Credit System.

The Credit System is an education management system that allows students to determine their own choices in taking the number of credit hours in a semester. A student can choose to set his own pace of learning, plan and sequence his choices, or acquire skills through additional facilities (Chaubey et al., [2015](#); Phadnis, [2019](#); Chaubey et al., [2015](#)). Students can also develop themselves by studying other subjects besides the core subjects (Kapur, [2017](#)). The Credit System has several advantages, namely: 1) students can develop their creativity, 2) facilitate student-centered learning, 3) develop analytical skills that can integrate values (Biswas, [2018](#)).

In the education, Credit System is not new, developed countries such as the United States and Korea have implemented Credit System programs in secondary schools. The implementation of Credit System learning in America is conducted for 10 weeks with a five-day learning system. The curriculum consists of English, foreign languages, history, science and students must complete 6 to 7 credits per year for 120 hours in one year. In learning mathematics of Credit System that must be taken by students in America is as many as three, namely algebra I, geometry, and algebra II. Whereas for trigonometry material and other material is the Credit System of choice. Students who complete credit in new algebra can proceed to geometry or credit that is relevant to the work to be taken, and for the third credit, students may choose algebra II or integration mathematics which is adjusted to the continuation of the college to be chosen or the work that will taken (The Washington State Board Education, [2012](#)).

Meanwhile the implementation of Credit System learning in Korea is called the High School Credit Policy (HSCP). It focuses on diversity and curriculum choices for college entrance examinations and evaluations. This credit system was influenced by the first modern schools which opened in 1883–1910 with the help of American and European missionaries (Kim et al, [2021](#)). Learning with Credit System is managed in the form of differentiated learning for each group of learners who are different in learning speed which is divided into fast learners, normal learners, and slow learners. Students who have not reached mastery level or have not yet reached the Minimum Completeness Criteria are included in the slow learner, for those who have reached the Minimum Completeness Criteria including normal learners, and those who exceed the Minimum Completeness Criteria include fast learners. In serving the speed of student learning, learning in the Credit System uses Independent Learning Activity Unit (ILAU). The Independent Learning Activity Unit is a unit of learning that is arranged sequentially from the easy to the hard based on the students' learning mastery of the knowledge and skills arranged into

units. The Credit System is adjusted to the core competencies and basic competencies that must be mastered by high school students in learning mathematics every semester. This credit system can be used as an evaluation material for policies in the field of education (Kokebayeva & Mussabalina, [2015](#)).

Many senior high schools in Indonesia have implemented a lot of semester credits. Many studies also conclude that the Semester Credit System has been running well and there are no significant obstacles in the planning process to the overall implementation, such as in SMA N 1 Salatiga (Hardini, [2016](#); Budiyanto et al., [2020](#)), SMA Negeri 1 Kudus (Nafia, [2017](#)), and SMA Negeri Bali Mandara (Qomariyah et al., [2019](#)). However, examples of schools that have implemented the Semester Credit System have not explained in learning mathematics. In addition, there are still schools that feeling not optimal in the implementation of the Semester Credit System seperti SMA N 1 Pekalongan (Naufal et al., [2020](#)).

Based on the description above, the researcher is interested in uncovering facts about impropriety, obstacles, and learning strategies of mathematics that are in accordance with the Credit System in secondary schools. This can be used as an evaluation material so that the implementation of the credit system in learning mathematics can be better.

