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LIFE AND CAREER SKILLS IN MATHEMATICS LEARNING FOR HIGH SCHOOL STUDENTS IN INDONESIA: THE PERSPECTIVES OF TEACHERS AND STUDENTS

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Abstract

Students need to possess the right life and career skills to face future challenges. Therefore, this study aims to determine the effect of mathematics teachers' life skills on high school students in Indonesia. Data were collected from 190 mathematics teachers and 627 high school students through questionnaires consisting of 15 and 45 statements, respectively. The data collected were analyzed using the Structural Equation Modeling (SEM) method and the Smart-PLS v.3.2.9 software. The results showed that both mathematics teachers (77.50%) and high school students (83%) had a good understanding of life and career skills. However, their life skills were rated low due to teachers' difficulty in translating life and career skills into planning and implementing mathematics learning. This means that the methods used by teachers do not explore students' potential. Furthermore, the correlation between indicators of student life skills was found to be in the medium and large categories, indicating a significant relationship between the indicators of student life skills.

Keywords: life and career skills; mathematics learning; structural equation modeling

Abstrak

Para Siswa perlu memiliki keterampilan hidup dan karier yang tepat untuk menghadapi tantangan masa depan. Oleh karena itu, penelitian ini bertujuan untuk menentukan pengaruh keterampilan hidup guru matematika terhadap siswa SMA di Indonesia. Data dikumpulkan dari 190 guru matematika dan 627 siswa SMA melalui kuesioner yang terdiri dari 15 dan 45 pernyataan, masing-masing. Data yang terkumpul dianalisis menggunakan metode Structural Equation Modeling (SEM) dan perangkat lunak Smart-PLS v.3.2.9. Hasil penelitian menunjukkan bahwa baik guru matematika (77,50%) maupun siswa SMA (83%) memiliki pemahaman yang baik tentang keterampilan hidup dan karier. Namun, keterampilan hidup mereka dinilai rendah karena kesulitan guru dalam menerjemahkan keterampilan hidup dan karier ke dalam perencanaan dan pelaksanaan pembelajaran matematika. Ini berarti metode yang digunakan oleh guru tidak mengeksplorasi potensi siswa. Selain itu, korelasi antara indikator keterampilan hidup siswa ditemukan berada dalam kategori sedang dan besar, menunjukkan hubungan yang signifikan antara indikator keterampilan hidup siswa.
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***Kata kunci**: keterampilan hidup dan karir; pembelajaran matematika;* structural equation modeling

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Introduction

The rapid development of the 21st century requires everyone to possess the right skills in accordance with the globalization era. Students are not exempted, as they are expected to be equipped with learning and innovation skills, such as technology and information media. Therefore, this led to the adaptation of three 21st century education concepts, namely skills, scientific approaches, and authentic assessment by the Ministry of Education and Culture (2017). This can be seen from the revision of the 2013 Curriculum, which focuses on developing students in 21st-century skills. Trilling and Fadel (2009) stated that 21st-century skills are associated with (1) life and career, (2) learning and innovation, and (3) Information media and technology.

The importance of developing life and career skills can be seen from UNESCO's recommendations on the "four pillars of learning," which include learning to know, do, be, and live together. According to Article 3 of the Indonesia Constitution number 20 of 2003 concerning the national education system, national education aims to develop the potential of students to become citizens who believe and fear God, have a noble character, are healthy, knowledgeable, capable, creative, independent, democratic and responsible.

However, the importance of these life and career skills is not in line with some preliminary studies. Wahyudin, Rusman & Rahmawati (2017) stated that not all high school graduates (SMA) continued to Higher Education (PT). According to them, approximately 88.4% and 34 % of high and junior school graduates do not continue their studies to PT and high school, respectively, after graduating. Therefore, continuous improvements to the education system need to be carried out with more serious attention to the number of unemployed people to prevent the yearly increase.

The word skill in the Indonesian Dictionary (KBBI) is translated as ability and intelligence, therefore, life skills are defined as a person's ability to live. In Article 26 paragraph 3 No. 20 of the 2003 constitution, life skills education is the education that provides personal, social, intellectual, and vocational skills to work or independent business. According to the World Health Organization (WHO, 1997), life skills are various abilities to adapt and behave positively, which allows a person to face various demands and daily challenges effectively.

