A SURVEY OF 21ST CENTURY SKILLS ACQUISITION AMONG THE PRESERVICE TEACHERS OF TEACHER EDUCATION PROGRAMS

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Abstract:

21st-century skills are essential in teaching learners in a changing society. The role of educators is not just to transmit knowledge in the four corners of the classroom but also to change the lives of many people in the community where they live in. Hence this study was conducted to determine the 21st-century skills acquisition among preservice teachers. A total of one hundred thirty-three (133) respondents from the seven (7) programs of the Department of Teacher Education in the University of Mindanao, Digos College participated in the survey. Results show that respondents have a very high level of 21st-century acquisition in digital literacy, collaboration, social skills, creativity, while communication, critical thinking skills, and leadership show only a high level of acquisition. The overall result indicates that preservice teachers of the institution have a very high level of 21st-century skills. However, when analyzed by profile, overall 21st-century skill acquisition of preservice teachers shows no significant differences. These results can also be attributed to various factors associated with the acquisition of 21st-century skills.

Keywords: 21st-century skills, preservice teachers, skill acquisition, quality education

1. Introduction

21st Century education requires innovative and adaptive teachers with lifelong skills to promote 21st-century skills among learners. Teachers with strong perceptions towards problem-solving, critical thinking, cooperation, strong communication skill, and creativity are more capable of delivering 21st-century skills to the learners (Anagün, 2018). Hence, education alone cannot create a responsible, goal-oriented, and healthy society. Therefore, the promotion of 21st-century skills among learners who are the next

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members and leaders in the community is more promising (UNESCO, 2017), and all of these can be done by equipping teachers with the necessary 21st-century skills (Urbani, Roshandel, Michaels, & Truesdell, 2017). In addition, Goal 4 in the Sustainable Development Goals aims to promote quality education that promotes lifelong learning (United Nations, 2013). Further, Goal 16 emphasizes the promotion of peaceful and inclusive societies through making people participate in the decision-making (United Nations, 2013). These initiatives show the importance of developing the necessary skills for learners to be prepared in real-life situations.

The P21 (Partnership for 21st Century Learning) framework formulated by Battelle for Kids in 2019 is designed to help educators to integrate 21st-century skills in teaching (Battelle for Kids, 2019). Moreover, this framework highlights the three core 21st-century skills that learners must develop: life and career skills, learning and innovation, and information, media, & technology skills (Battelle for Kids, 2019). The following are necessary for promoting life and career skills: flexibility and adaptability, initiative, social and cross-cultural skill, productivity, and leadership. In fostering learning and innovation skills, learners must develop creativity and innovation, critical thinking skills, and communication skills. Further, information, media, & technology skills include the following competencies: information literacy, media literacy, and ICT information (Battelle for Kids, 2019). However, these skills must also be acquired and developed by educators first to pass it to the learners (Rotherham & Willingham, 2010). Thus, teachers need to train themselves to become 21st-century educators.

Training teachers to become 21st-century teachers requires a lot of training and preparation. This is because of many competencies and skills that are necessary to acquire. Training the preservice teachers must be prioritized to ensure that the next generation of educators become competent (Urbani, Roshandel, Michaels, & Truesdell, 2017). Moreover, to facilitate the development of preservice teachers, a prerequisite ICT learnings and curriculum that promotes a collaborative learner-centered environment is needed (Boholano, 2017). Another way to encourage 21st-century skills among preservice teachers is through flipped classrooms; in this way, awareness, self-efficacy, and collaboration concerns would increase (Hao & Lee, 2016). Aside from the methods and approaches to increase the competency level of students, spiritual values and character development must also be given priority (Afandi, Sajidan, Akhyar, & Suryani, 2019). Aside from the skills that the preservice teachers must acquire, character development is also considered. In this way, they will develop holistically.

In the Philippines, the implementation of the K-12 curriculum allows changes in basic education and higher education. K-12 curriculum will enable students to become more competent individuals by highlighting skills and holistic development (ACTRC Research Forum, 2015). In addition, the Philippines also integrated the 21Cs into the education systems. The DepEd Order No. 21 s. 2019 specifies that the K-12 program must also equip students with the necessary information media and technology skills, communication skills, learning and innovation skills, and life and career skills (Department of Education, 2019). Further, DepEd Order No. 42 s. 2017 (National

Adoption and Implementation of the Philippine Professional Standards for Teachers) focuses the Content Knowledge, pedagogy, critical thinking skills, and higher-order thinking skills (Scoular, 2020). To cope with the changes in basic education, higher education also changes the curriculum of offered programs; this is done by implementing the new General Education courses (CHED, 2013) aside from the specialized courses offered. These initiatives of the Philippine government implicate that the country is promoting 21st-century skills among learners and teachers.