Method

This study is qualitative research using phenomenological approach which refers to Bogdan and Biklen. This research interprets events and human interactions and the achievement of meanings that are given by others to their own situations. Qualitative data analysis is an effort made by working with data, organizing data, sorting it into manageable units, synthesizing it, looking for and finding patterns, finding what is important and what is learned, and deciding what to do other people can tell (Moleong, [2007](#)). The data were obtained through interviewing to 7 students who were divided into 3 slow learner, 2 normal learner, and 2 fast learners. Researchers use questions that have been validated by expert lecturers. The question consists of the implementation of mathematics learning in Credit System and the student perspective in the implementation of mathematics learning in Credit Sytem. The teacher perspectives and the strategies to overcome the obstacles in the implementation of mathematics learning in Credit Sytem were identified by Focus Group Discussion (FGD) in depth interviews. The FGD involved four mathematics teachers of senior high school from one school that applying Credit System. Three teachers taught compulsory mathematics and one

teacher taught mathematics in the teacher study. The data were analyzed using Bogdan & Biklen approaches, approach, through reducing data, categorizing the data into themes and sub-themes, and then making conclusions as results

Result and Discussion

The Credit System in Indonesia is by the mandate of 12 ayat 1 Undang-Undang Nomor 20 tahun 2003 concerning the National Education System, that every student in each education unit has been able to obtain educational services in accordance with their talents, interests and abilities and completing the education program in accordance with the pace of each study and not deviating from the stipulated deadline. The basis of the credit system is the law of National Education System is the Regulation of The Minister of Education and Culture No. 158 of 2014. The Credit System gives weight to the requirements of grades, levels, or time of academic courses taken at other schools or educational institutions. This Credit System is one of the answers in the service of different students' interests, talents, and speed.

Implementation of Mathematics Learning Semester Credit System

Before implementing the Credit System, the teacher makes a learning device in accordance with the material to be taught. Learning tools consist of syllabus, lesson plans, assessment instruments, and ILAU. Planning begins with the math teacher planning a mapping of Basic Competencies and Core Competencies for six semesters and four semesters. Furthermore, mathematics teachers make lesson plans and syllabus based on mapping of Basic Competencies, Core Competencies for six semesters and four semesters. The syllabus and lesson plans made by the teacher are not much different from the previous curriculum where mathematics learning has not been implemented in Credit Sytem. The mathematics material taught is the same as the material in the education curriculum in the country. While the difference lies in the number of semesters that can be passed, a lot of material is learned every semester, and the length of class between four semester and six semester of Credit Sytem.

The implementation of mathematics learning of Credit Sytem using ILUA is made by each teacher, so there is no standardization in compulsory mathematics and specialization mathematics. This is evident in the difference in one of the ILUA arrangements which makes the mathematics teacher free to change the Basic Competencies structure in first semester of class first grade. The teacher reason is to make the material more structured and systematic so

that it is easily understood by students. For example, it is the function material located in Basic Competencies 3.5 which is the last Basic Competencies in the first semester to be the starting material taught to replace Basic Competencies 3.1 about the absolute similarities and inequalities.

Mathematics learning must be carried out 4 hours in 1 week and specialization mathematics for 3 hours in 1 week, where in 1 hour is 45 minutes. The number of hours is still the same as before learning in Credit System, and is in accordance with the guidelines for implementing Credit System at the high school level. Credit System retrieval in mathematics is still a package system that is tailored to the Core Competencies and Basic Competencies that must be mastered by students and students cannot choose the material according to their wishes. Mathematics learning also still refers to the 2013 Curriculum where learning is to build attitudes, knowledge, and skills, as well as the character of students. But the most prominent thing in learning mathematics in Credit System is that mathematics teachers no longer conduct group discussion processes. This is because teachers still find it difficult to carry out discussions for three types of learners. In addition, mathematics teachers do not assign homework to students because mathematics learning activities must be done at school. Mathematics teachers still apply daily tests as evaluations of learning and remedial for students who have not yet completed, but do not enrich. The Minimum Completeness Criteria used in mathematics learning in the year before the Credit System is 67, but in the Credit System, the criteria become 75. Mathematics teachers also find it difficult to interpret the assessment criteria because last year the value of 78 included Good criteria, but in Credit System the value of 78 is still included in the criteria. Secondary Schools that observers observe have conducted mathematics learning with Credit System for 1.5 years. The number of students in class second grade consisting of 288 students selected more than 30 people to take part in the four semester program, with 13 people remaining until the third semester. The number of students who resigned was because they were not sure that they would finish all Basic Competencies for all subjects that were left no more than 7 months to take the national exam. Whereas for first grade, there is still no data on who students are interested in participating in the four semester program.

