Measuring the Students' Practice of 21st Century Skills in a Philippine Catholic Senior High School

ABSTRACT

This paper assessed the extent to which students practice 21st-century skills, focusing on areas such as information and technology literacy, critical thinking and problem-solving, entrepreneurship and innovation, social responsibility and leadership, and career awareness relative to sex, grade level, strand, family monthly income, and parent's highest educational attainment. This also correlated with their demographics and 21st-century skills practice. Using the descriptive-correlational design, this was responded to by 141 stratified randomly sampled students employing the standardized questionnaire. Data analysis used mean, standard deviation, and point biserial correlation. Generally, they have a great extent of 21st-century skills practice where career consciousness was rated highest while critical thinking and problem-solving were the lowest. All demographics were rated to a great extent. Meanwhile, there was no relationship between their demographics and 21st-century skills practice. In conclusion, curricular, co-curricular, and extracurricular programs and activities of the Catholic school provide opportunities for the continuous improvement of the development and practice of the 21st century skills of the students. That is why, given the implications, it is recommended that the institution should ensure that all these avenues for learning are in place.

Keywords: Twenty-first-century skills, descriptive-correlational, senior high school students, Philippine Catholic school

1. INTRODUCTION

Twenty-first-century skills are essential for students to become globally competitive and life-ready [1]. These skills refer to the competencies or learning outcomes which are expected to be performed by the learners in the 21st century. Also, these skills encompass critical thinking and problem-solving, effective communication, collaboration, media and technology literacy, socio-cultural responsibility and leadership, entrepreneurship, self-management, and innovation [2]. When learners are 21st-century skilled, they become at par with global standards and expectations [3]. Additionally, these suffice their knowledge and attitude in their life and pursuit of employment [4]. Meanwhile, given the changing contemporary landscape, these skills make them flexible and adaptable to various challenges and circumstances [5]. Hence, incorporating these skills in the school's programs and activities is vital to expect these students to demonstrate these 21st-century competencies [6].

In response to these visions, the Philippine Department of Education [7], implemented the Enhanced K to 12 Basic Education Program as a potential educational reform. This curriculum envisions improving the basic education instructional delivery to provide Filipino learners with competence and skills in responding to 21st-century demands and be at par with international standards. Specifically, these skills include information, media, technology, learning and innovation, communication, and life and career. Meanwhile, in Catholic schools,

the Catholic Educational Association of the Philippines [8], the largest association of Catholic schools in the country, launched the Philippine Catholic Schools Standards (PCSS) to ensure 21st-century skills incorporation in instruction. These standards provide indicators to check if Philippine Catholic educational institutions meet the 21st-century demands while maintaining their evangelical mission [9].

However, despite these programs, there are factors affecting the learners' acquisition, development, and demonstration of 21st-century skills. Most students nowadays experience depreciation of values brought by their consumeristic, modernistic, and secularistic mindsets, affecting their disposition towards higher-order learning [8,10,11,12]. These learners were products of two-year pandemic instruction where the delivery of contents and assessments were questioned, compromising their knowledge, skills, and attitude acquisition [13,14,15]. Aside from this, in Catholic schools, the continuity of quality instruction has been compromised by the teachers' continuous exodus to public schools, affecting the learners' acquisition and practice of 21st-century skills [16,17].

Particularly, the educational objectives of the responding Catholic school envision providing their learners with a quality formation responsive to 21st-century needs. However, despite the school's good intentions, some students lack the disposition toward higher-order skills [18]. Most are also preoccupied with technology and social media, which affect their study habits and inclination to perform [19]. Also, their 21st-century skills development is compromised by conventional pedagogies like memorization and other traditional methods of instruction [13].

In Philippines, there were quantitative studies on students' 21st-century skills in high school learners as input to enhance learning activities [20] among state universities and colleges [21,22] on teaching economics [23], among the Technical Vocational Education and Training (TVET) students [24], Alternative Learning System (ALS) learners [25], Aeta learners [26], senior high school students using educational video clips [27], and 21st-century skills analysis among basic education students [28]. Despite these studies, there remains a significant lack of research on the assessment of 21st-century skills among Philippine senior high school students, particularly in Catholic schools relative to sex, grade level, academic strand, family monthly income, and parents' highest educational attainment. This study aims to address this gap.

Therefore, this study examined the extent to which students in a Catholic school in Central Philippines practice 21st-century skills, including information and technology literacy, critical thinking and problem-solving, entrepreneurship, innovation, social responsibility and leadership, and career consciousness considering sex, grade level, academic strand, family monthly income, and parents' highest educational attainment. Also, it correlated their demographics and 21st-century skills practice. Lastly, the findings are significant among Catholic schools in providing strategies and activities to continuously improve the students' development and demonstration of 21st-century skills.