The Broad-Based Education team defined life skills as the abilities possessed by a person to face daily problems naturally without feeling pressured while proactively and creatively seeking solutions. Muhaimin (2003) and Anwar (2006) stated that life skills are interacting and adapting to other people or the community. These skills include making decisions, solving a problem, critical and creative thinking, effective communication, fostering interpersonal relationships, having self-awareness and empathy, as well as dealing with emotions and stress. Based on the above understanding, it can be concluded that life skills are the abilities possessed by a person to face future challenges.

The World Health Organization (WHO) categorized it into basic and strategic skills. According to the Ministry of National Education (2002), life skills are divided into two types, namely general and specific skills associated with certain jobs or circumstances. Meanwhile, Slamet (2001) divided it into basic and instrument life skills. Trilling and Fadel (2009), reported that the scope of life and career skills includes flexibility and adaptability, initiative and self-direction, social and cross-cultural interaction, productivity and accountability, as well as leadership and responsibility.

Life skills have a close relationship with real-life and are tools to develop all students' potential. Rasiman & Rahayu (2012) stated that one of the general functions and objectives of

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learning mathematics in schools is preparing students to develop their analytical skills, ways of thinking, reasoning, and mathematical ideas in daily life.

Previous research related to life and career skills has been quite a lot done. Research that focuses on developing 21st century skill scales that adopt partnership for 21st century skills (Ongardwanich, Kanjanawasee, & Tuipae, 2015; Arsad, Osman, & Soh, 2011) includes developing professional teacher indicators (Rino Richardo, 2016). In addition, there is also research that focuses on implementing the concept of life and career skills (Wahyudin, Rusman & Rahmawati, 2017; Kustiandi, Rizky and Putri, 2017). From the results of the research and previous studies above, it can be seen that research related to life skills (life skills) associated with learning mathematics is still relatively rare, especially life skills based on Islamic values.

Therefore, it is necessary to analyze how the teacher's perspective in planning and implementing life skills-based mathematics learning and how it influences students' lives and careers. This study also aims to see how much influence the indicators of student life and career skills have, namely: the effect of leadership and responsibility on flexibility and adaptability; the influence of leadership and responsibility on initiative and self-direction; the effect of leadership and responsibility on productivity and accountability, the effect of leadership and responsibility on social and cross-cultural interaction, the effect of flexibility and adaptability on initiative and self-direction, the effect of flexibility and adaptability on productivity and accountability, the effect of initiative and self-direction on productivity and accountability, the effect of initiative and self-direction on social and cross-cultural interaction and the influence of social and cross-cultural interaction on productivity and accountability.

Method

Data were collected by distributing life and career skills questionnaires to both mathematics teachers and high school students in Indonesia. Teachers' questionnaires were used to determine the strategies to plan and implement life and career skills in learning mathematics. Meanwhile, students questionnaire analyzes their life and career skills based on Trilling and Fadel's theory (2009), which consists of 5 indicators. These include leadership and responsibility, flexibility and adaptability, initiative and self-direction, social and cross-cultural interaction, as well as productivity and accountability. A total of 15 and 45 questionnaires validated by experts and experiments were issued to teachers and students, respectively. The scores given range from 1 to 4. Strongly agree is given a score of 4, agree is given a score of 3, disagree is given a score of 2 and disagree is given a score of 1. This statement also contains positive and negative statements. Questionnaire was distributed to the respondents in 9 provinces from July 18 to 30, 2020. The respondents consist of 437 students and 190 teachers, thereby culminating to 627 people.

Data analysis was carried out using the Structural Equation Model (SEM) method with the support of Smart-PLS v.3.2.9 software. SEM is used to define the relationship between the factors to be examined. The evaluation of the model in Partial Least Square (PLS) is carried out in two stages, by evaluating the measurement model to obtain the adequacy of the requirements and examining the structural model to analyze its quality. This study was carried out using a reflective measurement model with the instrument's validity determined through the Loading Factor (LF), the correlation between each measurement item and the variable. Furthermore, it was also carried out in accordance with Hair et al. (2011), Henseler et al. (2009), Chin (1998) and Gozali (2008) rule, as follows. Supposing LF $\geq$ 0.70, then the result is acceptable (valid). The reliability is shown by Composite Reliability (CR) based on Hair et al. (2011), Henseler (2009) and Sekaran (2014), where the minimum value of CR is 0.70. The CR formula is as follows.