Student perspective of mathematics learning in Credit System

The implementation of mathematics learning in Credit System makes students divided into three groups of learners, namely slow learners, normal learners, and fast learners. The division of student types is the implementation of the National Education System is the Regulation of The Minister of Education and

Culture No. 158 of 2014 article 2. That is the implementation of credits that allow students to obtain learning opportunities and achieve optimal levels of ability according to their talents, interests, and abilities/learning speed. The implementation of the Credit System, the teacher is more focused on fast learners because to pursue four semesters and this makes the type of normal learners and slow learner feel less noticed. This type of fast learner does not have a problem because it only confirms the truth of ILAU, but for normal learners and slow learners, the teacher has to pay attention, let alone this normal learner is not too far from the maximum learner value of 75 and the slow learner is less than value 75. Another obstacle is that students become less likely to hold discussions for the same material, because of the speed in working on different ILUA. This is in accordance with his opinion that the slow learner way of learning will be more effective with a conducive learning environment (Ahmad et al., 2015). Sometimes fast learners are not happy and feel annoyed to be asked by other learners because it can hinder the speed of completing their ILUA.

Table 1. Student perspectives on the mathematics learning of the Credit System.

	Result Data Reduction and Data Display	Theme	Inter-Theme Appropriateness
Slow Learner	Students feel unfair with the distribution of learners Students feel pressured by the learning speed of other friends Students do not have learning motivation Students feel that ILUA is too difficult to learn independently Students work on ILUA by looking at the work of students who have finished working on Students are ashamed to ask the teacher	Learning objectives are not meaningful	
Normal learner	Students do not participate in learning because they want to enter the class of fast learners. Learning is boring because every day doing the same routine	The same thing happens in the learning process	Learning can not serve slow, normal and fast learners
Fast Learner	Students rush into completing ILUA During third semester, students begin to be unsure of being able to pass 4 semesters because there are still many unfinished material Students work on ILUA outside of learning Students must wait for slow learning students and normal student learners for daily tests Students become less likely to communicate with slow learning students		

In the early days of Credit System implementation, mathematics teachers map seats based on homogeneous types of learners, meaning slow learners are united with slow learners, normal learners are united with normal learners, and fast learners are united with fast learners. This makes students from slow learners feel discriminated because they are considered as slow learners. In addition they assume that there will be capitalism events where the smart will be smarter while the slow ones will be slower due to the homogeneous grouping. The desire of fast learners to immediately complete ILUA makes students not enjoy learning. They continued to ask ILUA later for the mathematics teacher. Whereas for slow learners they can copy work from normal learners or quick learners to immediately finish ILUA. The ILUA settlement rules are all done in the classroom, but the rules are often violated by students because many students are working on ILUA at home especially the teacher does not memorize until what page each student finishes when learning takes place.

Teachers perspective of mathematics learning in Credit System

Teachers still have difficulties in facilitating three types of groups learner, namely fast learners, normal learners, and slow learners. So that for the beginning of the semester the teacher has not shared the type of learner and still uses the Curriculum 2013 learning like last year. After the teacher carried out the first daily test, the teacher tried to divide the three types of learners based on the results of the first daily test, but in practice the teacher still had difficulties in managing and facilitating the three types of learners, where the teacher's attention prioritized the learning group slowly at the beginning but in the following month the teacher focus more on fast learners to immediately complete 4 semesters. This gives rise to social jealousy from slow learners especially normal learners who are midway between fast and slow. Teachers have difficulty identifying types of slow learners, normal learners, and fast learners who always change each Basic Competencies. The ILUA which is used as a learning unit, loads the full learning of each subject by students in accordance with the learning speed of each that is not yet available from the government, making the teacher must immediately make it independently according to his understanding, while there are fast learners who have completed ILUA but for ILUA the teacher has not yet been provided.

