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Study of strengthening 21st-century skills in prospective science teacher based on gender

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ABSTRACT

21st-century skills are important for teachers. Pre-service teachers have to have the competence needed in the 21st Century to teach these 21st-century skills to their students in the future. This purposes of the study are the strengthening of the 21st Century Skills of pre-service teachers of science in three campuses, namely Sultan Syarif Kasim State Islamic University, Sultan Idris Malaysia University of Education, and Ar Raniry State Islamic University in Banda Aceh and to determine the correlation of 21st-century skills-based on gender. This study employed quantitative design using a survey research method. The instrument used for this study was the questionnaire of 21st century skills. The questionnaire for the 21st century skills are 30 items to represent the five constructs (Digital Age Literacy, Inventive Thinking, Effective Communication, High Productivity and Values and Spirituality) with the reliability index of the instrument was 0.84. This study was conducted on 250 pre-service teachers consisting of 46 male gender and 204 female gender from three campuses. The results showed that teachers of science had good reinforcement of The 21st Century Skills. While based on data analysis, the correlation between male and female gender is weak but has the same relationship to strengthening the 21st Century skills.

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Introduction

The World of Education enters the 21st century era which has been influenced by political, economic, social and cultural changes so as to change the educational system towards revolution in producing quality human resources (HR). In the 21st century learning, the ability to deal with the 21st Century Skills system and the influence of the industrial revolution 4.0 especially in Indonesia includes digital era literacy, inventive thinking, effective communication, high productivity and

spiritual norms and values (Soh, Arsad, & Osman, 2010; Trilling & Fadel, 2009; Vebrianto, Rery, & Osman, 2016).

To improve the quality of education and the quality of human resources, efforts are needed by institutions of higher education as the owner of authority in the world of education. Students who are specifically pre-service teachers in primary to secondary education must have an advantage in knowledge. Ireland (1991) explains that there are five pillars of education that include learning to believe to god, learning to know, learning to do, learning to be and learning to live together. Santyasa (2018), Wulan, Isnaeni, and Solihat (2018) suggest that The 21st Century Skills really need critical thinking skills, creative, collaborative abilities, metacognitive, communication skills, information technology literacy, become lifelong learners based on emotional intelligence, social, and spiritual good as citizens of the world. An institution of higher education carries out student activities as expressed by Nugraha, Hasan, and Annisa (2016) Development of student activities as a strategy to increase the competency of graduates in higher education includes: (1) Reasoning and Science, (2) Talent and Interest, (3) Welfare, and (4) Social activities. Martini (2018) expressed 21st century skills not only attitudes, skills and knowledge, but must be balanced with technology and critical thinking.

The 21st Century Skills of teachers currently experiencing problems as revealed by Rizal (2016) that the quality of Indonesian State HR in the category of low and low quality of Education. Lukitasari, Handika, and Murtafiah (2017) also revealed that learning at the university level was not yet specifically designed to train 21st Century Skills students. In addition, low metacognitive skills are very risky for the attitude of scientific students with low categories (Nurman, Hala, & Bahri, 2018).

Another problem is that much of the literature shows that teachers' limited opportunities to play a role in stimulating children's interest in science (Volet, Jones, & Vauras, 2019). In addition, according to Newall et al. (2018) that girls are less academically capable than boys in learning physics and give less scientific information and stereotyped women are considered to be at least enjoying science so these findings are considered to indicate weaknesses in education for girls because gender or stereotype. Gök, Aydın, and Weidman (2019) revealed that undergraduate degree unemployment is more when compared to those who do not have bachelor's degrees and meetings are more egalitarian than their male counterparts. In Japan the country experiences a shortage of manpower so that effective strategies are needed such as utilizing women in the fields of Science, Technology, Engineering and Mathematics (STEM) (Kitada & Harada, 2019).

The importance of 21st century skills for pre-service teacher are still relevant to the four pillars of life which include learning to know, learning to do, learning to be and learning to live together. Achieving this 21st century skill is done by overcoming the quality of learning, helping students develop participation, adjusting learning personalization, emphasizing project / problem based learning, encouraging collaboration and communication, increasing achievement and encouraging students, cultivating creativity and trying in learning, using facilities appropriate learning, designing learning activities that are relevant to the real world, empowering metacognition, and developing student-centered learning (Scott, 2015; Trilling & Fadel, 2009; Vebrianto et al., 2016).