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$$\rho_c = \frac{(\sum \lambda_i)^2}{(\sum \lambda_i)^2 + \sum Var(\varepsilon_i)}$$

Average Variance Extracted (AVE) is the average variation of each measurement item contained by the variable. According to Hair et al. (2011), Henseler (2009) and Gozali (2012) the value (AVE) is ≥ 0.50. The formula for AVE is as follows.

$$AVE = \frac{\sum \lambda_i^2}{(\sum \lambda_i)^2 + \sum Var(\varepsilon_i)}$$

The effect between variables is determined through the path coefficients and t-test. It significantly affects the t-statistic, which is more than 1.96, or the p-value is less than 0.05. Then to determine the size between variables, a further test is carried out with an effective size test, which is used to determine the f square score. The size of f square is in accordance with Hair et al.'s (2011) study where 0.02, 0.15, and 0.35 are in the small, medium, and big categories, respectively.

Results and Discussion

Results

The results obtain data on planning for high school mathematics teachers on life and career skills and their implementation on students in Indonesia. Table 1 shows that the average teacher score in planning and implementing life and career skills-based mathematics learning is 3.10 (77.50%) while students is 3.32 (83.00 %). The following is the overall questionnaire data for both teachers and students. More details are provided in table 1.

Table 1. Overall Life and Career Skills

No	Respondent	Total Score	Average	Percentage
1	Teacher	6.923	3,10	77,50
2	Student	56.259	3,32	83,00

Teacher Questionnaire Results

Of the 15 statements given, the highest average score is obtained in statement number 7, which asks students to develop their potential with a means value of 3.63. Meanwhile, the lowest average score is statement number 4 of 2.94, which identifies life skills capable of raising the subject matter. More details are provided in table 2.

Table 2. Teacher's Average Life Skills Based on Indicator

Category	Statement	Mean	Standard Deviation
Lesson Planning	(1) Formulate learning objectives that contain life skills before starting learning activities.	3,19	0,68
	(2) Develop learning materials by integrating life skills.	3,07	0,72
	(3) Determine learning methods that contain life skills according to the material to be delivered.	3,01	0,77
	(4) Identify life skills that can be raised through the subject matter.	3,01	0,74

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Category	Statement	Mean	Standard Deviation
	(5) Identify the knowledge, skills, and attitudes achievable through the subject matter.	3,03	0,77
	(6) Develop learning experiences that are equipped with life skills.	2,99	0,77
Learning Implementation	(1) Ask questions to students to develop their potential.	2,99	0,80
	(2) Involve students in every physical, psychological, or social teaching and learning activity.	3,36	0,72
	(3) Provide certain skills (attitudes) related to the subject matter.	2,97	0,76
	(4) Provide attitude development related to students' daily life.	3,20	0,74
	(5) Provide case studies to be discussed together.	2,99	0,78
	(6) Carry out contextual learning for students to use it daily.	3,15	0,74
	(7) Evaluate the learning process and provide feedback	2,95	0,72
	(8) Conduct attitude assessments such as discipline, honesty, responsibility, and obeying the rules	3,37	0,73
	(9) Ask students to demonstrate their knowledge and skills directly.	3,17	0,74

Student Questionnaire Results

This questionnaire was developed referring to life and career skills as part of 21st century abilities according to Trilling and Fadel (2009) which are adapted to students' learning mathematics. The following presents a complete questionnaire on students' life skills and careers in learning mathematics, More details are provided in table 3.

Table 3. Student Life And Career Skills Questionnaire

Indicator	Sub-Indicators	Statement
Leadership And Responsibility	Religious and Honest	Starting learning activities by praying makes you feel comfortable
		Studying mathematics with friends from different cultures creates an uneasy atmosphere
	Care for the environment and social	Trying to adjust when in a new mathematics learning environment.
		Trying to be patient when friends give sharp criticism of my math work.
Flexibility and Adaptability	Initiative and intrinsic learning motivation	Doing work because you love it
		Waiting for help, when experiencing difficulties
		Provide time to review material that has been taught
	Analyze assignments and learning needs	Look for the reasons for your failure in exams/tests
		Feeling confused about choosing the material that needs to be studied
	Set learning goals/targets	Set specific goals/targets when studying
		Seeing work without targets lightens the mind's load
	Choose, and implement learning strategies	Look for other learning strategies when you fail to complete a task
		Seeing the determination of learning strategies

