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21st CENTURY TEACHING AND LEARNING: STUDENT TEACHER'S PERCEPTIONS AND CHALLENGES IN HIGHER EDUCATION INSTITUTIONS

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Abstrak

As information technology rapidly changes workplaces and classrooms, the need for education has shifted from focusing on static skills to the ability to learn in a dynamic environment. Higher education institutions are looking for teaching practices to bridge performance gaps and meet the challenge of ensuring that students are prepared for careers after graduation. During this pandemic, more than 85% of jobs are computer-oriented, but a small percentage of students seek educated qualifications. The skills of the early twentieth century are essential to prepare students for these tasks. The purpose of this research is to determine a consensus on the composition of 21st century skills, measure the views of students and teachers, and determine the challenges students face in the learning process. This was a mix methods study. A perceptual survey accompanied by open-ended questions deepened analysis and understanding. The data was analyzed descriptively and open ended question responses were coded, categorized and analyzed using qualitative data analysis approach. The findings showed student's the difficulties in developing 21st Century skills.

Key words: *21st Century Skills, Student Teacher's Perceptions, Higher Education*.

INTRODUCTION

Many high-paying, highly skilled occupations available to students in the 21st century depend to a large extent on reading, writing, and computational math. These careers require critical thinking and problem-solving skills, as well as collaboration, communication, and creativity integrated with technology (Partnership 2006). Griffin and Care (2015) reported that university graduate students are not yet ready for employment in the digital age. Some students have a high GPA, but when they enter the workplace, they still need to learn more. This shows that students need to focus on 21st century skills to meet the requirements of the workplace. Higher education institutions have a responsibility to ensure that the teaching and learning provided within the institution equip students with 21st century skills such as critical thinking, problem solving, decision-making and collaboration skills. Educators need to find out whether students

have these skills. In other words, the students need more than just a theory, they should train to solve real world problem that will be faced in the workplace.

In this regard, the Indonesian government imposed a curriculum in 2013 whose main focus is to develop 21st century skills which include character qualities, competencies, and basic literacy. This policy was taken by the government based on the results of the PISA and TIMSS studies where Indonesian students' performance were below the average score. In addition, to help students develop these 21st century skills, teachers must have good perceptions and knowledge of 21st century skills themselves.

The Indonesian government has launched a 2013 curriculum that is oriented towards developing the skills of the 21st century of the students (Kembdikbud, 2016). The purpose of this curriculum reform is to change the old learning style that is solely teacher-centered into student-centered learning, where teachers are asked to use learning models such as problem-based, project-based learning, discretionary learning and cooperative learning (Fajri et al., 2020; Fajri et al., 2020; Yusuf et al., 2019). However, in the reality it is found that teachers are more dominant in the learning process and students cannot learn without being directed by the teacher. Reform only appears in the lesson plans by bringing up these learning models but the implementation of learning is still the same as conventional approach. Therefore, it is very important to understand the perceptions and knowledge of teacher educators and prospective mathematics educators towards 21st century skills-based learning.

Perception and knowledge of prospective teachers is one of the crucial factors needed in facilitating students to learn to develop 21st century skills (Abbot, 2007, Partnership for 21st Century Skill [P21], 2009, Gouyuan, Chai, Liang and Dong, 2018) because teachers are key agents in every education reform. The teacher education colloge as a teacher producing institution must be sensitive to the reform policies taken by the government, so that the graduates produced have competencies that are relevant to the real conditions of work place. Teacher educators in education university are also required to keep updating pedagogical trends and government policies, especially the one that related to skills development in the 21st century (Fajri, 2019). Therefore, it is very necessary to find out whether teacher educators support 21st century skills-based learning as demanded by the current global market or not. In addition, it is also necessary to know the gap between the ideal expectations of the application of 21st century skills-based learning and the reality in the field today. Developing valid and reliable instruments and actual surveys of these

gaps can be a form of needs analysis for policy makers, especially the ministry of education and culture, education university board and lecturers to formulate policies and design curricula that are relevant to future needs. This study aims to contribute to the current interest in 21st century skills-based learning that is currently being focused on in Indonesia.

The purpose of this research was to know the student's perception of their 21st Century skills development, experienced teaching and learning process which enable them to enhance 21st Century skills and the challenges faced in acquisition of 21st Century skills.