Further, monitoring the 21st-century skills among preservice teachers becomes crucial with the emergence of the 4th industrial revolution and the 21st-century generation of learners. This issue becomes a global concern, especially to higher education institutions offering teacher education programs to produce teachers who can promote the necessary competencies in the changing world. Monitoring includes checking the competencies of each preservice teacher if they acquire the essential 21st-century skills before and after graduating. Conducting programs based on weak skills could support the holistic development of future teachers. Higher education institutions should monitor the overall aspects of students, not just focusing only on academic growth.

2. Objectives of the Study

This study aimed to determine the 21st-century skill acquisition among the preservice teachers of University of Mindanao, Digos Branch. Specifically, this study sought to explore the following queries:

    1) Determine the level of 21st-century skills of preservice teachers in terms of:
     1.1) Collaboration Skill,
     1.2) Critical Thinking Skill,
     1.3) Creativity,
     1.4) Communication,
     1.5) Digital Literacy,
     1.6) Social Skill,
     1.7) Leadership.
    2) Determine the level of 21st-Century skills acquisition of preservice teachers when analysed by:
     2.1) Program,
     2.2) Gender.

3. Method

3.1. Context

This study was conducted in the University of Mindanao, Digos Branch, Philippines, under the Department of Teacher Education (DTE). The department has eleven (11) programs; however, only seven (7) programs have preservice teachers during the span of

this study. The other four (4) programs were newly offered and do not have preservice teachers yet. The current seven programs with preservice teachers are Elementary Education - Generalist, Physical Education, Technical Education for Food Service Management, and Secondary Education specializing in English, Mathematics, Science, and Filipino teaching.

3.2. Respondents

Respondents of this survey were preservice students of the institution who were officially enrolled in the academic year 2021-2022. A total of one-hundred thirty-three (133) respondents answered the survey. The distribution of the respondents is reflected in Table 1.

Table 1: Characteristics of 133 incoming preservice teachers included in the study

Profile	f	%
Sex		
Male	52	39.0
Female	81	61.0
Program		
Elementary Education-Generalist (EE-G)	19	14.29
SE-English	34	25.56
SE-Mathematics	12	9.02
SE-Science	17	12.78
SE-Filipino	8	6.02
Physical Education	22	16.54
Food Service and Management (FSM)	21	15.79

3.3. Data Collection

The data were collected in the academic year 2021-2022 (Philippines) following the new school calendar of the university (start in August). This study aims to examine the 21st-century acquisition of the preservice teachers of the university. In employing the research's main objective, the researchers first secure an approval letter to the Department of Teacher Education program heads to allow them to implement the survey. A Google form was used in obtaining the respondent's data and 21st-century skill acquisition. After approval, the google form was sent to the class via the university's Learning Management System (LMS). After the data had been sufficed, the researcher then interpreted the result.

3.4. Research Instrument

The research instrument consists of two parts. The first part is for the profile of the respondents, and the second part is intended for the variables associated with 21st-century skill acquisition. Among the twelve (12) identified 21st-century skills, only seven (7) skills were used in the survey: collaboration, critical thinking, creativity, communication, digital literacy, social skills, and leadership. Results were interpreted under the following Likert-type scale:

Numerical Scale	Range of Means	Verbal Description	Descriptive Interpretation
5	4.20 – 5.00	Very High	The respondent highly agrees with the statements.
4	3.40 – 4.19	High	The respondent agrees with the statements.
3	2.60 – 3.39	Neutral	The respondent neither agrees nor disagrees with the statements.
2	1.80 – 2.59	Low	The respondent less agrees with the statements.
1	1.00 - 1.79	Very Low	The respondent disagrees with the statements.

3.5. Data Analysis

The data gathered were analyzed using the mean to determine the level of 21st-century skill acquisition among the preservice teachers, the Kruskal Wallis Test as a statistical tool to identify if there is a significant difference in the level of 21st-century skill acquisition among the preservice teachers when analyzed by program, and Mann-Whitney U test for the differences in terms of sex.