In short, the advantages of it's find to education field, 21st century skills learning has main principles that learning must be student-centered, collaborative, contextual, and integrated with the community. So, it is clear that the role of pre-service teachers in conducting 21st century skills learning is very important in achieving a better future for the students.

New standards are needed so that pre-service teachers have the competence needed in the 21st Century to teach these 21st century skills to their students in the future. Several sources and researchers such as Trilling and Fadel (2009), Ledward and Hirata (2011), Partnership for 21 Treasury Learning (2008); The National Science Foundation, Educational Testing Services, NCREL, Metiri Group, Pacific Policy Research Center, and others demonstrate the importance of 21st century skills to achieve the transformation needed.

Skills for strengthening the 21st century skills are important in improving the quality of human resources (HR), So the importance of this research is to provide a good understanding of the 21st century skills to deal with the ASEAN Economic Community

(AEC). Especially to explain and explore the differences between the 21st century teachers skills based on their sex (male and female) to give information and recommendation about gender in science education system.

The impact and effect of the low ability of Higher Education Institutions in producing good human resources is necessary to analyze the strengthening of the 21st Century Skills of pre-service teachers in three campuses namely Sultan Syarif Kasim State Islamic University, Sultan Idris Malaysia University of Education and Ar Raniry State Islamic University in Banda Aceh. The 21st Century Skills Investigation of pre-service teachers based on gender refers to the skills of the 21st Century Skills from NCREL and the Metiri Group enGauge 21st Century Skills covering Digital Age Literacy (Lemke, 2002), Inventive Thinking, Effective Communication, High Productivity and Moral values and Spirituality in male pre-service teachers and female.

Method

This study employed quantitative design using a survey research method on the strengthening of the 21st Century Skills of pre-service teachers in three campuses namely Sultan Syarif Kasim State Islamic University, Sultan Idris Malaysia University of Education and Ar Raniry State Islamic University in Banda Aceh and to determine correlation of 21st century skills based on gender.

The instrument used for this study was The questionnaire of 21st century skills. The questionnaire on 21st century skills was developed based on the skills listed on the enGauge 21st century skills by The Metiri Group (NCREL), Soh et al. (2010) and Arsad, Osman, and Soh (2011). The questionnaire for the 21st century skills are 30 items to represent the five construct (Digital Age Literacy, Inventive Thinking, Effective Communication, High Productivity and moral Values and Spirituality). Since the instrument was adopted from previous studies, we can consider this instrument valid. In addition, a pilot study was conducted to obtain the reliability index of the instrument was 0.84. it is considered acceptable to good (George & Mallery, 2016), since the closer the alpha is to 1, the greater the internal consistency of the items.

This study was conducted on 250 pre-service teachers consisting of 46 male gender and 204 female gender from three campuses namely Sultan Syarif Kasim State Islamic University, Sultan Idris Malaysia University of Education and Ar Raniry State Islamic University in Banda Aceh. In this study, the type of research sampling technique is to use non random sampling with judgment/ purposive sampling. Purposive sampling was used to select samples based on university level, ICT facilities, and university location. Thus, the research samples taken are pre-service teachers at the Faculty of Education and Teacher Training of Sultan Syarif Kasim State Islamic University of Riau, Sultan Idris Education University and Ar-raniry State Islamic University in Banda Aceh. The data obtained were analyzed descriptively and quantitative testing by SPSS version 20.

Results and Discussion

Proficiency in digital era literacy was obtained to find out the strengthening of The 21st Century Skills of teacher based on Male Gender by paying attention to (B1) understanding of English science concepts, (B2) understanding of English science articles, (B3) assessment of science announcements, (B4) essay writing, (B5) reserve ideas, (B6) collaborative scholarship, (B7) products, (B8) product methods, (B9) internet use, (B10) use of social technology, (B11) issues of global warming and its links, (B12)awareness of the natural environment can be seen in the following Table 1.