METHOD

Reseach Approach

The purpose of this study was to investigate the perceptions of student teacher candidates in several education universities in Indonesia towards 21st century-based learning and daily practices. For this purpose, this study uses a survey method in order to find out the perceptions of prospective teachers about 21st century skills and the learning experiences of prospective teachers that lead to 21st century learning. Perception surveys are given to respondents in each institution to measure perceptions of learning experiences felt by their students.

Time and Research Location

The research was carried out during the COVID-19 pandemic which took place from March to October 2020 using an online survey using google form which was distributed in several teacher education schools in Indonesia.

Population and Sample

Prospective mathematics teachers who were studying in teacher education colleges throughout Indonesia were involved in this study. Using a convineint sampling technique, they were asked to participate to fill the survey. Based on the sampling technique, the sample involved in this study were 77 students from 8 education universities in Indonesia.

Data, Instrument, and Data Collection Techniq

Data were collected through questionnaires distributed online. The questions in the questionnaire developed based on 6 scales or factors that will measure respondents'

perceptions regarding 21st century skills which were adapted from previous research by Rise (2017). The questionnaire will be compiled in 2 versions, one version to assess teacher educators' perceptions of 21st century skills and the other to find out the learning experience of prospective teachers based on 21st century skills. The 6 factors measured in the questionnaire are as follows:

1. Critical Thinking and Problem Solving. This aspect will measure the support of lecturers for the development of students' critical thinking skills and authentic problem solving abilities of students in the classroom
2. Creativity and Innovation. This aspect will measure the support of lecturers for the development of students' creative thinking and innovation skills in the classroom.
3. Communication. This aspect will measure the support of lecturers in developing student communication skills.
4. Collaboration. This aspect will measure the support of lecturers for student collaborative learning in the classroom.
5. Use of ICT. This aspect will measure lecturer support for the use of ICT by students in the classroom.

The questions in the questionnaire use a scale 1 (almost never), 2 (a few times a semester, 3 (1-3 times per month), 4 (1-3 times per week) and 5 (almost daily). The perception survey was used to analyze the level of student perceptions of learning practices that lead to the development of 21st century skills. This study used the twenty-first Century Teaching and Learning Survey adopted from Rice (2018) which has been tested for reliability with alpha >0.90 and instrument validity of >0.58. Participants were also asked to fill in demographic data for analysis purposes as well as several open-ended questions regarding supporting facilities and the obstacles they face in the day-to-day learning process.

Data Analysis

This study uses two data comprises of quantitative data obtained from the results of measuring student perceptions and qualitative data obtained from open-ended questions from a survey regarding the constraints faced by students in learning to develop their 21st century skills. Quantitative data were analyzed descriptively using SPSS version 20, data

obtained from the responses given to the open-ended questions were categorized into themes by using qualitative analysis procedures.

RESULTS AND DISCUSSION

Demographics of Sample

Demographics data of prospective mathematics teacher involved in this study can be seen in the following Table 2.

Table 2. Demographics of Sample

No	Variables	Percentage
I. University		
1	IAIN Zawiyah Cot Kala Langsa	13
2	STKIP BBG	9.1
3	UIN Ar-Raniry	13
4	Universitas Ahmad Dahlan	27.3
5	Universitas Jenderal Sudirman	2.6
6	Universitas Malikussaleh	31.2
7	Universitas Muhammadiyah Pare-pare	2.6
8	Universitas Sarjanawiyata Yogyakarta	1.3
II Type of University		
1	Public University	59.7
2	Private University	40.3
III. Gender		
1	Male	19.5
2	Female	80.5
IV. Semester of study		
1	Semester 1	33.8
2	Semester 2	6.5
3	Semester 3	18.2
4	Semester 4	6.5
5	Semester 5	10.4
6	Semester 6	1.3
7	Semester 7	16.9
8	Semester 8	3.9
9	Semester 11	1.3
10	Graduate	1.3

Instruction practices conducted by lecturers in directing students to develop 21st century skills.