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Indicator	Sub-Indicators	Statement
		will inhibit creativity
	Monitor, organize, and control learning	Trying to identify learning difficulties experienced
		Feeling anxious comparing self-position to the target that must be achieved
	Having the attitude or view that something is part of a complex whole	Seeing a problem as part of a more complex problem
		Breaking down a problem into separate parts
	Be open, flexible	Willing to change opinion when there is additional relevant information
		Reject opinions that differ from their own
Initiative and Self-Direction	Be sensitive to other people's feelings	Understand the feelings of other friends who have learning difficulties
		Feel happy with the success of other friends
	Utilizing other people's critical thinking	Study the biographies of prominent people
		Trying to capitalize on superior friend ideas
	Listen to the opinions of others with empathy	Empathize with other people's complaints/learning difficulties
		Feeling bored hearing the explanation of other people's answers
	Think flexible, reflective, confident, and open and can change his views when obtaining additional information	Feel capable of completing complex tasks
		Feeling frustrated facing failure in math tests
	Strive to work conscientiously and precisely. Strive to achieve high standards	Choose exercises that require higher thinking
		Select and solve routine/procedural problems
	Ask questions and raise problems effectively, accompanied by supporting data	Ask a simple math problem
		Ask for an explanation of the data provided
Social and Cross-Cultural Interaction	Make sharp use of the senses, think intuitively, and make approximate solutions	Guess the result based on existing data before doing the calculation
		Guess the answer based on your feelings
	Create, imagine, and innovate	Trying new ways of solving math problems
		It is futile to look at delusion in mathematics
	Dare to take responsibility and face the risk	Accept responsibility for mistakes made
		Fear of doing something risky
	Flexible in investigating mathematical ideas and trying to find alternative methods for solving problems	Feel safer applying familiar strategies
		Endure working on math assignments for a long time
	Interest, curiosity, and inventiveness in doing mathematical tasks	Studying math topics from various sources
		Feeling bored with completing tasks in various ways
Productivity and Accountability	Apply mathematics to other situations in mathematics and everyday problems	Applying mathematical concepts/principles in science and everyday problems
		Find it difficult to apply mathematics to everyday problems
	Share opinions with others	Enjoy studying in small groups
		Feel disturbed studying with friends

Figure 1 shows that the highest and lowest average indicators of 3.45 and 3.15 are flexibility and adaptability as well as leadership and responsibility, respectively. The average of the 5 indicators is shown in Figure 1.

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Figure 1. Average Life and Career Skills of Students based on indicator

Data Analysis Results

The instrument is validated by the expert using Smart-PLS v.3.2.9 as follows figure 2.