The paper assumed that the students' demographics influence their practice of 21st-century skills, and this assumption was anchored on the P21 framework of 21st-century learning [29] and partnership for 21st-century skills [30]. Both frameworks argue that the student's background, orientation, and formation affect their 21st-century skills development and demonstration. Specifically, the P21 framework for 21st-century learning [29] claims that when these learners are taught the essentials of learning and are exposed to the 21st-century educational demands, they become masters of the skills, knowledge, and literacies that help them succeed in life and work. Meanwhile, the Partnership for 21st Century Skills [30] also argues that for learners to practice 21st-century skills and meet the global demands for knowledge and employment, they must invest academically to acquire and develop the necessary learning competencies. In this study, both frameworks have something to do with the students' 21st-century skills practice. Their profiles are essential elements in their 21st-century skills acquisition, development, and demonstration, which can ensure the achievement of their goals and objectives in life.

2. METHODOLOGY

The study employed a quantitative research design, specifically utilizing a descriptive-correlational approach. The descriptive approach assessed the extent to which students practiced 21st-century skills, while the correlational approach examined the relationship between students' demographics and their practice of these skills. A stratified random sampling method was used to select 141 senior high school students from a Catholic school as respondents for the study (Table 1).

Table 1. Profile of the Respondents

Variable	f	%
Sex		
Male	50	35.5
Female	91	64.5
Grade Level		
Grade 11	60	42.6
Grade 12	81	57.4
Strand		
HUMSS (Humanities and Social Sciences)	77	54.6
STEM (Science, Technology, Engineering, and Mathematics)	64	45.4
Family Monthly Income		
Low	79	56.0
High	62	44.0
Parent's Highest Educational Attainment		
High School	56	39.7
College	85	60.3
Total	***141***	***100.0***

In data gathering, the 41-item standardized questionnaire by Cevik and Senturk [2] was employed. The instrument was already validated by the authors. However, to check the items' fitness to the Philippine context, it was pilot tested again and yielded a reliable Cronbach's Alpha score of 0.90. The instrument was assessed using very poor to a very great extent ratings. Data analysis used mean and standard deviation to analyze their 21st-century skills practice. Using the Kolmogorov-Smirnov, the normality test revealed that the 21st-century skills practice [KS=0.069, p=0.098] was normally distributed. Hence, the parametric statistical tool was used. With this, point biserial correlation associated their demographics and 21st century skills practice. Finally, this study adhered to the guidelines set forth by the Philippine Health Research Ethics Board (PHREB), ensuring ethical integrity by upholding the principles of respect for persons, beneficence, and justice.

3. RESULTS AND DISCUSSION

3.1 Practice of 21st Century Skills of Students

Table 2 presents the Catholic school students' 21st-century skills practice. Generally, they have a great 21st-century skills practice (M=3.70, SD= 0.33) with career consciousness (M=4.40, SD= 0.54) as highest and critical thinking and problem-solving (M=3.11, SD= 0.40) as lowest. In sex, males (M=3.64, SD= 0.40) and females (M=3.73, SD= 0.29) rated great extent. However, in career consciousness, females (M=4.52, SD= 0.44) rated higher than males (M=4.17, SD= 0.64). Regarding grade level, grade 11 (M=3.70, SD= 0.38) and grade 12 (M=3.70, SD= 0.30) rated great extent. In strand, HUMSS (M=3.70, SD= 0.34) and STEM (M=3.71, SD= 0.33) rated great extent. In family monthly income, low income (M=3.69, SD=

0.37) and high income (M=3.71, SD= 0.29) rated great extent. Lastly, in parent's highest educational attainment, students with high school graduate (M=3.66, SD= 0.39) and college graduate parents (M=3.73, SD= 0.29) rated great extent.

Twenty-first-century skills practice refers to the learners' demonstration of competencies essential in facing the demands of education and life [2]. As shown in Table 2, the great 21st-century skills practice indicates that the students demonstrate the competencies necessary to survive the 21st-century demands. Also, this reveals that this Catholic school has provided training to help them acquire these capabilities, preparing them for college education, employment, and beyond. Undeniably, they have demonstrated commendable 21st-century skills. However, by not meeting the highest mark, there is still room for improvement, especially in the critical thinking and problem-solving component, with a moderate rating.