Survey data of teaching practice experienced by students which develop their 21st century skills can be describe in the following section

1. **Critical Thingking and Problem Solving**

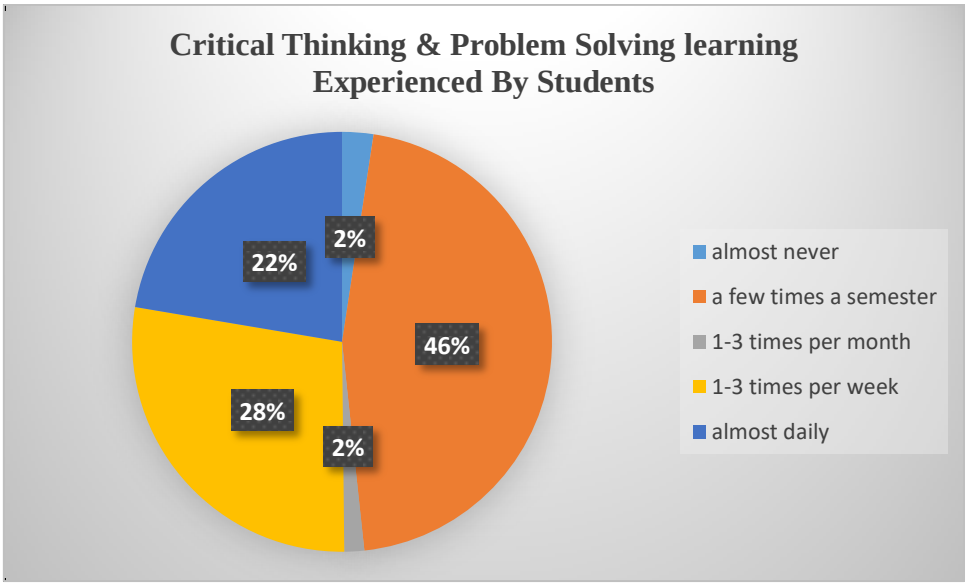

Figure 1. Critical Thinking & Problem Solving Learning Experienced by Students

It can be seen from the above graph that the learning activities facilitating students' critical thingking and problem solving skill development were barely implemented in daily teaching practices by lecturer. 46% of students said that the leacturer implemented them just a few time a semester. Only 2% of students experienced it almost every day.

2. **Creativity and Innovation**

Related to the implementation of learning activities which lead students to develop creativity and innovation skill, 46% of students also convey that their lecturer just conducted it a few times a semester, even 2% of the students never experienced learning process which help them to acquire creativity and innovation skill. While other categories for detail can be seen in the Figure 2.

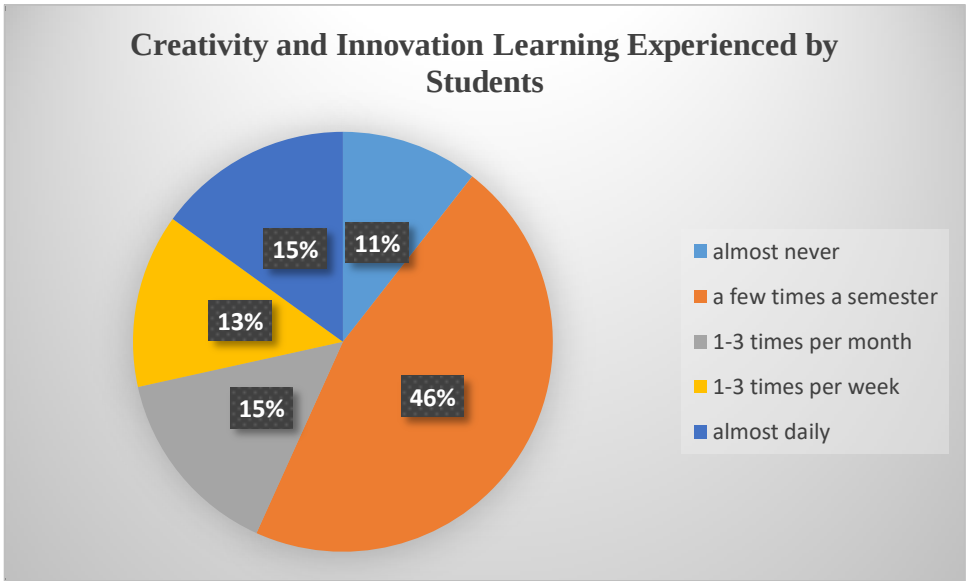

Figure 2. Creativity and Innovation Learning Experienced by Students

3. Collaboration

Data analysis related to student perception toward collaboration is presented in the Figure 3.

