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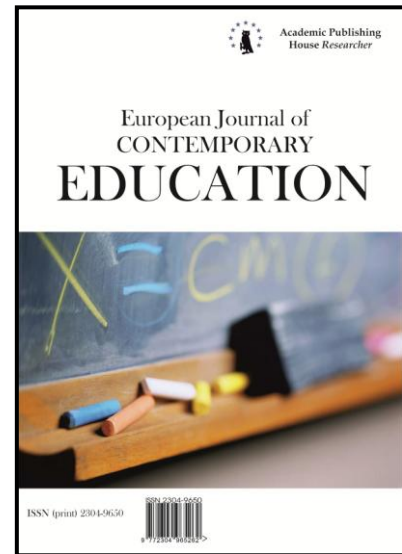
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### **21<sup>st</sup> Century-based Soft Skills: Spotlight on Non-cognitive Skills in a Cognitive-laden Dentistry Program**

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#### **Abstract**

Teaching and learning in the 21<sup>st</sup> century aim to produce students proficient in content knowledge, specific abilities, literacy, numeracy, and technology uses. From these 21<sup>st</sup> century skills, soft skills were delineated from these learning outcomes; and defined as intra- and interpersonal skills vital for personal development, social participation, and workplace success. This study has two goals: to determine the perceived extent of integration of 21<sup>st</sup> century-based soft skills in the cognitive-laden dentistry curriculum, and to examine the perceived 21<sup>st</sup> century-based soft skills of the student participants to serve as baseline data for future research. Communication, and relationship and collaboration skills will be critical components to motivate students; in turn, when students are motivated, it will encourage them to think critically and initiate actions toward the achievement of their goals.

**Keywords:** 21<sup>st</sup> century skills; soft skills; dentistry; curriculum; non-cognitive skills.

## **Introduction**

The learners of the 21<sup>st</sup> century face tons of challenging responsibilities. Learning is focused on the total development of an individual in all aspects of his life; that is the gist of 21<sup>st</sup> century education – preparing the future generation to face the challenges of real life situations to sustain the development of the world and make it a better place to live in.

In dentistry education institutions worldwide, there is a tendency to focus more on the cognitive and psychomotor aspects of learning because these programs are highly technical. As Kwon (2008) stressed, enabling the students to think critically is the fundamental goal of education. However, the affective aspect of learning should not be neglected since this is the period or generation wherein the total development of an individual is not centered on IQ or intelligence quotient anymore but with EQ or emotional intelligence as well. The significance of the non-cognitive skills cannot be overemphasized. Soft skills, critical in emotional intelligence, contribute more to an individual's ultimate success or failure than technical skills or overall intelligence (Goleman, 1995). Frymier (1994) explained the importance of motivation as a mediator in student learning, while Rodriguez, Plax, and Kearney (1996) expanded Frymier's work by comparing the Motivation Model to the Affective Learning Model, which asserts that teacher immediacy influences affective learning which, in turn, influences cognitive learning.

Jain (2009) states that for all institutions of higher learning to live up to the challenges of globalization, the following are the fundamental soft skills that must be implemented: communication skills, thinking skills and problem-solving skills, teamwork force, lifelong learning and information management, entrepreneur skill, ethics, morality and professionalism, and leadership skills.

This study adopted the specific outcome areas of soft skills utilized in the paper of Wilson-Ahlstrom, Yohalem, DuBois, and Ji (2011) because these specific skills came out as the most important ones necessary to be college- and career-ready, as gleaned from the frameworks developed by the Partnership for 21<sup>st</sup> Century Skills, Collaborative for Academic, Social and Emotional Learning, and U. S. Department of Labor. These are: communication, relationships and collaboration, critical thinking and decision making, and initiative and self-direction.

## **Communication**

As a process of sending and receiving information, communication may come in various forms – verbal or nonverbal. Wilson-Ahlstrom, et al. (2011) refers to communication as self-expression, listening, public speaking and recognizing nonverbal cues.

Dentistry students are expected to have excellent listening skills to be able to grasp all the relevant information during class discussions. Consequently, he or she must be able to express himself well whether in speaking or in writing to confirm comprehension of the subject matter. Recognizing nonverbal cues is also a vital skill for the student to distinguish the message relayed by body language and facial expressions of other people. That is what communication is about – sending and receiving information in any of its forms. This is a crucial skill as well when they start dealing with patients as dental professionals.

## **Relationships and Collaboration**

Relationships and collaboration refer to interpersonal skills, teamwork, flexibility and cultural competence (Wilson-Ahlstrom, et al., 2011).