Table 2. The teacher's prespective of the mathematics learning in Credit System

Result Data Reduction and Data Display	Theme	Inter-Theme Appropriateness
Slow Learner	Students feel unfair with the distribution of learners Students feel pressured by the learning speed of other friends Students do not have learning motivation Students feel that ILUA is too difficult to learn independently Students work on ILUA by looking at the work of students who have finished working on Students are ashamed to ask the teacher	Learning objectives are not meaningful
Normal learner	Students do not participate in learning because they want to enter the class of fast learners. Learning is boring because every day doing the same routine	The same thing happens in the learning process
Fast Learner	<u>Students rush into completing ILUA</u> During third semester, students begin to be unsure of being able to pass 4 semesters because there are still many unfinished material Students work on ILUA outside of learning Students must wait for slow learning students and normal student learners for daily tests Students become less likely to communicate with slow learning students	Learning can not serve slow, normal and fast learners

Teachers find it difficult to use same learning media, because the speed of students in working on ILUA is different, impressed the teacher repeating the use of learning media. This will also cause disruption to learners who have not reached the material and learners who have reached the material. In addition, ILUA content is still found typographical errors by the teacher, so that students experience confusion in understanding ILUA that is required to be done independently. Students who are busy working on each ILUA, make improvements that have been submitted by the teacher again asked by other students and it makes the teacher have to repeat the justification. The interests, talents, and speed of different students make each student's daily test different from time to time even though the daily test is a mandatory requirement so

that students can continue to ILUA in the next Basic Competencies. This causes the teacher to provide questions on different daily tests and increase teacher work because they have to make various types of daily test questions. So that in the implementation the teacher waits for all groups of learners to complete the ILUA with the same Basic Competencies to be repeated with the same day and the same questions. Another reason is secondary schools that researchers carefully use Computer-Based Daily Tests so that teachers will have difficulties in place, time, and energy that will be used if daily tests are not carried out simultaneously.

Whereas for students who have passed ILUA continue to ILUA even though they have not had a daily test to wait for all study groups to complete ILUA so that they can do the same test. Grouping types of learners for each subject is different, so seating arrangements will also be different for each subject. This will lead to reduced learning time to arrange seating so that students remain heterogeneous. Many students have not completed the Basic Competencies that must be met at the end of the semester, so the teacher cannot continue to classify the types of students. Teachers also have difficulty developing students' HOTS because it use constructivism, providing opportunities for students to explore abilities, and solve problems (Retnawati et al, [2018](#)), which makes students fixated on solving ILUA.

Strategies in the implementation of mathematics learning in Credit System

Based on the analysis of the obstacle of the implementation of mathematics learning from the viewpoint of students, teachers, and researcher have a view on the learning strategies of mathematics in high schools that implement the Credit System as follows.

Instructional Toolkit

Instructional toolkit consisting of syllabus, lesson plans, assessment instruments, and ILUA, were made by all math teachers. The first step is that all mathematics teacher work together to create syllabus based on mapping 4 semesters and 6 semesters. Then Basic Competency is divided into lesson plan, assessment instruments, and ILUA. After all devices are finished, all the teachers discuss to perfect each lesson plan, assessment instrument, and ILUA to reduce misconceptions and typos. After that all the tools that have been made by each teacher are evaluated to be put together and the results of the unification of the devices are used for learning in each class. Each teacher makes at least 5 types of questions for each Basic Competence, in order to have more variety of questions.

Grouping of Learners

The government has provided examples of sitting position descriptions for teachers, fast learners, slow learners, and normal learners. However, the teacher is still having difficulties so that the strategy that can be done by the teacher is before the students are grouped for ILUA in the first Basic Competencies the teacher has the data of junior high school National Examination. The National Examination data is used by the teacher to determine the grouping of learners. Whereas for ILUA in the second Basic Competencies, third, and so on based on the results of the previous daily review. The sitting position that will certainly change in each subject does require the time for students to position their seats, this can be overcome with a maximum of one day before the learning takes place the teacher tells the chair of the sitting position class they will do in class. So that after hours of other subjects have been completed, students can immediately place a sitting position that is in accordance with the learning of mathematics. Another obstacle experienced by the teacher is having difficulties in identifying students who are fast, slow, and normal learners who are different in each Basic Competencies. So in overcoming this, students use colored identity cards. For example, for slow learners using red, normal learners use yellow cards, and fast learners use green cards.