Table 1. Strengthening of the 21st century skills of literacy digital era

Literacy digital era Aspect	Male		Female	
	Total	Average	Total	Average
B1	157	3.4	700	3.4
B2	156	3.4	692	3.4
B3	154	3.3	755	3.7
B4	155	3.4	721	3.5
B5	163	3.5	779	3.8
B6	168	3.7	780	3.8
B7	156	3.4	703	3.4
B8	167	3.6	732	3.6
B9	189	4.1	855	4.2
B10	168	3.7	823	4.0
B11	181	3.9	833	4.1
B12	196	4.3	910	4.5
Average		**3,6**		**3,8**
Category		**Agree**		**Agree**

Based on Table 1 shows that The 21st Century Skills of pre-service teachers based on gender or male gender is highest in the B12 aspect with an average of 3.3 categories of "Strongly Agree". While the lowest rating on the B4 aspect with a mean of 3.3 "Agree" categories. The average aspect of The 21st Century Skills for literacy skills in the digital age is 3.6 "Agree" categories. Strengthening The 21st Century Skills female teacher candidates in digital era literacy skills are highest in the B12 aspect with an average of 4.5 "Very Agree" categories, while the lowest average is 3.4 in aspects B1, B2, and B7 with an average of 3.4 categories " Agree". The total average aspect in digital era literacy for female teacher candidates is 3.8 in the "Agree" category.

The results of the strengthening assessment of The 21st Century Skills for pre-service teachers with male gender have the ability to dominate the awareness of environmental pollution issues and need more attention due to damage caused by human activity. Besides the strengthening of The 21st Century Skills by pre-service male teachers is able to the ability to understand the concepts of science, articles in foreign languages, express ideas, collaborative scientific knowledge with other sciences, produce and assess products, use the internet and good social media and care on global issues such as global warming.

Digital literacy skills in The 21st Century Skills male teacher candidates demonstrate weaknesses in essay writing and science talks. This makes a problem in the future, because of concern for global issues, good internet usage and skills in social media will not contribute more if unable to write essays and science talks in the external environment such as publishing essays that have been made to foreign countries or ASEAN countries. Essay writing will be able to reach foreign countries by participating in journal writing and so on and presenting publicly the importance of scientific scholarship to create good digital skills and balanced with the impact of unstructured scientific science.

The strengthening of The 21st century skills on literacy skills in the digital era of female teacher candidates is predominantly concerned with issues of environmental pollution that need attention. Other skills female teacher candidates try to assess the information given by science, be able to write essays, express ideas, collaborate on science and other science, make product comparisons, ability to use internet and social media are good and feel the issue of global warming is related to scientific knowledge.

In the literacy skills of the digital era where pre-service female teacher students have not been able to understand science concepts and science articles written in Foreign Languages such as English. In addition, the ability is still low in carrying out scientific studies or producing products to produce products using scientific knowledge of science to benefit economically. It should be understood that the literacy of the digital era where the ability of language has been helped manually by technological systems such as the use of Google translate can help translate articles and write journals. In addition to producing products from scientific knowledge can refer to the results of research that has been provided a lot of literature in the use of the internet. Excessive use of the internet such as only focusing on social media and viewing videos that are not related to scientific knowledge will be a great loss to produce quality human resources.

Weaknesses in essay writing are in accordance with research by Kahar (2018) that the level of digital literacy of students is very low on the components of seeking local potential information, and sharing information. Adiarsi, Stellarosa, and Silaban (2015) also explained that students access nearly 5 hours per day only for the needs of social media and instant messaging. In addition Stephen, Doecke, and Maire (2017) explained that technology has reduced the need for workers to complete manual tasks so that the other time that must be used is to focus on solving problems that are more strategic and think creatively.

The basis of the results of the research of several researchers indeed proved the weakness of essay writing has become a problem from the past so it needs attention to care in writing scientific essays. Van Laar, van Deursen, van Dijk, and de Haan (2019) explained that the level of digital skills of the 21st Century Skills varies so much that it requires a unique approach to the development of each skill.

Assessment of The 21st Century Skills category Inventive assessment of pre-service teachers based on the observed Gender of Men (C1) adjusting thinking, (C2)

solving problems, (C3) design, (C4) interests, (C5) accepting assignments, (C6) Thinking methods are seen in the following Table 2.