The overall great practice rating could be attributed to the Catholic school's available co-curricular and extracurricular activities that promote the students' skills application. Aside from curricular instruction, activities are potential avenues for learners to demonstrate 21st-century competencies. Examples are sports, musical, and literary activities, leadership opportunities, career programs, entrepreneurial exposures, immersions, and civic engagements, which are explicit in this Catholic school. Also, most academic requirements require technology and online applications like research and other performance-based outputs. These available activities may have influenced their overall 21st-century skills demonstration.

Studies support the idea that students' skills demonstration cannot only be developed through curricular instructions [31,32]. Balaguer et al. [33] and Palou Fons [34] agree that exposure to co-curricular and extracurricular activities is necessary to apply their knowledge and skills to validate their learned theories. Also, Chu et al. [35] and Eliyasni et al. [36] and Petalla and Doromal [37] argue that in curricular instructions, their learning should involve the transition from lower to higher-order skills to elicit knowledge transfer and application. Lastly, for effective student skills development and demonstration, balanced activities among curricular, co-curricular, and extracurricular activities are vital [38].

Meanwhile, career consciousness is a skill that makes the students college and employment-ready, guided by their prudent decision-making on what career path, courses, and profession to pursue [39]. The very great career consciousness indicates that among the domains, this is where they demonstrate well. This also acknowledges their exceptional career awareness and decision-making in preparation for college, employment, and life ahead. Several factors may influence their very high rating. There are Catholic school programs that perhaps have helped make these students career-conscious. First, their strand choice could be an influence since their enrollment signifies the course and career they wish to pursue. Their career choice depends on what career they pursue, exposing them to the profession they wish. In support, Quintos et al. [40], Fernandez et al. [41], and Gaviola et al. [42] found that the students' prudence in senior high school strand selection has been a big help in making them college-ready and career-conscious.

Also, the rating could be attributed to the school activities like career programs organized by the guidance and counseling services. Additionally, the college campaigns inviting these students to enroll in their schools have been a help in their career consciousness. Likewise, the National Career Assessment Examination (NCAE) has also helped their career path options. Studies support the essentials of school programs on career paths to introduce the necessity of students' prudent decision-making [40,39,43]. Their career consciousness as early as high school is critical, as supported by Quintos et al. [40] and Pascual [39]. When career awareness is established earlier, they put in place their career paths and directions [40]. Hence, provisions of varied school activities that elicit the students' career consciousness are necessary to develop and demonstrate this 21st-century skill among students.

Meanwhile, critical thinking and problem-solving are essential skills that help students develop higher-order competencies in addressing the various circumstances of life [44,45]. The domain's moderate result indicates their fair skills demonstration. However, this skill needs much attention among these students. The result could be ascribed to the lower-order instructional activities that limit remembering and understanding, like conventional memorizations, lectures, and discussions. These activities could be contributory to their moderate skills demonstration. Undeniably, they demonstrate these skills if acquired and developed [2]. As observed, though higher-order activities are integrated into the curriculum, most are unaccomplished due to the congested time allocation per topic, resorting to conventional instruction and lower-order performances to accomplish the course [46]. Studies support that when learners are provided with instruction focusing on lower-order skills, they are deprived of the higher-order competencies they can acquire and demonstrate [46,36]. These skills belong to higher-order competencies expected of the students to acquire and perform [44]. Also, the pandemic years have negatively contributed to their critical thinking and problem-solving skills acquisition and demonstration [18,13,47].

Additionally, students nowadays are on social media [48], which shortens their inclination to think and analyze [17,13]. They are prone to fake news, making them easily agree with the received information without analyzing its veracity, as supported by Burkhardt [49] and Petalla and Tatlonghari [48]. This condition might have influenced their moderate rating. Besides, most students nowadays ignore problems that compromise their skills acquisition and practice. A study supports the phenomenon that most learners have a poor disposition towards problems, especially if these concern social issues [50]. They are easily bored with critical analysis [51]. As observed, they are receptacles of knowledge, and this impedes the application of their skills [52]. Hence, these findings signify elevating the instructions to higher-order competencies to develop their critical and analytical skills toward diverse problems.

In sex, male and female students demonstrate 21st-century skills. This shows that they share equal opportunities to acquire and perform the skills. However, female students rated higher in career consciousness, signifying they are more conscious than their counterparts. This rejects the common belief that males are more prudent in career decision-making than females, as Rodzalan and Saat [53] support. This could be because girls are more participative and disposed towards career programs and decisions about what courses or professions to pursue, as supported by Tang et al. [54] and Tian et al. [55]. Meanwhile, in grade level, students in grades 11 and 12 demonstrate 21st-century skills. Here, the 21st-century skills practice does not depend on whether they are in grade 11 or 12. This result defies the notion that grade 12 students are more skillful than grade 11 because of their full knowledge acquisition [6]. Like sex, both share equal opportunities and exposures to demonstrate the skills learned.

