21st Century Learning and Its Application to The Independent Curriculum

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Abstract. Education always experiences development and progress due to the influence of several factors. One of the most influential factors is the factor of technological progress. The contact of technology with the world of education at this time makes humans have to prepare to face 21st century learning. So it is necessary to implement 21st century learning into the education curriculum. In Indonesia itself, the curriculum that is currently being implemented is the independent curriculum. The purpose of this research is to find out the form and method of implementing 21st century learning in the independent curriculum. This research uses quantitative research methods with survey models and Rasch model analysis. The results obtained in this study are that the independent curriculum strongly supports the application of 21st century education. The application of 21st century education in the independent curriculum can be seen from the development of students' potential talents and interests as well as students' ability to use technology in the learning process. 21st century learning will continue to be applied and developed in the independent curriculum. The limitation of this research is that it only examines the application of 21st century learning in the independent curriculum. Therefore, the researcher hopes that future researchers can conduct similar research on other curriculum developments.

Keywords: Application, Independent Curriculum, 21st Century Learning

1   Introduction

Human life runs continuously. Humans in their lives need various supports and complements to be able to fulfill their life needs. Because human life continues to run and the times are also advancing, that's why humans need something that can help them survive the times [1], [2]. One of the things that can help humans is technology. Technology has a very important role for humans in order to upgrade and develop their lives for the better.

Technology is something that cannot be separated from human life. Technology is a knowledge created to facilitate human life. Scientists do various ways to be able to create something new and can be used easily [3]. The work of scientists is continuous

ly developed by scientists afterwards so as to create and produce something more creative and innovative to make a job more effective and efficient. Technology has an impact on various important aspects of human life. One of these important aspects is education.

Education is a process or activity in which there is a process of transmitting knowledge along with important values from an educator to his students [4]. Education that has been influenced by technological advances and developments will make education also develop according to the development of technology. The combination and cooperation between education and technology will make learning different from previous learning activities. Learning that has been touched by technology will be more developed and has more potential to produce quality students. Learning at this time becomes more modern learning known as 21st century learning.

21st century learning is learning that emphasizes the literacy of students, good and precise knowledge, skills possessed by students, students' personal character along with students' proficiency in using technology [5],[6]. This learning is a more modern type of learning than other learning. In this learning, students and teachers are both required to be able and skilled in using technology.

This technological skill is the most important factor to be able to follow 21st century learning [7], [8]. Because for 21st century learning, it is certain that it will not be able to escape the name of the technology. However, in fact, there are still many teachers, lecturers and students who are not technology literate. This is certainly a barrier in the implementation of 21st century learning. Therefore, to be able to implement 21st century learning properly, it must be supported by the most important thing that becomes the learning design, namely the curriculum.

The curriculum is a device that contains designs related to the implementation of education. This curriculum can be said to be a plan prepared as a reference in the education process [9]. In making and determining a curriculum, of course, pay attention to various important factors related to education, namely educational goals. If in the application of a curriculum these educational goals have not been achieved, it is necessary to develop the curriculum.

Curriculum development is an effort or activity carried out to develop the education curriculum more optimally so that educational goals can be achieved [10] [11]. The curriculum needs to be developed so that education can run more effectively and efficiently. This curriculum development is carried out so that the curriculum can meet the demands of society and the demands of the times. As an important part of the world of education, the curriculum must be close to the community. This means that the curriculum must be in accordance with the needs and desires of the community. In Indonesia, development occurred several times until the implementation of the independent curriculum at this time.

The independent curriculum is a curriculum that is filled with various kinds of intracurricular learning where the content or content in learning is optimized so that students have sufficient time to be able to understand concepts and their self-competence will be more improved and stronger [12]. In this independent curriculum, learning can be tailored to the needs and interests of students because teachers are given the freedom to choose from various teaching materials or devices that have

been provided. In this independent curriculum, learning is provided in the form of certain themes that are developed to achieve the Pancasila learner profile. Projects in learning are not directed to achieve specific goals or objectives so they are not tied to learning content [13]. To be able to achieve learning objectives, the implementation of this independent curriculum must be able to support learning that is currently developing, namely 21st century learning.