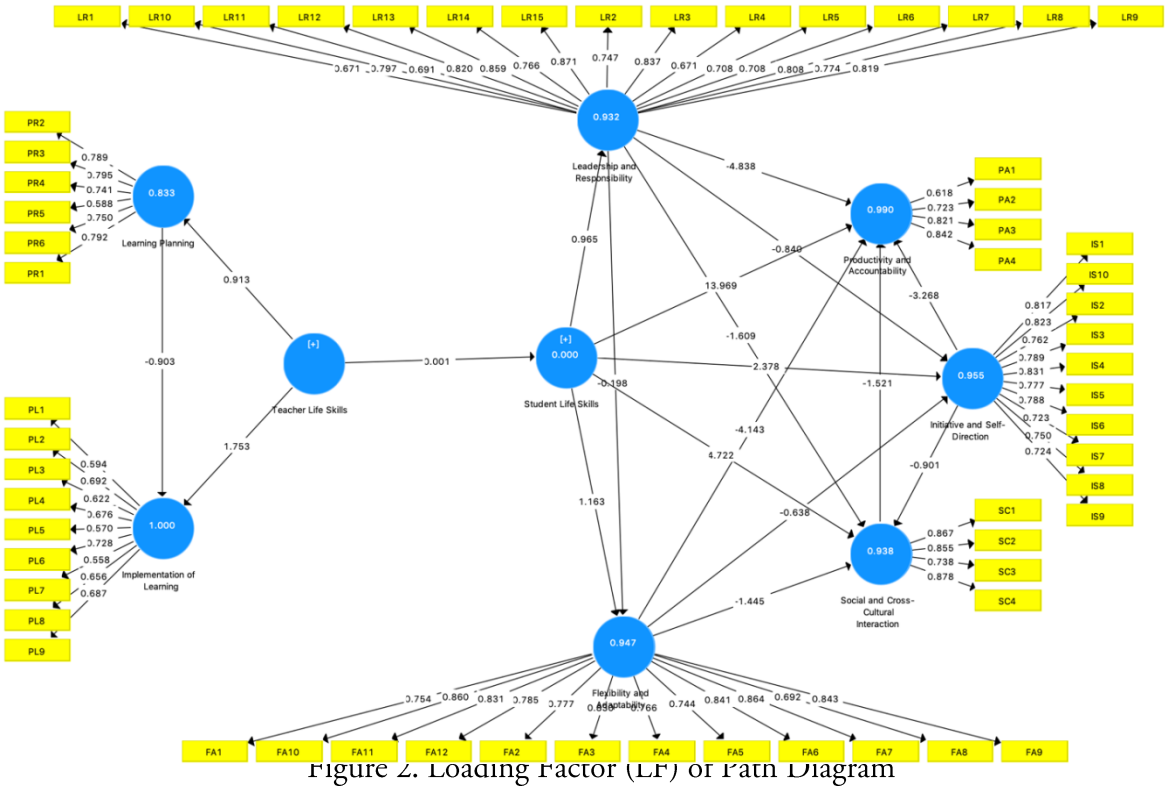

Figure 2. Loading Factor (LF) of Path Diagram

Figure 2 shows that several indicators are not valid. This is in accordance with Henseler et al. (2009), which stated that indicators accepted are assuming that they have a Loading Factor (LF) of more than or equal to 0.70 (LF 0.70). In learning planning, indicators with LF < 0.70 are coded PR5, while in the implementation, they are coded PL1, PL4, PL7, and PL8. In students' life skills, indicators of leadership and responsibility are coded with LR1 and LR4, while the productivity and accountability indicators are called PA1. After removing these indicators, reprocessing is carried out to determine the possibility of obtaining indicators with LF < 0.70. The result showed that all indicators have an LF > 0.70, therefore, they are all valid. The reliability level is obtained by looking at CR as shown in Table 4.

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Table 4. Construct Reliability and Validity

No	Variable/Indicator	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
1	Teacher Life Skills	0,931	0,935	0,940	0,513
2	Life Skills in Learning Planning	0,893	0,894	0,921	0,701
3	Life Skills in the Implementation of Learning	0,815	0,816	0,871	0,575
4	Planning	0,893	0,894	0,921	0,701
5	Student Life Skills	0,984	0,985	0,985	0,590
6	Flexibility and Adaptability	0,967	0,969	0,971	0,737
7	Initiative and Self-Direction	0,953	0,954	0,960	0,704
8	Leadership and Responsibility	0,950	0,953	0,957	0,630
9	Productivity and Accountability	0,753	0,753	0,859	0,669
10	Social and Cross-Cultural Interaction	0,926	0,929	0,948	0,819

Table 4 shows that all variables have CR above 0.70, which means the instrument developed is reliable. Meanwhile, the AVE value of all indicators is more than 0.50, which indicates that the average variance of the measurement items contained in the variables is above 50%. These results conclude that the evaluation of the measurement model from the convergent validity aspect is fulfilled. Furthermore, the path coefficients and t-test are shown in Table 5.

Table 5. Path Coefficient and t-Statistics

No	Relationship Between Variables/Indicators	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	t-Statistics (|O/STDEV|)	p-values	Conclusion
1	Teacher Life Skills -> Student Life Skills	-0,120	-0,118	0,053	2,263	0,024	Accept Ho
2	Teacher Life Skills -> Planning	0,935	0,936	0,010	95,086	0,000	Accept Ho
3	Teacher Life Skills -> Implementation	1,545	1,549	0,059	26,322	0,000	Accept Ho
4	Planning -> Implementation	-0,657	-0,661	0,071	9,199	0,000	Accept Ho
5	Teacher Life Skills -> Flexibility and Adaptability	-0,181	-0,044	0,187	0,970	0,332	Reject Ho
6	Teacher Life Skills -> Initiative and Self-Direction	-0,210	-0,023	0,201	1,047	0,296	Reject Ho
7	Teacher Life Skills -> Leadership and Responsibility	0,191	0,053	0,195	0,983	0,326	Reject Ho
8	Teacher Life Skills -> Productivity and Accountability	0,141	0,013	0,151	0,933	0,351	Reject Ho
9	Teacher Life Skills -> Social and Cross-Cultural Interaction	-0,193	-0,024	0,197	0,976	0,329	Reject Ho
10	Leadership and Responsibility -> Flexibility and Adaptability	-0,249	-0,248	0,039	6,340	0,000	Accept Ho
11	Leadership and Responsibility -> Initiative and Self-Direction	-0,592	-0,591	0,037	16,060	0,000	Accept Ho
12	Leadership and Responsibility -> Productivity and Accountability	-3,029	-3,038	0,140	21,689	0,000	Accept Ho
13	Leadership and Responsibility -> Social and Cross-Cultural	-1,347	-1,349	0,075	17,882	0,000	Accept Ho