Table 2. Strengthening of the 21st century skills of inventive thinking

Inventive Thinking Aspect	Male		Female	
	Total	Average	Total	Average
C1	178	3.9	816	4.0
C2	186	4.0	835	4.1
C3	184	4.0	810	4.0
C4	196	4.3	838	4.1
C5	179	3.9	776	3.8
C6	182	4.0	783	3.8
Average	**4.0**		**4.0**	
Category	**Very Agree**		**Very Agree**	

Table 2 shows that the strengthening of The 21st Century Skills for the inventive thinking of male teacher candidates with the highest average was 4.3 in the C4 aspect with the category "Very Agree". While the lowest assessment on aspects of C1 and C5 with an average of 3.9 categories "Agree".

The average total for inventive thoughts of male teacher candidates is 4.0 in the category of "Strongly Agree". Strengthening The 21st Century Skills highest female teacher candidates in aspects C2 and C3 with an average of 4.1 categories "Strongly Agree", while the lowest average value on aspects of C5 and C6 with a mean of 3.8 categories "Agree". For the average strengthening of The 21st Century Skills in inventive thinking skills of 4.0 with the category "Agree". Pre-service male teachers in strengthening The 21st Century Skills inventive thinking with dominance in aspects of skills fostering interests such as curiosity for science learning and trust in self-efficacy in learning science. In addition, male teacher candidates have confidence and think various methods rather than various perspectives in solving problems.

The low of The 21st Century Skills male teacher candidates to adjust the ideas of the mind by following the changing times and accepting challenging scientific assignments even though they do not have confidence in it. This weakness needs to be focused attention so that the inventive thinking skills of the ability of the idea of the mind and accepting assignments that are considered inadequate to be faced will experience difficulties with the progress in the MEA because the need for the acquisition of various perspectives of thought connecting science with other scientific fields is needed.

Strengthening The 21st Century Skills pre-service female teachers in inventive thinking have the confidence to solve the problems at hand and make plans to make a source of information to solve the problems at a predetermined time. In addition, female teacher candidates can adjust ideas to be able to keep up with changing circumstances. The lowest value for inventive thinking on strengthening The 21st Century Skills female teacher candidates feel they are not yet optimal in accepting challenging scientific knowledge even though they do not have the confidence to do it. Then not yet fully think of various methods rather than various perspectives in solving a problem.

The need for inventive thinking skills becomes important in strengthening The 21st Century Skills for pre-service teachers, so that they can help in solving problems faced such as learning design, follow- up and agendas that must be achieved in the learning process. Inventive thinking is needed in strengthening The 21st Century Skills explained by Ali (2014) that inventive thinking is one of the skills of The 21st Century Skills important for citizens to achieve educational insight. Swallow (2017) explains technology and thought to play an important role in pedagogical approaches, and plays a central role of pedagogical integration and instruction. The ability to solve problems for pre-service teachers is very important to increase student productivity as expressed by Androutsos and Brinia (2019), that a teacher must be able to improve student competencies that are innovative, collaborative and co-creative so that it is not only the ability of one pedagogic field that must be owned by a teacher.

Table 3. Strengthening of the 21st century skills of effective communication

Effective comunication Aspect	Male		Female	
	Total	Average	Total	Average
D1	190	4.1	866	4.2
D2	187	4.1	839	4.1
D3	172	3.7	753	3.7
D4	189	4.1	849	4.2
D5	183	4.0	852	4.2
Average	**4.0**		**4.1**	
Category	**Very Agree**		**Very Agree**	

Strengthening The 21st Century Skills category of Communication Effective teacher candidates based on Gender Men include (D1) collaboration, (D2) collaboration ideas, (D3) solutions, (D4) responsibilities, (D5) good communication can be seen in Table 3.

Based on Table 3 shows that the strengthening of the 21st Century Skills on the highest effective communication skills is in the aspects of D1, D2, and D4 with an average of 4.1 "Very Agree" categories, while the lowest average on the D3 aspect is 3.7 with "Agree" categories. For an average aspect of 4.0, the category "Very Agree". Strengthening The 21st Century Skills aspects of D1, D4 and D5 with a mean of 4.2 categories "Strongly Agree", while the lowest rating on the D3 aspect with a mean of 3.7 categories "Agree". The average total of all aspects of effective communication is 4.1 with the category "Very Agree".