Relative to strand, both HUMSS and STEM students demonstrate these 21st-century skills. Their skills practice does not depend on whether they come from STEM or HUMSS. Given the highly sophisticated lessons, this denies the common perception that STEM students are more skillful than HUMSS [6,56]. Undeniably, both strands share equally complex academic responsibilities that entail demonstrating knowledge and skills. Aside from STEM, HUMSS also has specialized topics that entail the performance of higher-order skills [57].

In terms of family monthly income, low- and high-income students demonstrate 21st-century skills. Here, their skills demonstration is not dependent on being a high or low family income student. Given the available resources, this defies those students from high family incomes to be more skillful than their counterparts [58]. Lastly, students with parents with high school and college graduate degrees demonstrate 21st-century skills. Here, their skills demonstration is not dependent on their parent's highest educational attainment. This defies the common thinking that those with parents who are highly educated are more skillful than their counterparts given academic guidance. There are highly educated parents who rely

mostly on school formation rather than their guidance [9]. Generally, further studies are needed to validate the demographic results (Table 2a,2b).

Table 2a. Practice of 21st Century Skills

Variables	Information & Technology Literacy			Critical Thinking & Problem-Solving			Entrepreneurship & Innovation		
	M	**SD**	**Int**	**M**	**SD**	**Int**	**M**	**SD**	**Int**
Sex									
Male	3.85	0.46	GE	3.11	0.45	ME	3.56	0.54	GE
Female	3.94	0.38	GE	3.11	0.37	ME	3.59	0.48	GE
Grade Level									
11	3.91	0.46	GE	3.16	0.44	ME	3.59	0.51	GE
12	3.91	0.37	GE	3.08	0.36	ME	3.57	0.49	GE
Strand									
HUMSS	3.90	0.43	GE	3.13	0.38	ME	3.60	0.47	GE
STEM	3.92	0.38	GE	3.09	0.42	ME	3.56	0.53	GE
Family Monthly Income									
Low	3.88	0.46	GE	3.17	0.42	ME	3.57	0.53	GE
High	3.95	0.33	GE	3.03	0.36	ME	3.59	0.45	GE
Parents' Highest Educational Attainment									
High School	3.85	0.48	GE	3.13	0.41	ME	3.54	0.55	GE
College	3.95	0.35	GE	3.10	0.39	ME	3.61	0.46	GE
Whole	***3.91***	***0.41***	***GE***	***3.11***	***0.40***	***ME***	***3.58***	***0.50***	***GE***

Note: Moderate extent (ME), Great extent (GE)

Table 2b. Practice of 21st Century Skills

Variables	Social Responsibility & Leadership			Career Consciousness			Practice of 21st Century Skills		
	M	**SD**	**Int**	**M**	**SD**	**Int**	**M**	**SD**	**Int**
Sex									
Male	3.71	0.55	GE	4.17	0.64	GE	3.64	0.40	GE
Female	3.87	0.43	GE	4.52	0.44	VGE	3.73	0.29	GE
Grade Level									
11	3.80	0.51	GE	4.34	0.57	VGE	3.70	0.38	GE
12	3.83	0.47	GE	4.44	0.51	VGE	3.70	0.30	GE
Strand									
HUMSS	3.80	0.52	GE	4.33	0.58	VGE	3.70	0.34	GE
STEM	3.83	0.43	GE	4.48	0.49	VGE	3.71	0.33	GE
Family Monthly Income									
Low	3.75	0.48	GE	4.41	0.54	VGE	3.69	0.37	GE
High	3.90	0.47	GE	4.39	0.55	VGE	3.71	0.29	GE
Parents' Highest Educational Attainment									
High School	3.72	0.54	GE	4.33	0.63	VGE	3.66	0.39	GE
College	3.87	0.44	GE	4.44	0.47	VGE	3.73	0.29	GE
Whole	***3.81***	***0.48***	***GE***	***4.40***	***0.54***	***VGE***	***3.70***	***0.33***	***GE***

Note: Great extent (GE), Very great extent (VGE)

3.2 Relationship between the Demographics and Practice of 21st Century Skills

Table 3 presents the relationship between the students' demographics and 21st-century skills practice. Using point biserial correlation, the results revealed that there was no relationship between sex [r(139)=0.132, p=0.118], grade level [r(139)=-0.009, p=0.913], strand [r(139)=0.016, p=0.854], family monthly income [r(139)=0.019, p=0.820], and parent's highest educational attainment [r(139)=0.099, p=0.243] and their 21st-century skills.