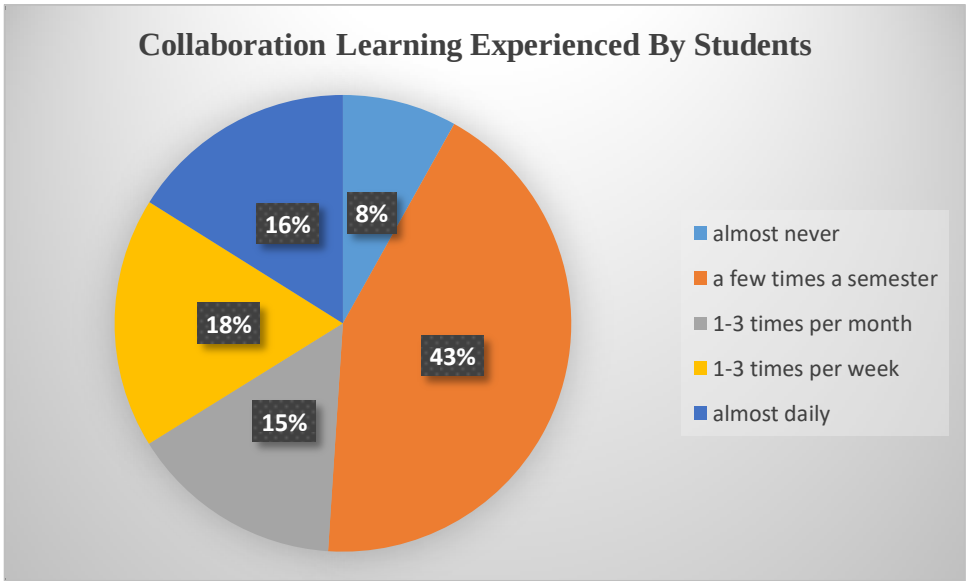

Figure 3. Collaboration Learning Experienced By Students

It can be seen that the implementation of learning activities which supporting student learning to develop their collaboration also quite rare. 47% students reported that it was conducted a few times a semester, 8% students never experienced those learning activities. Only 16% students engage in the learning process which improve their collaboration skill.

4. Communication

Data analysis related to students' perception towatd communication skill (Figure 4) also reveal that 8% students never experienced learning which trained them to build communication skill, and 47% experienced it a few time a semester. In contrary, only 13% admitted that the lecturer use to conduct learning activities helping them to maintain communication skill.

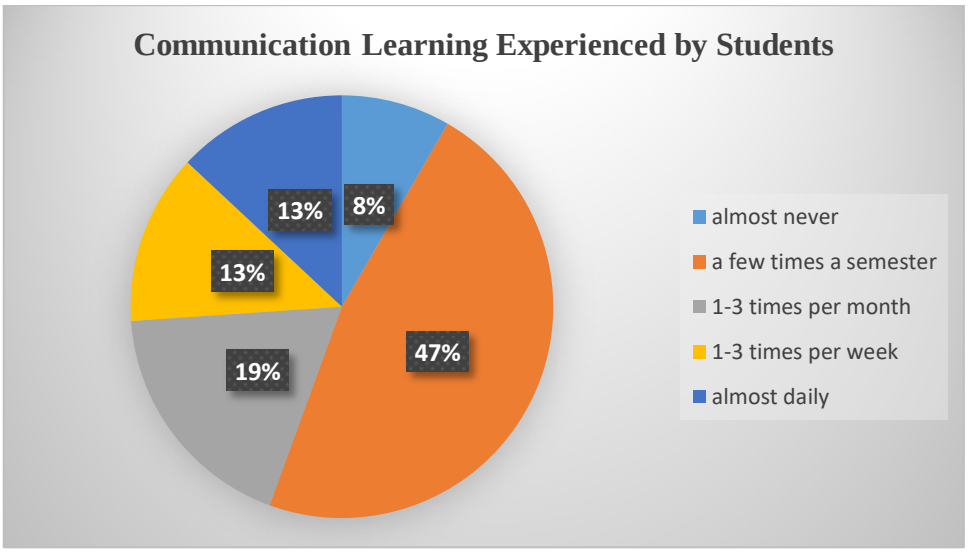

Figure 4. Communication Learning Experienced by Students

5. Technology as a Tool of Leaning

Related to the implementation of learning activities which lead students to develop technology, the result as can be seen in the Figure 5, show that 35% of students also reported that their lecturer uses technology almost daily, only 5% students never experienced learning process which help them to development technology skill.