Strengthening The 21st Century Skills for effective communication with the dominant aspect dominance, namely students realize that the interests of cooperation in a collection by displaying a high leadership attitude and can share ideas and information with other communication groups and be able to accept the responsibilities given. In addition, students can solve the problems encountered through sincere conversation from all parties.

The lowest score results indicate that a mutual respect is needed, listening to the opinions of others so as to overcome problems between other groups. Leadership attitude in communicating is very necessary for pre-service teachers to be able to contribute to other parties without causing conflicts between other groups. In addition, this attitude needs to be instilled in students so that they become a provision in further education does not cause anarchist attitudes in the future.

Communication skills are effective in strengthening the 21st Century Skills female teacher candidates are dominated by skills in the awareness of the importance of cooperation in organizations by displaying high leadership attitudes. Then the ability to accept the responsibilities given and solve the problems faced through deliberation or sincere communication from all groups.

The low value of effective communication skills is seen in the inability to overcome conflicts that occur between groups or other organizations so that this becomes an important problem for educators who teach leadership to pre-service teachers. Conflicts that occur between organizations are usually triggered as a result of not being able to collaborate with other parties and opposing the decisions of other parties without prior consultation or joint agreement. Creating effective communication requires the encouragement of group institutions and social organizations in the form proposed by Astuti and Bukhori (2018) The form of social interaction according to the number of actors. b) Interaction between individuals with individuals. c) Interactions between individuals and groups. d) Interaction between groups and groups. Jones and Hansen (2015) explains that communication skills are now more important than ever, by sharpening good communication literacy.

Assessments on The 21st Century Skills category of High Productivity pre-service teachers based on Male Gender include (E1) schedules, (E2) reflections, (E3) technological literacy, and (E4) operational standards obtained in the following Table 4.

Table 4. Strengthening of the 21st century skills of high produvtivity

High productivity aspect	Male		Female	
	Total	Average	Total	Average
E1	176	3.8	841	4.0
E2	169	3.7	796	3.9
E3	174	3.8	818	4.0
E4	178	3.9	812	4.0
Average	**3.8**		**4.0**	
Category	**Agree**		**Very Agree**	

Table 4 shows the highest rating on the E4 aspect, with an average of 3.9 in the "Agree" category, while the lowest rating in the E2 aspect is 3.7 in the "Agree" category. For the average aspect with a value of 3.8 "Agree" category to strengthen The 21st Century Skills high productivity skills in pre-service teachers of male sex. The highest average aspect in The 21st Century Skills for high productivity of female teacher candidates is in the aspects E1, E3, and E4 with an average of 4.0 categories "Agree to Strongly Agree", while for the lowest average in the E2 aspect with a value of 3.9 categories "Agree". The average total aspect for high productivity was 4.0 with the "Agree" category.

Strengthening The 21st Century Skills for pre-service male teachers is dominated by the ability to use the standards provided to test and assess the product or study

results in order to have quality on the products produced. In addition, students can design a schedule intended to prepare each assignment given and use the appropriate technology in science projects in the activities that have been carried out.

Low results on making reflections on the design process of the given assignments so that there is a need for habits in all activities in the form of reflections of the results of the assignments given in order to be a follow up for the next assignment. This capability is also very necessary to be a guide in the future in improving the ability of The 21st Century Skills for effective communication.

Pre-service female teacher students have the skills to design time schedules for each assignment, can use technology tools that are appropriate to science projects and use product testing standards or the results of studies that have been conducted. While the weaknesses are proven that the ability to make reflections on the design process of the given assignment still needs attention.

The Weaknesses of the 21st Century Skills pre-service female and male teachers alike in making reflection becomes low in productivity. Beeler et al. (2019) explain that women and men have the same leadership or productivity skills, but different challenges in gender- based social contexts.

Strengthening observed in The 21st Century Skills aspects of Norms and Spiritual Values of pre-service teachers based on Male Gender include (F1) religious about science and technology, (F2) collaboration of science and Islamic science, (F3) interaction of nature and humans can be seen Table 5.