As shown in Table 3, the no correlation results indicate that their demographics do not influence the students' 21st-century skills practice. Here, their skills demonstration is not

determined by whether they are male or female, grades 11 or 12, HUMSS or STEM, high or low family income, and whether they come from parents with high school or college degrees.

In sex, the no correlation defies the common thinking that males are more skillful than females [53]. Relative to grade level, the absence of correlation defies the common notion that those in higher grades are more skillful than lower levels [6]. Likewise, it denies the perception that those from STEM have hard skills than HUMSS due to its specialized subjects [59]. This also disagrees with the claim that the student's academic classification influences their skills practice [13]. In income, the no correlation defies the common knowledge that those from higher family income demonstrate skills than those from low due to sufficient resources [58]. Lastly, in parent's highest education, the no correlation defies the common thinking that those with parents who graduated with higher degrees are more skillful than their counterparts due to the guidance they receive [60].

The no correlation results could be attributed to the fact that all these students are provided with equal Catholic school formation regardless of which categories they belong to. For example, in sex, grade level, and strand, all categories share equal chances to develop skills beyond instruction, which is explicit in Catholic school formation. Besides, HUMSS and STEM strands require critical analysis regardless of the disciplines [56,57]. In family income and parents' highest degree, it could be that these family aspects have less to do with their 21st-century skills acquisition and demonstration. Some parents even rely much on Catholic school formation for their children regardless of their degrees [9,10]. Hence, their skills practice could least be ascribed to the families to which they belong. Perhaps their skills and practice could largely be ascribed to the Catholic school formation or their personal experiences in achieving these competencies.

In support, Pahilanga et al. [13] and Fernando and Bual [45] found that the students' skills demonstration has something to do with their diverse opportunities to be independent. Here, the more the students are given opportunities for independence, the more they apply the skills learned. They are especially bombarded with complex academic responsibilities as graduating students, like research, term papers, and various performance tasks. These scenarios may give them more opportunities to apply their sense of independence, resulting in higher skills practice, as Leepo [61] and McCurdy et al. [62] supported.

Research highlights the importance of fostering independence as a valuable opportunity for students to develop and showcase their skills [63,64,45]. Hjort et al. [65] and Rochmat et al. [64] emphasize that independence allows students to apply the skills they have learned without external guidance. Moreover, Sipayung and Siswono [66] argue that when students are given the chance to be independent, they become more autonomous, which is crucial for effectively demonstrating and applying theoretical knowledge.

Theoretically, this paper assumes that the students' demographics influence their 21st-century skills practice, and this is anchored in the P21 framework of 21st-century learning [29] and partnership for 21st-century skills [30]. With no correlation between these variables, neither framework was validated. This means the student's background, orientation, formation, and profile do not determine their 21st-century skills demonstration, as argued in these two frameworks. However, further studies employing these variables and frameworks are encouraged to validate these claims.

Table 3. Relationship between the Demographics and 21st Century Skills Practice

Variables	r	df	p
Sex	0.132	139	0.118
Grade Level	-0.009	139	0.913
Strand	0.016	139	0.854
Family Monthly Income	0.019	139	0.820
Parent's Highest Educational Attainment	0.099	139	0.243

Note: Relationship is significant when $p \leq 0.05$

4. CONCLUSION

The students' practice of 21st century skills is a manifestation of their acquisition of the competencies and the Catholic school's promotion of quality instruction. However, given the results, these imply continuous improvement in the institutional programs and activities that give premium to the students varied avenues for skills demonstration of what they have achieved. With this, curricular, co-curricular, and extracurricular opportunities of the school shed light to the students' development and practice of these competencies. Likewise, the findings also imply the importance of rethinking instructional pedagogy and assessment to ensure the transference of learning from cognition to application. Meanwhile, this paper recognizes various limitations. This was conducted among the senior high school students of one Catholic school and did not generalize the practice of all Catholic educational institutions. This employed quantitative design and is limited to the mentioned demographics. It was also limited to the students' perceptions. Given these limitations, future researchers are encouraged to conduct further studies in a larger setting employing similar or other demographics to validate the claims. They may also conduct studies using other designs to provide in-depth analysis. Lastly, they may also consider the teachers' perspectives of their students' practice of skills.

Disclaimer (Artificial intelligence)

Option 1:

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

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