4. Results

4.1. Level of 21st Century Skill Acquisition

Table 2 presents the mean and standard deviation for each indicator of 21st-century skill acquisition. The result shows that digital literacy ($\bar{x}$=4.10, SD=.588) has the highest mean score, followed by collaboration ($\bar{x}$=4.09, SD=.518), social skills ($\bar{x}$=4.08, SD=.590), creativity ($\bar{x}$=4.04, SD=.582), communication ($\bar{x}$=3.99, SD=.557), critical thinking skills ($\bar{x}$=3.95, SD=5.64), and leadership ($\bar{x}$=3.93, SD=.546) respectively.

Table 2: Level of 21st Century Skills Among the Preservice Teachers

Indicators	$\bar{x}$	SD
Collaboration	**4.09**	**.518**
1. I am confident in my ability to create a task list.	3.99	.696
2. I am confident in my ability to help the team solve problems.	4.09	.640
3. I am confident in my ability to provide useful feedback.	4.12	.617
4. I am confident in my ability to help resolving issues.	3.75	.762
5. I am confident in my ability to respect other's perspectives.	4.48	.647
6. I am confident in my ability to involve others in the task.	4.26	.647
7. I am confident in my ability to complete tasks with the help of others.	4.04	.679
8. I am confident in my ability to use time wisely especially in conducting group projects.	4.04	.667
Critical Thinking Skills	**3.95**	**.564**
1. I am confident in my ability to understand how knowledge might transfer to other situations.	4.03	.609
2. I am confident in my ability to recognize my limitations and to create new alternative ways.	4.03	.668
3. I am confident in my ability to evaluate my own reasoning.	3.96	.694

4. I am confident in my ability to identify needed detail through the use of scientific inquiry.	3.91	.712
5. I am confident in my ability to broaden my own inquiry.	3.93	.698
6. I am confident in my ability to change ideas and justify it.	3.82	.737
7. I am confident in my ability to understand difficult questions.	3.87	.656
8. I am confident in my ability to assess the quality of data.	4.04	.644
Creativity	**4.04**	**.582**
1. I am confident in my ability to elaborate and improve my ideas.	4.11	.670
2. I am confident in my ability to use brainstorming to generate original and unique ideas.	4.12	.628
3. I am confident in my ability to find relevant sources of information.	3.96	.667
4. I am confident in my ability to use my imagination to create new things.	4.11	.666
5. I am confident in my ability to create unique and different outputs.	4.02	.679
6. I am confident in my ability to combine different ideas to generate new outputs.	3.95	.698
7. I am confident in my ability to promote a variety of creative ideas.	4.05	.650
8. I am confident in my ability to create ideas needed for the development of new ideas.	4.02	.674
Communication	**3.99**	**.557**
1. I am confident in my ability to use appropriate platforms in communication.	4.23	.635
2. I am confident in my ability to adapt a communication style appropriate to different situation.	4.12	.663
3. I am confident in my ability to speak fluently, clearly and professionally.	3.95	.666
4. I am confident in my ability to create a clear and interesting discussion.	3.93	.703
5. I am confident in my ability to present all information clearly.	3.94	.660
6. I am confident in my ability to clearly communicate various perspectives.	3.93	.659
7. I am confident in my ability to organize information.	3.95	.666
8. I am confident in my ability to answer questions logically.	3.93	.647
Digital Literacy	**4.10**	**.588**
1. I am confident in my ability to use the internet resources wisely.	4.24	.653
2. I am confident in my ability to use digital media to create my own texts.	4.13	.701
3. I am confident in my ability to save, store, and reuse information using ICT.	4.17	.702
4. I am confident in my ability to create outputs that suit to the different audience and situations.	3.94	.715
5. I am confident in my ability to use ICT appropriately.	4.09	.712
6. I am confident in my ability to create slides, spreadsheet, documents, and other important ICT tools.	4.12	.697
7. I am confident in my ability to use different types and formats of ICT.	3.96	.690
8. I am confident in my ability to use efficiently and effectively the various forms of educational technology.	4.13	.690
Social Skills	**4.08**	**.590**
1. I am confident in my ability to respond appropriately to peer-pressure.	4.04	.690
2. I am confident in my ability to control temper in conflict situations.	4.05	.727
3. I am confident in my ability to receives criticism.	4.09	.679
4. I am confident in my ability to initiates conversations with others.	3.98	.763
5. I am confident in my ability to accept other ideas.	4.18	.626
6. I am confident in my ability to makes friends easily.	4.05	.763
7. I am confident in my ability to gets along with other people.	4.13	.733
8. I am confident in my ability to cooperates with others.	4.11	.681
Leadership	**3.93**	**.546**
1. I usually know ahead of time how others will respond to a new idea.	3.87	.561
2. I understand how important is social fabric in the organization.	4.02	.603