Table 5. Strengthening of the 21st century skills of moral value

Moral value aspect	Male		Female	
	Total	Average	Total	Average
F1	199	4.3	875	4.3
F2	181	3.9	888	4.4
F3	195	4.2	869	4.3
Average	**4.1**		**4.3**	
Category	**Very Agree**		**Very Agree**	

Based on Table 5, it shows that strengthening of the 21st Century Skills for norms and spiritual values of male teacher candidates with the highest score in the F1 aspect has a mean of 4.3 "Very Agree" categories, while the lowest mean value in the F2 aspect with a mean of 3.9 categories "Agree". The total mean in terms of norms and spiritual values is 4.1 with the category "Very Agree". The 21st Century Skills for norms and spiritual values of female teacher candidates with the highest average aspect in F2 is 4.4 "Very Agree" category, while the lowest value in F1 and F3 is 4.3 "Very Agree" category. For the average total norms and spiritual values that is equal to 4.3 categories "Very Agree".

The ability of the 21st Century Skills for male teacher candidates on spiritual norms and values in dominance by realizing that science and technology help balance human effort in using the natural resources of God's gifts by saving money. In addition, male pre-service teacher students acknowledge that all human endeavors are to understand the interactions between nature around and fellow humans.

Low expertise in scientific science always connects science with Islamic values needs attention. The ability of pedagogic or critical thinking cannot be well used without being accompanied by religious attitudes so that between natural science must be accompanied by Islamic science in order to become a force in maintaining the welfare of the natural surroundings and fellow human beings.

Strengthening The 21st Century Skills for norms and spiritual values of female teacher candidates dominated by scientific knowledge in the learning process is always associated with Islamic science, while the thing that still needs attention is the awareness that science and technology help humans to use natural resources is a gift from God that needs to be preserved. In addition, the value of humility in aspects of norms and spiritual values also in recognizing all human efforts is to understand the interaction between the natural surroundings and fellow human beings.

The 21st Century Skills analysis for pre-service teachers based on gender aims to see the difference in strengthening of the 21st Century Skills in literacy skills of the digital age, inventive thinking, effective communication, high productivity and values and spirituality.

the mean literacy skills of the digital era for pre-service female teachers are higher when compared to male teacher candidates. For inventive thinking skills, male teacher candidates are higher than women. In effective communication female teacher candidates are higher than men, and at high productivity male teacher candidates are

higher than women and the spiritual norms and values of female teacher candidates are higher than men. An analysis of the correlations or relationships between the strengthening of The 21st Century Skills male and female teacher candidates is required.

Based on Table 6 shows that the correlation between male and female teacher candidates has strong to weak differences based on their correlation and significance. Based on the highest correlation value on gender with norms and spiritual value of 0.44 while the lowest correlation is on gender with high productivity that is -104. Results of correlation that have a negative sign have a strong correlation between the two genders or gender.

Table 6. Correlation strengthening of the 21st century skills based on gender.

Paired samples correlations		N	Correlations	Sig.	Sig (2-tailed)
Pair 1	Gender/ literacy digital era	24	0.215	0.313	
Pair 2	Gender/ Inventive thinking	12	-0.189	0.556	
Pair 3	Gender/ effective communication	10	0.222	0.537	0.00
Pair 4	Gender/ High productivity	9	-0.104	0.790	
Pair 5	Gender/ Moral value	6	0.440	0.382	

The results of the significance value indicate that the value obtained is greater than 0.05 (> 0.05) so that the relationship between the two genders to the strengthening of the 21st Century Skills is weak correlation, but based on 2-tailed significance shows a smaller value of 0.05 (< 0.05) so that between the two genders the strengthening of The 21st Century Skills has the same relationship. Santoso (2014) explains if sig 2t < 0.05 means there is a relationship between the values of the two groups.

Conclusion

The results showed that pre-service teacher students had good reinforcement of The 21st Century Skills. While based on data analysis, the correlation between male and female gender is weak, but has the same relationship to strengthening the 21st Century Skills. The institution must be give information and workshops about the 21st Century Skills for students and teachers.

This proves that mile and female have the same ability to master of the 21st century skills, so this result can be interpreted that female are able to become male leaders in organization and education. Now it has been proven that several universities already have a female chancellor.