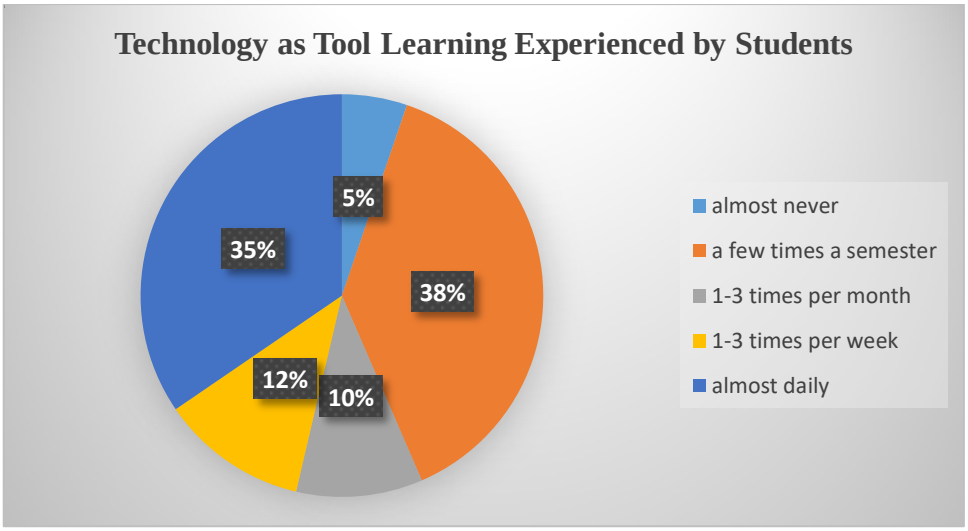

Figure 5. Technology as Tool Learning Experienced by Students

Students' Obtacles in Learning 21st Century Skills

Information related to students' challenge in learning 21st century skills gathered from open ended quisionner were analyzed following the qualitative analysis procedures comprised read the data carefully, find the theme based on data, categorize the data into the themes, and draw conclusion. The results can be described as follow.

No	Theme	Findings
1	Resource and support system	• Lack of books or other reading materials related to 21st century skill • lack of ICT facilities (internet access and quota/balance) • learning environment does not support • low internet access made difficult to communicate among student
2	Abilities	• critical thinking and problem solving difficult to learn • lack of literacy skills • not used to learn using instruction based 21st century skills
3	Hectic, confident	• student easy to get tired • lack of confident to solve problem or create innovation and to communicate with others
4	Online Learning	• Difficult to comprehend the course material because online learning during pandemic • Instruction process just focus on dilevering content and submitting tasks, no interaction among students
5	Instruction process	• Students were barely asked to solve problem and think critically • The way of delivering course • Difficut to understand what lecturer said • Being one group with peer who are not familiar with ICT
6	Time	• Learning 21st Century skill consume more time

Discussion

Based on the results of data analysis, it was found that the majority of students were familiar with 21st century skills. They also agreed that prospective teachers should understand the concept well. However, the level of implementation of the learning process that leads to the development of 21st century skills is still low. This can be seen from the

percentage and average perceptions of students ranging from 2-3 which are included in the category of several times a semester to 1-3 times a month. This shows that the frequency of implementing learning that leads to the development of these skills is still low.

Learning practices that lead to the development of communication, collaboration, critical thinking and problem solving, creativity and innovation skills are rarely implemented. It can be seen from the percentage of almost never and a few time a semester which quite higher compare to other categories for eash skill measurement. Based on the result of qualitative data analysis, it is found that the least implementation of these skills because lecturer and students not used to these skills. Designing and implementing instruction based on the skills is not an easy task (Fitriati, Novita & Johar, 2020; Fitriati, Marlaini & Elizar, 2021). Meanwhile, the skills in using technology were classified as high, where the number of student who agree that it was implemented almost every day reach 35%. This affected by pandemic Covid-19 where all the instruction were conducted using ICT.

This finding contradicts the demands of mathematics learning, especially teachers today, where skills-based learning practices in the 21st century should be very intense so that students will develop their skills as the result they can become professional and tough teachers in facing the challenges of the world of education in the future. The low teaching practice that is skill-oriented will have an effect on the low understanding and teaching practices of prospective teachers for students in Indonesia in the future.

Conclusion

Overall, the prospective mathematics teacher's perceptions of 21st century skills and learning practices are in the moderate category. In the aspects of physics and the needs of students, generally they already know and state that they are necessary, but in the specific aspects of practice each skill is still low. Learning practices that lead to the development of critical thinking skills and problem solving and creativity and innovation, communication and collaboration skills are rarely implemented. While the skills to use technology are classified as high. Among the bariers that student faces in the 21st century teaching and learning mostly because the skills were difficult to learn and it was barely implemented in daily classroom, lack or learning sources and ICT facilities to support student learning, and instructional related problems such as lecturer ability in deleviring course and group work setting.

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