The Merdeka Curriculum has indeed become a curriculum that is applied to the national education system in Indonesia at this time. Actually, the Merdeka curriculum is not a curriculum that was implemented in 2023. However, the Merdeka curriculum has been applied to the world of Indonesian education since the running or enactment of distance learning caused by the spread of covid-19. However, the implementation of the Merdeka curriculum is still not fully implemented and implemented in every education unit as a whole. The pros and cons of implementing the Merdeka curriculum are still a very hot topic of discussion in the world of Indonesian education. Many educators still do not fully accept and understand the changes in the 2013 curriculum to the Merdeka curriculum. Likewise, among students, there are those who think that the implementation of the 2013 curriculum is still not fully understood so that students are not too open to the existence of this Merdeka curriculum. Moreover, with the active use of technology in the Merdeka curriculum, educators and students who are not technologically literate are increasingly confused in learning. All of these phenomena certainly need more attention from the government so that the implementation of the Merdeka curriculum can truly be realized and well received by educators and students.

21st century learning is becoming very popular in the world of education at this time. As for the independent curriculum itself is a curriculum that is being implemented in the education system in Indonesia and is much discussed at this time. In order for 21st century learning to run well and improve the quality of education in Indonesia, 21st century learning must be applied to the independent curriculum as the curriculum being implemented in this country. With this, it is hoped that education in Indonesia will be of higher quality and able to be equal to education in developed countries and other developing countries.

This research aims to find out the application of 21st century learning in the independent curriculum. 21st century learning is very important in the world of education. With the independent curriculum, it is hoped that 21st century learning will truly be able to become learning that can improve education in Indonesia. The independent curriculum is a very appropriate tool to be able to make 21st century learning more focused and more positively developed. Therefore, it is necessary to have the right application of 21st century learning in the independent curriculum that is being used at this time.

2   Methods

This research uses quantitative research methods with rasch model analysis. Rasch model analysis is used by conducting a survey first. Rasch model analysis is used

because it is in line with the research objectives, namely to find out 21st century learning and its application to the independent curriculum. Meanwhile, a survey was conducted to collect data or student opinions regarding the application of 21st century learning in the independent curriculum. This research was conducted at one of the Islamic universities in West Sumatra. The university is Mahmud Yunus State Islamic University Batusangkar. This research was conducted during even semester lectures in 2023 because the independent curriculum has been implemented at the university.

The results obtained in this study are from a survey that has been conducted previously on students of Mahmud Yunus Batusangkar State Islamic University. This survey technique was carried out by distributing questionnaires that had been made on the previous google form. After this questionnaire was distributed, the last data was obtained that this questionnaire had been filled in by 20 students. The questions given through this questionnaire are considered to be very clear and can be understood well by the sources. The answers that have been obtained from the sources have also been recorded and obtained clear results as well.

The data obtained from this study used a survey technique that had been carried out by previous researchers. Initially, researchers made a questionnaire on google form which was then distributed to three Islamic universities. The answers given by the sources or students were automatically recorded. The data obtained in the questionnaire is then presented using Rasch model analysis. Rasch model is a tool that can test the validity and reliability that displays the consistency of a series of measurements or measuring instruments used in research through analysis techniques [13]. With this Rasch model, data in the form of raw numbers or values can be presented into data that has the same distance or interval so that the measurement scale obtained is placed on a straight line and has a level of accuracy that can be tested and automatically assigned units. Rasch model analysis means analyzing the existing Rasch to provide details on each value or result obtained [14]. To be able to present the results of this rasch model analysis, researchers use the ministep application. This application can move raw data from surveys through questionnaires filled out by previous sources into the Rasch model.

3   Results and Discussion

Instructions regarding the reliability and validity of items and respondents will be seen in the analysis of the data that has been generated which is divided into several statistical summaries. The following results of the analysis on items to see the suitability between dimensions and statements can be displayed in table 1.

Table 1. Results of item analysis of congruence between dimensions and statements (validity test)

	Eigenvalue	Observed	Expected
Total raw variance in observations	52.6608	100.0%	100.0%
Raw variance explained by measures	42.6608	81.0%	80.6%
Raw variance explained by persons	33.3569	63.3%	63.0%

Raw Variance explained by items	9.3039	17.7%	17.6%
Raw unexplained variance (total)	10.0000	19.0% 100.0%	19.4%
Unexplned variance in 1st contrast	2.7503	5.2% 27.5%	
Unexplned variance in 2nd contrast	1.9646	3.7% 19.6%	
Unexplned variance in 3rd contrast	1.6412	3.1% 16.4%	
Unexplned variance in 4th contrast	1.2113	2.3% 12.1%	
Unexplned variance in 5th contrast	.8640	1.6% 8.6%	

From the data in the table above, it can be seen that the raw variance explained by measures is 81.0%, which means that the items or statements that have been made can be used to measure 21st century learning and its application to the independent curriculum. Meanwhile, the unexplained variance in ist contrast is 5.2%, which means that the instrument that has been made is right to use to measure.