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No	Relationship Between Variables/Indicators	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	t-Statistics (|O/STDEV|)	p-values	Conclusion
	Interaction						
14	Flexibility and Adaptability -> Initiative and Self-Direction	-0,451	-0,448	0,056	8,043	0,000	Accept Ho
15	Flexibility and Adaptability -> Productivity and Accountability	-3,296	-3,300	0,157	20,939	0,000	Accept Ho
16	Flexibility and Adaptability -> Social and Cross-Cultural Interaction	-1,580	-1,576	0,093	17,058	0,000	Accept Ho
17	Initiative and Self-Direction -> Productivity and Accountability	-2,591	-2,595	0,122	21,321	0,000	Accept Ho
18	Initiative and Self-Direction -> Social and Cross-Cultural Interaction	-0,855	-0,854	0,093	9,192	0,000	Accept Ho
19	Social and Cross-Cultural Interaction -> Productivity and Accountability	-1,011	-1,009	0,067	15,051	0,000	Accept Ho

Based on Table 5, the teacher's life skills p-value is 2.263 > 1.96 or the t-test value is 0.024 <0.05. This means that the hypothesis is accepted, or there is no significant influence between the life of the teacher on the ability of the students' life. Furthermore, to determine the effect size between variables, another test is conducted using the f square scores of 0.02 (small), 0.15 (medium), and 0.35 (big) (Hair et al., 2011). The value of teachers on students' life skills is 0.015 and in the low category. The results of the effect size test are shown in Table 6.

Table 6. Effect Size

No	Relationship between Variables/Indicators	*f square*	Conclusion
1	Teacher Life Skills -> Student Life Skills	0,015	Small
2	Teacher Life Skills -> Mathematics Learning Planning	6,982	Big
3	Teacher Life Skills -> Implementation of Mathematics Learning	3,733	Big
4	Lesson Planning -> Learning Implementation	0,675	Big
5	Teacher Life Skills -> Flexibility and Adaptability	0,034	Small
6	Teacher Life Skills -> Initiative and Self-Direction	0,046	Small
7	Teacher Life Skills -> Leadership and Responsibility	0,038	Small
8	Teacher Life Skills -> Productivity and Accountability	0,020	Small
9	Teacher Life Skills -> Social and Cross-Cultural Interaction	0,039	Small
10	Leadership and Responsibility -> Flexibility and Adaptability	0,194	Medium
11	Leadership and Responsibility -> Initiative and Self-Direction	1,288	Big
12	Leadership and Responsibility -> Productivity and Accountability	2,122	Big
13	Leadership and Responsibility -> Social and Cross-Cultural Interaction	1,645	Big
14	Flexibility and Adaptability -> Initiative and Self-Direction	0,284	Medium
15	Flexibility and Adaptability -> Productivity and Accountability	1,776	Big
16	Flexibility and adaptability -> Social and Cross-Cultural Interaction	1,532	Big
17	Initiative and Self-Direction -> Productivity and Accountability	1,809	Big
18	Initiative and Self-Direction -> Social and Cross-Cultural Interaction	0,411	Big
19	Social and Cross-Cultural Interaction -> Productivity and Accountability	0,689	Big

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Table 6 showed a big effect of teachers life skills on the planning and implementation of mathematics learning, with small or no effect on students life skill indicator. There are only two effects between the students' life skill indicators, namely a medium effect, including leadership and responsibility on flexibility and adaptability as well as flexibility and adaptability on initiative and self-direction.

Discussion

Overall Life and Career Skills

The implementation of life and career skills in school learning is presently an important aspect in the education process in Indonesia. This is because it creates quality human resources capable of providing answers to the challenges of the 21st century, which is unavoidable. Moreover, life and career skills equip students to face and solve life's problems as individuals, communities, and citizens.