Independent Learning Activity Unit (ILUA)

The ILUA content provided really makes students work independently, ranging from apperception, motivation, goals, learning steps so that teachers do not have time to explain the same things with different types of learners if ILUA is easy to understand. The teacher can provide clear and detailed steps for using media at ILUA so that students can try it for themselves. The teacher can also write links such as videos that can be accessed so that students learn mathematics more easily. In addition, teachers pay more attention to content in ILUA so that typographical errors cannot be found that can confuse students and make it difficult for teachers because they have to make improvements. Moreover, teachers have an important role in students' understanding of mathematics (Francisco et al., [2021](#)). Especially in mathematics learning, the use of symbols and the use of numbers greatly influences students' understanding. This can also be supported by the provision of facilities and training for teachers (Arvinder Kaur & Manju Sharma, [2016](#))

Learning process

After the preparation of learning equipment, learning group division, and ILUA justification, the most important thing is the process of learning

mathematics. The following the authors convey the learning process that can be used as an improvement of the mathematics learning process that has taken place.

- 1) Teachers and students position themselves in class in accordance with government regulations, students have also used the color card identity that the previous author has submitted.
- 2) In order for cooperative learning to continue to be implemented, the authors suggest that at the first ILUA the first meeting, students are divided into several discussion groups with heterogeneous (mixing between fast learners, slow learners, and normal learners). For example, pages 1 to 5 are done in groups and discuss according to the models used by teachers such as discovery learning, problem based learning, etc. Whereas for page 6 and so on can be done to work independently for the next meeting. Mathematics materials in Indonesia can combine student experience with mathematics (Alberto et al., [2022](#)). Whereas for ILUA in different Basic Competencies, so that the cooperative learning process continues to occur, then in which ILUA commands are given which parts should be carried out in groups, then students find friends in the class who will work on ILUA in the group work section.
- 3) In doing scaffolding the teacher can act fairly while still paying attention to the progress of each student by means of slow learners being the top priority, because they still need attention. As for normal learners, teachers can apply peer tutors between normal learners and fast learners. This can be an initial confirmation activity before the normal learner gets the attention of the teacher.
- 4) Student involvement in completing ILUA can be monitored using the ILUA Progress Card, which contains Basic Competencies tables, pages that have been reached, and implementation dates. This will be a solution for students who cheat by working on ILUA at home. This card will be filled with students 5 minutes before learning is complete to be collected to the teacher.
- 5) Fast learners can be given additional study time outside of class hours and are allowed to work on the ILUA at home.

In addition to the steps previously mentioned, other things discussed were consultations for students in choosing subjects and optimizing resources in designing curriculum (Phadnis, [2019](#); Hasan, [2015](#)). Students can freely determine the material to be taken, in this way more students are likely to succeed in applying the credit system (Shivasakthy et al., [2016](#); Scholar, [2015](#); Prajapati, [2014](#)).

Conclusion

The implementation of mathematics learning in Credit System is still far from expectations. Both students and teachers still experience difficulties in carrying out mathematics learning on the Credit System. Slow learners and normal learners feel less noticed because the teacher is more focused on fast learners to pursue four semesters. The teacher also admitted having difficulties to facilitate all types of learners especially every learner has a different speed. In overcoming this problem all mathematics teacher can work together to create a ILUA that can be used for all classes. The teacher provides a learning video link to facilitate differences in the speed of the teacher's students making modules that are easily understood by all types of students, and adds hours of learning to fast learners, this is to complete Basic Competencies before graduation.

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