Man was created to interact with others. The truth is, not everyone is good in handling relationships and collaboration. It takes a lot of understanding, compromises, sacrifices and effort. However, since these are skills, they are learned, or can be learned and developed (Kechagias, 2011). Dentistry students are always trained to be independent learners (initiative and self-direction skill) in preparation for becoming dentists in the future. Collaboration with fellow professionals especially when doing multidisciplinary practice or consulting with other medical practitioners is inevitable. Understanding that there will always be individual differences will not be enough; encountering these scenarios first-hand and resolving conflicts as they arise is an important experience in the school for them to be prepared after graduation. Dealing with patients entails relationships and collaboration skills as well, and learners must start developing these from their student days.

### Critical Thinking and Decision Making

Reasoning, creativity, responsible problem-solving, making judgments and decisions, and accessing, evaluating, and using information, are all elements of critical thinking and decision making skills (Wilson-Ahlstrom, et al., 2011).

Enhancing students' critical thinking skills is of utmost importance to teaching; in fact, enabling students to think critically is a fundamental goal of education (Kwon, 2008). Metlife Survey of the American Teacher (2011) notes that preparing students for college and career should focus more on critical thinking and performance skills rather than rote learning of information or knowledge of contents. Dentistry students learn theories essential for the practice of profession, but as the saying goes, do not tell them the solution to the problem; instead, teach them how to solve the problem. If dentistry students are equipped with critical thinking and decision-making skills, they can use these theories to solve problems that they are likely to encounter as professionals, whether these are covered in their syllabus or not. In their professional practice of transforming smiles of patients into upliftment of self-confidence, creativity and innovativeness are two other vital skills that can be developed in the enhancement of critical thinking skills.

### Initiative and Self-direction

Initiative and self-direction refer to self-awareness, self-management, setting and working toward goals, working independently, and guiding and leading others (Wilson-Ahlstrom, et al., 2011). For these future doctors, these skills are critical components of success in the workplace. Before they can lead and guide others to take care of their health, they need to set a good example.

These four specific skill areas are related to each other, in that, when an individual has good communication skills, his relationships and collaboration with other people also benefit. Similarly, his critical thinking and decision making skills are enhanced by the exchange of insights and resources as facilitated by good interpersonal skills. These improvements in one's self motivates the individual, thereby enhancing initiative and decision making skills.

## Method

### *Participants and Procedures*

Eleven experts in the field of curriculum and supervision, and educational management, with more than 20 years of teaching experience, graciously evaluated the professional preclinical and clinical courses in the current dentistry curriculum for the extent of integration of the 21<sup>st</sup> century-based soft skills in the syllabi.

Participants for the self-assessment of their 21<sup>st</sup> century-based soft skills, were 244 graduating dentistry students (73.4% female, 26.6% male) from the three campuses of the largest dental school in the Philippines (SEAADE, 2005). Two campuses were located in the National Capital Region. The third campus was located in the north, Region III, approximately an hour and a half away from the main university. Participants consisted of both local and international students (86.9% local, 13.1% foreign).

Data collection for this research project consisted of survey questionnaire, which was the primary source of data; while informal interviews and document analysis served as important tools for supplementing and analysing the data gathered.

Using a 4-point scale ranging from 1 (very little extent) to 4 (great extent), participants reported a self-assessment of their perceived 21<sup>st</sup> century-based soft skills. Scores ranged from 1.00 to 4.00. Participants were recruited by the researcher during enrollment period, and they completed the paper questionnaires instantaneously. Participation was voluntary and anonymity was assured.

## Results and Discussions

### *Perceived Extent of Integration of 21<sup>st</sup> Century-based Soft Skills in the Dentistry Curriculum*

Evaluation of the extent of integration of 21<sup>st</sup> century-based soft skills of the current dentistry curriculum included 16 professional courses (8 preclinical, 8 clinical). As shown in table 1, results revealed that opportunities to enhance communication skills, and relationships and collaboration skills of the learners are only to a 'moderate extent' to 'little extent'; while the critical thinking and decision making skills, and initiative and self-direction skills are integrated to a 'great extent,' except for a few courses, such as Oral Surgery 1 and 2, which got 'moderate extent' in critical

thinking and decision making skills; and Anesthesiology, Roentgenology, and Periodontology, which resulted to 'moderate extent' in both critical thinking and decision making skills, and initiative and self-direction skills.

This can be attributed to the fact that, in dentistry, especially in the professional courses, the understanding of theories and principles is given more emphasis rather than giving the learners the opportunity to communicate what they have learned, participate in collaborative learning and let relationships flourish, and eventually develop soft skills. Bias was noted using the lecture method in the delivery of theoretical material, and the learning methods employed may not support lifelong learning skills (SEAADE, 2005).

Enhancing students' critical thinking skills is of utmost importance to teaching; in fact, enabling students to think critically is a fundamental goal of education (Kwon, 2008). There may have been lack of emphasis on critical thinking and decision making, and initiative and self-direction skills in the objectives and activities presented in the syllabi of the professional courses which ranked 'moderate extent'. Indisputably, education planners are aware of the importance of initiative and self-direction skills in these courses as mandated by the mission of the school.