Therefore, to accommodate educational needs, specifically for high school graduates who are unable to continue their education, a system based on life and career skills is very important. Students with skills relevant to job opportunities will survive in life's competition. According to Handayani (2009), education-oriented to life skills does not change or reduce the system only as job training. However, it also provides opportunities for each student to increase their potential and acquire skills that can be used as a source of livelihood.

In implementing the education policies oriented towards life and career skills, the focus needs to be on preparing students to have life skills. Therefore, formal education oriented to developing life and career skills needs to be systematically designed into the school curriculum. Furthermore, the gradual organization of subjects should tend to the areas of life and career skills with a balanced and proportionate time allocation according to the level of education and the type of school. The implementation of life and career skills education in schools, according to Handayani (2009), consists of the following: (1). The life skills-based curriculum, (2). Educational content life skills-oriented, (3). The learning process and the implementation of life skills-oriented education, (4). Organizing teachers, (5). Utilization of learning media, and (6). Education implementation strategy life skills-oriented. Therefore, teachers play a very important role in implementing life and career skills education.

Table 1 shows that the average life skills of teachers is 3.10 (77.50%) and students are 3.32 (83.00%) which are in the good category. Aspects of the teacher's lifestyle are divided into two aspects, namely lesson planning and learning implementation. In the planning learning aspect the lowest average score is in the statement "Developing learning experiences equipped with life skills" of 2.99. This shows that teachers still have difficulties in developing a learning experience that includes the length of life and student careers in the future. Whereas in the aspect of implementing learning, the statement that has the lowest average is the statement "giving certain skills (attitudes) related to the subject matter" of 2.97. In learning mathematics in the classroom, not all of the teacher's explanations are absorbed by students, including learning content that has an impact on students' life skills and careers. This is also in line with Marsigit's (1996) study, which showed a wide gap for mathematics teachers implementing learning theories.

One of the highest averages of the teacher's questionnaire is the statement "invite students to develop their potential". This means, in general, mathematics teachers in the learning process have used the technique of asking students to exhibit their potential. Asking questions in the learning process is very important because it enhances the thinking process (Critical Thinking Community, 2009). An effective way to bring out the potential of students is to invite them to think because this ability leads to answers that are generally provided in the form of questions.

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Therefore, the purpose of learning mathematics is to teach students to think and be ready to face the real world. This is appropriate with Donald Norman's study in Schafersman (1991), stating that the main purpose of learning mathematics is to improve students' thinking skills and prepare them for the world of work.

The lowest average of teachers life skills is in the statement "identify life skills that can be raised through the subject matter." This study proved that the educational output expected to produce students' life skills is not yet optimal. This can be seen from the difficulty of most mathematics teachers in identifying life and career skills that need to be developed in students. The goal of national education to develop students' life skills becomes an "ivory tower" or only a narrative structure when not supported by an appropriate cultural education environment. Therefore, applicative and structured teacher training is important to realize this goal.

Life and career skills education given to students should be thematically related to real-life problems. The themes need to be meaningful to students, both in present and future life. One approach that teachers can use is problem-solving related to mathematics subjects to strengthen students' mastery of life and career skills. Students become more trained to deal with real-life problems by applying a problem-solving approach. Another cause is the use of learning media available at school, in the surrounding environment, and outside. Learning media also need to be used significantly in the mathematics learning process.

The highest average score on student life skills is in the statement "trying to be patient when a friend gives sharp criticism of my math work." From these results, students have a good level of patience while being criticized by their friends concerning the results of their math work. This is certainly a very good capital to maximize students' life and career skills. Meanwhile, the lowest average score is in the statement "learning mathematics with friends from different cultures makes the atmosphere restless." Cultural differences in the classroom can be a barrier to developing the potential among students.

One of the methods used to overcome this problem is to bring mathematics learning closer to culture. Furthermore, the education process does not need to be separated from culture because mathematics is inseparable. Supriadi (2012) stated that 80% of the students did not understand the culture during mathematics learning. Therefore, by analyzing students' achievements in the field of mathematics globally, Indonesians are still below. This is because their curriculum is still eurocentric, hence, it is considered less suitable for the culture and character of Indonesian students. Countries such as Japan, Korea, and China have long used their culture in learning mathematics, indicating they are able to progress rapidly in all fields. According to Kurumeh (2004), the success of Japan and China in learning mathematics is because they use ethnomathematics methods.