3. I know how to manage people and resources.	3.88	.718
4. I can easily sense the emotional pressure when working in groups.	3.92	.652
5. I enjoy discussing organizational philosophy.	3.95	.670
6. I can easily resolve conflicts when working as a group.	3.94	.715
7. I am flexible enough when there are changes in the group.	3.92	.675
8. I love making strategic plan.	3.97	.685
Overall	**4.03**	**.510**

4.2. Level of 21st-Century Skills Acquisition Among Preservice Teachers in Terms of Program

Table 3 shows the results of a Kruskal-Wallis Test indicating that there is no significant difference in the level of 21st-century skills acquisition when grouped by the respondents' program, χ^2=5.099, p>.01. Moreover, this result is also true for all the indicators of the variable.

Table 3: Kruskal-Wallis test on the differences in the level
of 21st-century skill acquisition analyzed by program

Indicators	Groups	N	Mean Rank	Chi-Square	df	Asymp.Sig.
Collaboration	EE-G	19	57.13	6.527	6	.367
	FSM	21	70.88			
	English	34	68.69			
	Filipino	8	76.06			
	Math	12	50.33			
	PE	22	64.48			
	Science	17	80.62			
	Total	133				
Critical Thinking Skills	EE-G	19	54.97	5.388	6	.495
	FSM	21	64.29			
	English	34	73.43			
	Filipino	8	72.31			
	Math	12	55.96			
	PE	22	66.16			
	Science	17	77.32			
	Total	133				
Creativity	EE-G	19	63.63	2.254	6	.895
	FSM	21	63.29			
	English	34	71.72			
	Filipino	8	71.13			
	Math	12	58.58			
	PE	22	63.98			
	Science	17	73.82			
	Total	133				
Communication	EE-G	19	57.45	5.215	6	.517
	FSM	21	67.79			
	English	34	75.12			
	Filipino	8	73.94			
	Math	12	51.04			
	PE	22	66.34			

	Science	17	69.32			
	Total	133				
Digital Literacy	EE-G	19	53.34	9.969	6	.126
	FSM	21	61.31			
	English	34	78.21			
	Filipino	8	81.44			
	Math	12	51.54			
	PE	22	63.55			
	Science	17	75.47			
	Total	133				
Social Skills	EE-G	19	56.82	5.247	6	.513
	FSM	21	59.64			
	English	34	74.76			
	Filipino	8	79.06			
	Math	12	67.13			
	PE	22	61.75			
	Science	17	72.97			
	Total	133				
Leadership	EE-G	19	59.84	2.752	6	.839
	FSM	21	65.26			
	English	34	70.00			
	Filipino	8	78.88			
	Math	12	61.67			
	PE	22	63.30			
	Science	17	74.12			
	Total	133				
Overall	EE-G	19	55.50	5.099	6	.531
	FSM	21	64.38			
	English	34	73.96			
	Filipino	8	77.19			
	Math	12	56.67			
	PE	22	64.61			
	Science	17	74.76			
	Total	133				

*$p < .05$

4.3. Level of 21st Century Skills Acquisition Among Preservice Teachers in Terms of Sex

Table 4 shows a Mann-Whitney U Test on differences showing that, overall, there is no significant difference in the level of 21st-century skills acquisition (Mann-Whitney U(131)=1745.000, p=.096) when grouped by sex. However, differences were observed for indicators of critical thinking skills (Mann-Whitney U(131)=1559.000, p=.011), communication (Mann-Whitney U(131)=1674.500, p=.044), and leadership (Mann-Whitney U(131)=1593.000, p=.016) showing that females have higher ranks for these indicators than males.