The measurements for each item and its respondents can be seen in table 2.

Table 2. Item Statistic: Measurement of each item and respondent

ENTRY NUMBER	TOTAL SCORE	TOTAL COUNT	JMLE MEASURE	MODEL S.E.	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD	PTMEASUR-AL CORR.	PTMEASUR-AL EXP.	EXACT MATCH OBS%	EXACT MATCH EXP%	ITEM
8	70	20	.45	.38	1.85	1.70	1.59	1.20	.83	.89	43.8	66.7	P8
3	71	20	.30	.39	.78	-.38	.64	-.71	.91	.89	68.8	67.3	P3
2	72	20	.15	.40	.61	-.84	.48	-1.22	.90	.89	81.3	68.1	P2
10	72	20	.15	.40	1.17	.51	1.06	.29	.90	.89	62.5	68.1	P10
1	73	20	-.01	.40	.50	-1.18	.55	-1.02	.90	.89	68.8	66.8	P1
6	73	20	-.01	.40	1.14	.44	1.34	.82	.89	.89	62.5	66.8	P6
9	73	20	-.01	.40	.74	-.47	1.09	Ī.35	.90	.89	68.8	66.8	P9
4	75	20	-.34	.41	1.10	.38	.67	-.67	.88	.88	81.3	65.1	P4
5	75	20	-.34	.41	.86	-.18	.88	-.12	.90	.88	62.5	65.1	P5
7	75	20	-.34	.41	.91	-.07	.95	.03	.87	.88	62.5	65.1	P7
MEAN	72.9	20.0	.00	.40	.97	.0	.93	-.1			66.3	66.6	
P.SD	1.6	.0	.26	.01	.36	.8	.34	.8			10.2	1.1	

Infit MNSQ in the table above shows that statement or item number 8 is invalid because it is in the range above 1.5. Meanwhile, the ZSTD outfit section shows that all items are valid and suitable for use because they are in the range of -2.0 to 2.0. And finally in the section on PTMEASUR-AL CORR it was found that all items were valid and suitable for use to measure. So, it can be concluded that all items are valid items used to measure.

The results obtained from the survey that have been conducted state that most of the respondents agree with the statements given by the researcher regarding the application of 21st century learning in the independent curriculum. So it can be concluded that the independent curriculum supports 21st century learning with the application of 21st century learning in this independent curriculum. The data analysis that has been carried out on items and respondents also shows that the statements or items that have been made by researchers are valid or appropriate to be used to measure in this study.

21st century learning is learning that emphasizes the ability of students to master the world of literacy, have broad knowledge, have good skills and character and be able to use technology [15], [16]. Because 21st century learning requires students to be able to have all of that, then in its application teachers or educators must first be able and have advantages in these aspects. If the educator already has the ability, it will be easier for the educator to transfer all of these things to students so that the educational objectives in 21st century learning can be achieved. Therefore, it needs proper application in the world of education so that 21st century learning becomes more effective and efficient.

The application of 21st century learning in the world of education needs to look at the ongoing education curriculum [17]. So, in the education system in Indonesia, 21st century learning can be applied to the independent curriculum as an ongoing and developing curriculum at this time. In the independent curriculum, there are a series of educational activities that are oriented towards the abilities and talents and interests of students. Here all forms of teaching materials and materials used in education must be in accordance with the talents and interests of these students. The purpose of this independent curriculum is so that education in Indonesia is of higher quality and can answer the demands of society and the demands of the times [18]. This demand wants humans to be experts and skilled in using all forms of technology that have developed, especially in the world of education.

The positive impact that will be seen with the implementation of 21st century learning in the education system in Indonesia is certainly very much. With 21st century learning, educators and students can be more developed than before. In 21st century learning, educators and students are required to be able to master the world of literacy and technology. Therefore, educators and students have the opportunity to be able to upgrade their knowledge even more with training and seminars that are directly guided by experts. In addition, the implementation of 21st century learning will make everyone involved in education more technologically literate and open to the times. The existence of AI which is currently growing rapidly can be an aid for educators and students to be able to find information easily.