Student Life and Career Skills Based on Indicator

The leadership and responsibility indicator looks at students' ability to lead and be responsible for the assigned learning tasks. Leadership, responsibility, and collaboration skills between teams are needed in the 21st century. According to Fiedler and Charmer (1974), the main issues of leadership include the techniques needed to become a leader, associated behavior, and what makes it successful. This study found that students' skills in determining their weaknesses are good. Those who still weak are related to anxiety in learning mathematics when they have cultural differences, which is still a problem for students. This is also supported by the finding that students have difficulty adapting when they are in a new learning environment. However, they are good at starting learning activities by praying and being patient when friends criticize their math work.

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It is important to determine how students show flexibility and adaptability to new and unexpected changes in assignments. Generally, they feel helpless when given a new task and cannot complete it due to their inability to construct knowledge spontaneously. According to Barak and Levenberg (2016), flexibility skill is the ability to reconstruct knowledge spontaneously by radically changing a situation. Therefore, this dynamic and adaptable skill is important for students to solve any difficulties they face. The good thing about this indicator is the anxiety that arises while comparing one's position to the target to be achieved. This means that students are good to control their learning targets and supported by the skill to determine the causes of failure in exams. Meanwhile, the weak skill is related to rejecting opinions that are different from their own. Moreover, some students still believe that the determination of learning strategies hinders creativity.

The initiative and self-direction indicator analyzes the strategies used by students to determine personal initiative, self-motivation, and self-regulation in any given task. In the world of work, this skill is essential because it provides active and quick training time where there is a lack of motivation. Workers need to have high motivation and be ready to use their initiative to solve problems and carry out daily work independently. According to Knowles (2007), self-direction is a person's actions to be responsible for planning, initiating, and learning. There are four stages in the self-direction process: being ready to learn, setting goals, engaging, and evaluating the process. The skill that is good from this indicator is that students accept responsibility for mistakes made. This sense of responsibility is important for better development. Meanwhile, weak skill is associated with the ability to imagine mathematics. The majority still think that imagining is a useless act, therefore, they find it difficult to think abstract mathematical concepts. This is certainly one of the obstacles experienced by students to develop their thinking skills related to abstract things.

An important aspect of social and cross-cultural interaction indicators is how students demonstrate these skills to understand diverse team members. Working effectively and creatively with team members and classmates regardless of social and cultural differences is a 21st-century life skill. Furthermore, understanding and accommodating social and cultural differences as well as using these differences to generate ideas and more creative solutions have become more important throughout this century. The good skill from this indicator is that students enjoy learning in small groups because it is more effective. Meanwhile, the weak skill is that students feel disturbed studying with friends, which means they have the low skill to cooperate in learning. This is detrimental to the students because there is no collaboration in learning.

Furthermore, the important thing to know through productivity and accountability skills is how productive students use their time and other resources and ways to carry out their assignments. Setting and meeting goals, prioritizing work, and using time appropriately are all skills that support good work and learning. Moreover, technology eases the burden of accountability and projects on learning which is also an important part of teaching in 21st-century learning. The good skill from this indicator is students' skills to feel anxious by comparing their position to the predetermined target. Positive anxiety helps students in learning success and be more productive and responsible. Meanwhile, the weak skill in this indicator is to reject opinions that are different from their own, which becomes an obstacle in the student learning process. Therefore, the process of discussion and collaboration in learning is very necessary.

Conclusion

This study concludes that the life skills of mathematics teachers and high school students in Indonesia are good. Teachers' life skills have a significant impact on the planning and

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implementation of mathematics learning, even though they have a minor effect on students and no significant effect on their indicators. This is because some teachers still have difficulty translating life and career skills into the planning and implementation of mathematics learning. Moreover, among the indicators of students' life skills, only two indicators - leadership and responsibility, as well as flexibility and adaptability on initiative and self-direction - have a medium effect, while the remaining indicators have a significant effect.

This study recommends that the government, through the Indonesia Ministry of Education and Culture, should emphasize and refine the education curriculum to incorporate life and career skills into mathematics learning. Therefore, teachers need to design more carefully planned mathematics lessons using teaching materials that can help to explore all the potential possessed by students in terms of cognitive, affective, and psychomotor aspects.

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