Table 4: Kruskal-Wallis test on the differences
in the level of 21st-century skill acquisition analyzed by sex

Variables	Group	n	Mean Rank	Sum of Ranks	M.W.U	p
Collaboration	Male	81	62.10	5030.00	1709.000	.065
	Female	52	74.63	3881.00		
Critical Thinking Skills	Male	81	60.25	4880.00	1559.000	.011*
	Female	52	77.52	4031.00		
Creativity	Male	81	64.78	5247.00	1926.000	.399
	Female	52	70.46	3664.00		
Communication	Male	81	61.67	4995.50	1674.500	.044*
	Female	52	75.30	3915.50		
Digital Literacy	Male	81	64.23	5203.00	1882.000	.297
	Female	52	71.31	3708.00		
Social Skills	Male	81	66.51	5387.00	2066.000	.851
	Female	52	67.77	3524.00		
Leadership	Male	81	60.67	4914.00	1593.000	.016*
	Female	52	76.87	3997.00		
Overall	Male	81	62.54	5066.00	1745.000	.096
	Female	52	73.94	3845.00		

*$p<0.05$

5. Discussion

Acquisition of 21st-century skills is essential in the ever-changing society, where educators play a multi-role in harnessing students' holistic development and as a part of the community. The study shows that preservice teachers in the University of Mindanao, Digos City (AY 2021-2022) have a very high acquisition of digital literacy, collaboration, social skills, creativity, and increased acquisition of communication, critical thinking skills, and leadership. The overall mean score ($\bar{x}$=4.03, SD=.510) indicates that the 21st-century skills acquisition among preservice teachers is very high. Also, among the indicators, digital literacy skill shows the highest level of acquisition, indicating that the preservice teachers recognize the importance of ICT in education. Buckingham (2006) argues that media literacy provides the connection of classroom and ICT that could increase students' performance in the classroom. This notion becomes important especially in the transition of the education sector towards online-blended learning due to uncontrolled events/phenomena such as the COVID-19 pandemic. With the emergence of various ICT tools, teachers become more prepared in teaching and adaptive in the classroom. However, on the contrary, leadership skill receives the lowest acquisition, though data shows the skill acquisition is still high; however, teachers' role as the leaders in the classroom and the community (Valcks, Vanderlinde, & Devos, 2020) shows how significant is the result. Lynch (2016) noted that all teachers must develop and acquire leadership skills to become better teachers in their respective institutions.

Based on the result of the Kruskal Wallis test on differences, both programs (χ^2=5.099, p>.01) (including each indicator) and sex (Mann-Whitney U=1745.000, p>.01) show no significant differences. This means that program and gender are not associated

with 21st-century skill acquisition. However, results revealed that different programs acquired different levels of 21st-century skills. This result can be associated with the preferences of learners in learning the 21st-century skills (Ching Sing, Liang, Tsai, & Dong, 2020), learner's soft skills (Yan, Yinghong, Lui, Whiteside, & Tsey, 2019), and learner's attitude (Soh, Arsad, & Osman, 2010). Moreover, the result can also be associated with teachers' preparedness in each program in terms of their assessment and methods of teaching (Griffin & Care, 2014), perceptions (Anagün, 2018), and teaching skills (Saavedra & Opfer, 2012). Additionally, there were differences seen on the indicators of critical thinking, communication, and leadership where female preservice teachers have higher levels on these aspects than males, following the results of Tican and Deniz (2019). Together with the learning environment factor (Pearlman, 2010), these factors contribute to the 21st-century skills acquisition among the preservice teachers of the institution.

6. Conclusion

21st-century skills are very important to acquire and develop among the preservice teachers to be prepared to teach learners in the changing world. The current study examines the acquisition of selected 21st-century skills indicators to add new knowledge regarding the status of 21st-century skills of preservice teachers. Though there are various factors to be considered in learning and acquiring 21st-century skills, the need to monitor and assess the status of acquisition must be conducted by higher education institutions offering teacher education programs to better prepare future educators in the field of teaching. It is also very important to examine the changing role of teachers in the classroom and community as part of 21st-century skills. However, the modality of learning should also be considered when assessing the 21st-century skill acquisition of preservice teachers since it could highly affect the level of acquisition. Thus, it is imperative to consider the role of various factors in acquiring these skills to properly acquire the set of skills for the holistic development of the preservice teachers.

7. Recommendation

In light of the findings of the study, the following recommendations are drawn:

First, Higher Education offering Teacher Education Programs should conduct a separate study about the 21st-century skills acquisition of their pre-service teachers.

Second, using the result, an enhancement program should be developed and implemented for preservice teachers to be prepared when they become teachers in the future.

Lastly, monitoring of 21st-century skills acquisition should be implemented in all year-level of teacher education programs.

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Conflict of Interest Statement

The authors declare no conflicts of interest.

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