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References

Adiarsi, G. R., Stellarosa, Y., & Silaban, M. W. (2015). Literasi media internet di kalangan mahasiswa. *Humaniora*, *6*(4), 470–482. https://doi.org/10.21512/humaniora.v6i4.3376

Ali, A. O. (2014). Pemerkasaan pemikiran inventif di Negara Brunei Darussalam: Satu percubaan awal pengajaran dan pembelajarannya dalam mata pelajaran bahasa Melayu. *Procedia – Social and Behavioral Sciences*, *134*, 416–425. https://doi.org/10.1016/j.sbspro.2014.04.264

Androutsos, A., & Brinia, V. (2019). Developing and piloting a pedagogy for teaching innovation, collaboration, and co-creation in secondary education based on design thinking, digital transformation, and entrepreneurship. *Education Sciences*, *9*(2), 113. https://doi.org/10.3390/educsci9020113

Arsad, N. M., Osman, K., & Soh, T. M. T. (2011). Instrument development for 21st century skills in Biology. *Procedia – Social and Behavioral Sciences*, *15*, 1470–1474. https://doi.org/10.1016/j.sbspro.2011.03.312

Astuti, M. E. A., & Bukhori. (2018). Dinamika sosial koperasi mahasiswa. *Socio-Politica*, *8*(2), 217–226. Retrieved from https://journal.uinsgd.ac.id/index.php/socio-politica/article/view/3631

Beeler, W. H., Griffith, K. A., Jones, R. D., Chapman, C. H., Holliday, E. B., Lalani, N., … Jagsi, R. (2019). Gender, professional experiences, and personal characteristics of academic radiation oncology chairs: Data to inform the pipeline for the 21st century. *International Journal of Radiation Oncology*Biology*Physics*, *104*(5), 979–986. https://doi.org/10.1016/j.ijrobp.2019.01.074

George, D., & Mallery, P. (2016). *IBM SPSS statistics 23 step by step: A simple guide and reference* (Fourteenth). Retrieved from https://books.google.co.id/

Gök, E., Aydın, B., & Weidman, J. C. (2019). The impact of higher education on unemployed Turkish people's attitudes toward gender: A multilevel analysis. *International Journal of Educational Development*, *66*(April), 155–163. https://doi.org/10.1016/j.ijedudev.2018.10.004

Ireland, S. (1991). Learning to live together. *The Health Service Journal*, *101*.

Jones, S. M., & Hansen, W. (2015). The impact of mindfulness on supportive communication skills: Three exploratory studies. *Mindfulness*, *6*(5), 1115–1128. https://doi.org/10.1007/s12671-014-0362-7

Kahar, A. P. (2018). Analisis literasi digital mahasiswa calin guru biologi melalui proyek video amatir berbasis potensi lokal pada mata kuliah ekologi tumbuhan. *Pedagogi Hayati*, *2*(1), 1–13. https://doi.org/10.31629/ph.v2i1.330

Kitada, M., & Harada, J. (2019). Progress or regress on gender equality: The case study of selected transport STEM careers and their vocational education and training in Japan. *Transportation Research Interdisciplinary Perspectives*, *1*, 1–9. https://doi.org/10.1016/j.trip.2019.100009

Ledward, B. C., & Hirata, D. (2011). *An overview of 21st century skills. Summary of 21st century skills for students and teachers*. Retrieved from http://www.ksbe.edu/

Lemke, C. (2002). *EnGauge 21st Century Skills: Digital literacies for a digital age*. Retrieved from https://eric.ed.gov/?id=ED463753

Lukitasari, M., Handika, J., & Murtafiah, W. (2017). 21st century skills mahasiswa calon guru dalam pembelajaran matematika. *Prosiding Seminar Hasil Penelitian Dan Pengabdian Kepada Masyarakat UNIPMA*, 372–378. Retrieved from http://prosiding.unipma.ac.id/index.php/SNHP/article/view/423

Martini, E. (2018). Kebijakan pendidikan multikultural pada peserta didik non-Islam di sekolah Muhammadiyah kota Kupang. *Jurnal Pancasila Dan Kewarganegaraan*, *3*(2), 21–27. https://doi.org/10.24269/jpk.v3.n2.201 8.pp21-27