Of course, 21st century learning is also feared to have a negative impact on the world of education. One form of negative impact is that with the development of AI today, it is feared that it will make humans lazy to think critically and only rely on the ability of AI technology in everything. This of course will be bad for the development of human civilization. If this happens and is left unchecked, then it is possible that technology can replace the existence and function of humans on earth. In addition, if 21st century learning is not followed by an increase in religious knowledge, then humans will lose noble manners and morals. It could be that humans are too focused on playing technology so that they forget the good values that have developed in society.

All things that are determined or occur are of course expected to have a positive impact. However, it does not rule out the possibility that negative impacts may occur. So regardless of the positive and negative impacts of 21st century learning, the government, educators and students must be able to take all the good things from 21st century learning. Humans must fortify themselves with faith and devotion, critical thinking and also knowledge that is continuously upgraded so as not to drown in this

rapid technological progress. It must be understood that this technology exists not to replace the role of humans, but this technology exists to help humans and to become a reference for humans to continue to develop.

The role and participation of technology in educational activities at this time is very large and has even changed many things in the national education system. Starting from learning methods, learning media along with learning objectives that began to be revised and developed in order to continue to improve the quality of education itself [19]. For 21st century learning, all forms of technology are directed and expected to improve education. The government is trying hard so that this growing technology can be utilized and taken as a positive impact in the world of education. Therefore, in the current independent curriculum, many things related to 21st century learning have been implemented.

The independent curriculum is a curriculum that directs students to have mastery and ability in the world of literacy properly and correctly. This literacy ability includes the skills of reading, speaking, writing, calculating and solving problems related to the daily life of students. In this case, all these abilities are formed and developed through optimizing the talents and interests of learners [20]. For example, for learners who are talented in writing, the learning provided for these students must be able to develop their abilities in writing. The application can be by training or extracurricular for students who are talented in writing. Or it could also be for students who are interested or like to speak, then the learning provided is no longer monotonous to the teacher who speaks, but also involves students. And also the student is provided with the right forum to channel his speaking interest with training to become an MC, moderator or reporter so that everything is more optimal and positively channeled. So that the improvement of student skills is also maximized.

Knowledge proficiency is also an important part to be achieved with the use of the independent curriculum at this time. Learners are given more optimal content in the intracurricular learning process so that learners have enough time to strengthen important concepts related to learning materials and also strengthen their competencies. The content in this intracurricular learning is also presented in a more diverse form so that the quality of students' knowledge can be further improved. The independent curriculum also emphasizes improvement in terms of student character. This is because the independent curriculum expects the formation of a Pancasila learner profile through projects that have been provided in the learning process. In addition, the independent curriculum also emphasizes the ability of students to master and use technology [21]. The application of 21st century learning is the most important point in the independent curriculum because the name technology will not be able to escape from human life at any time.

In addition to students' talents, interests and knowledge, the Merdeka curriculum is also very concerned about character formation and development. The Pancasila learner profile, which is one of the mandatory indicators and must be fulfilled in every lesson material in the Merdeka curriculum at this time, is an indicator that emphasizes these important values and character building. At every meeting or every material, it must have been emphasized about the profile of Pancasila students that will be created after the learning or material is completed. So this is also very much in line with the

indicators of 21st century learning which emphasizes the character of students or students.

The Merdeka Curriculum is expected to be a bridge so that students can be more independent in the learning process. So to be independent, students must be able to master technology so that it can be a tool in educational activities. The technology is not to replace the role of students' brains in thinking. However, the technology should be used to be a source and reference to make students more creative, innovative and critical again when learning. For example, today's AI (artificial intelligence) technology. AI is expected to help learners in the learning process to get important and global information. However, learners still should not solely rely on the ability of AI without any initiative and rely on their own brain abilities [22].

If at this time students are still unable or still not literate about the technological developments that are happening, then it is certain that students will be drowned by the progress of the times with the digitalization of AI advances. Do not let students only become connoisseurs of technological advances without any movement to stand hand in hand with these technologies. Students must be able to remain leaders in the future. Because, at this time technology has become a part of life for humans. So, it is necessary to have the readiness and ability of students to adapt and coexist with AI properly.

4   Conclusion

The results of the study show that the application of 21st century learning can indeed be seen in the independent curriculum at this time. The application of 21st century learning in this independent curriculum can be seen from the increase in literacy skills and student skills through the approach of developing students' talents and interests which is one of the goals of the independent curriculum. In addition, its application can be seen from the affective aspects of the independent curriculum to improve student character and emphasize students' ability to master technology, especially those related to the field of education. All of these are applications of 21st century learning that appear in the use of an independent curriculum.

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