Newall, C., Gonsalkorale, K., Walker, E., Forbes, G. A., Highfield, K., & Sweller, N. (2018). Science education: Adult biases because of the child's gender and gender stereotypicality. *Contemporary Educational Psychology*, *55*(October), 30–41. https://doi.org/10.1016/j.cedpsych.2018.08.003

Nugraha, A., Hasan, S. U. N., & Annisa, F. N. (2016). Kegiatan kemahasiswaan: Strategi untuk meningkatkan kompetensi lulusan di perguruan tinggi. *Prosiding Seminar Nasional "Optimalisasi Peran Pendidikan Dalam Membangun Karakter Anak Untuk Menyongsong Generasi Emas Indonesia,"* 170–173. Retrieved from http://eprints.uad.ac.id/3366/

Nurman, R., Hala, Y., & Bahri, A. (2018). Profil keterampilan metakognitif dan sikap ilmiah mahasiswa jurusan biologi FMIPA UNM. *Prosiding Seminar Nasional Biologi Dan Pembelajarannya*, 371–376. Retrieved from https://ojs.unm.ac.id/semnasbio/article/view/6988/4000

Rizal. (2016). Mengajar cara berpikir, meraih ketrampilan abad 21. *Seminar Nasional Pendidikan PGSD UMS & HDPGSDI Wilayah Jawa Pendidikan*, 390–406. Retrieved from http://hdl.handle.net/11617/9134

Santoso, S. (2014). *Statistik multivariat* (Revisi). Jakarta: PT Elex Media Komputindo.

Santyasa, I. W. (2018). Student centered learning : Alternatif pembelajaran inovatif abad 21 untuk menyiapkan guru profesional. *Seminar Nasional*

Quantum, *25*, xix–xxxii. Retrieved from http://seminar.uad.ac.id/index.php/quantum/article/view/347

Scott, C. L. (2015). *The futures of learning 2: What kind of learning for the 21st Century?* Retrieved from http://repositorio.minedu.gob.pe/handle/123456789/3709

Soh, T. M. T., Arsad, N. M., & Osman, K. (2010). The relationship of 21st century skills on students' attitude and perception towards physics. *Procedia – Social and Behavioral Sciences*, *7*, 546–554. https://doi.org/10.1016/j.sbspro.2010.10.073

Stephen, L., Doecke, E., & Maire, Q. (2017). Developing collaboration skills in team undergraduate research experiences. *Educatian : Future Frontiers*, 1–71. https://doi.org/10.1080/10511970.2016.1188432

Swallow, M. (2017). The influence of technology on teaching practices at a catholic school. *Journal of Catholic Education*, *20*(2), 154–176. https://doi.org/10.15365/joce.2002072017

The Partnership for 21st century skills. (2008). *21st century skills, education & competitiveness*. 1–20. Retrieved from https://files.eric.ed.gov/

Trilling, B., & Fadel, C. (2009). *21st century skills: Learning for life in our times*. Retrieved from https://epdf.pub/

Van Laar, E., van Deursen, A. J. A. M., van Dijk, J. A. G. M., & de Haan, J. (2019). Determinants of 21st-century digital skills: A large-scale survey among working professionals. *Computers in Human Behavior*, *100*, 93–104. https://doi.org/10.1016/j.chb.2019.06.017

Vebrianto, R., Rery, R. U., & Osman, K. (2016). BIOMIND portal for developing 21st century skills and overcoming students' misconception in biology subject. *International Journal of Distance Education Technologies*, *14*(4), 55–67. https://doi.org/10.4018/IJDET.2016100105

Volet, S., Jones, C., & Vauras, M. (2019). Attitude-, group- and activity-related differences in the quality of preservice teacher students' engagement in collaborative science learning. *Learning and Individual Differences*, *73*, 79–91. https://doi.org/10.1016/j.lindif.2019.05.002

Wulan, A. R., Isnaeni, A., & Solihat, R. (2018). Penggunaan asesmen elektronik berbasis edmodo sebagai assessment for learning keterampilan abad 21. *Indonesian Journal of Educational Assesment*, *2*(1), 1–10. https://doi.org/10.26499/ijea.v1i2.7