#### *Perceived 21<sup>st</sup> Century-based Soft Skills of the Student Participants*

In terms of communication, as shown in table 2, the student respondents demonstrated to a "great extent", complimenting and congratulating other people, with the highest mean of 3.51 and a standard deviation of  $\pm 0.59$ . Recognizing nonverbal cues in receiving information had the lowest mean of  $3.11 \pm 0.59$ . Overall, based on the perception of the student respondents of their 21<sup>st</sup> century-based soft skills, they have demonstrated the enumerated communication skills to a "moderate extent", which means approximately 60% of the time. Upon interview with some respondents, they articulated that is easier to compliment and congratulate other people anytime inasmuch as they do not have insecurities in themselves, even if they are not particularly friendly or good in oral communication skills. It makes them feel good as well to make other people happy by showing their appreciation. Recognizing nonverbal cues in receiving information got the lowest because they said that sometimes it is difficult to interpret body language, and facial expressions of other people, and to read between the lines.

In terms of relationships and collaboration, as shown in table 3, the student respondents demonstrated to a "great extent", respecting cultural differences and working effectively with people from a range of social and cultural backgrounds, with the highest mean of 3.55 and a standard deviation of  $\pm 0.61$ ; while leveraging social and cultural differences to create new ideas and increase both innovation and quality of work got the lowest mean of 3.32, a standard deviation of  $\pm 0.67$ , and a verbal interpretation of "moderate extent". Overall, based on the perception of the student respondents of their 21<sup>st</sup> century-based soft skills, they have demonstrated the enumerated relationships and collaboration skills to a "moderate extent", which means approximately 60% of the time. Upon interview with the respondents, considering that there is a sizable percentage of foreign students in the university, they displayed that they have learned the value of working around individual differences and respecting other cultures. However, utilizing cultural differences to create new ideas is quite difficult for them, and they would instead choose to avoid should any conflict arise.

In terms of critical thinking and decision making, as revealed in table 4, the student respondents demonstrated to a "great extent", ability to learn from experience with a mean of 3.60 and a standard deviation of  $\pm 0.59$ , followed by ability to identify and describe the problem when difficulty is encountered, with a mean of  $3.31 \pm 0.63$ , and a verbal interpretation of "moderate extent." Trying to work out problems by talking or writing about them ranked the lowest mean of 3.08 with a standard deviation of  $\pm 0.75$ , but still, to a "moderate extent". Overall, based on the perception of the student respondents of their 21<sup>st</sup> century-based soft skills, they have demonstrated the enumerated critical thinking and decision making skills to a "moderate extent", which means approximately 60 % of the time.

Students, especially in this university, are taught that values are more important than knowledge, and that they always have to look at the positive aspects of everything that is happening. This is probably why being able to learn from experience ranked the highest in their critical thinking and decision making skills. They consider mistakes as learning experiences and opportunities to become better. Trying to work out problems by writing or talking about them

ranked lowest because, according to an interview with some respondents, they are too busy on their clinical requirements to even worry about their problems.

In terms of initiative and self-direction, as shown in table 5, based on the perception of the student respondents of their 21<sup>st</sup> century-based soft skills, they have demonstrated the enumerated initiative and self-direction skills to a “moderate extent” overall, at 60% of the time. Highest mean was for reflecting critically on past experiences in order to inform future progress with a mean of 3.46 and a standard deviation of  $\pm 0.65$ , followed by developing a sense of purpose in life with a mean of  $3.45 \pm 0.70$ . Lowest mean was for utilizing time and managing workload efficiently with a mean of 3.10 and a standard deviation of  $\pm 0.67$ , followed by going beyond basic mastery skills and/or curriculum to explore and expand their own learning and opportunities to gain expertise, with a mean of  $3.18 \pm 0.64$ . However, these were all still interpreted as demonstrated to a “moderate extent”. Utilizing time and managing workload efficiently ranked the lowest, with a mean of 3.10, a standard deviation of  $\pm 0.67$ , and a verbal interpretation of “moderate extent”.

Interview reveals that reflecting critically on past experiences gives the respondents a sense of initiative and self-direction in what they are doing, not necessarily self-control. It gives them the motivation to move forward. However, with the abundance of clinical requirements ahead of them, they still feel a need to improve on their time and workload management skills. Going beyond mastery of skills ranked lowest, because as per interview with respondents, they are still at the level of mastery of skills; but they would probably consider pursuing that after passing the licensure exams or after a few years of dental practice.

Similar to a recent study, an individual does not need to have strong self-control to be able to invest in necessary effort of helping others. Probably, if the student participants would be allowed to recollect their primary goal of studying dentistry, they would be more initiated and self-directed in their pursuit to finish the program. This could be related to the study by Cortes, Kammrath, Scholer, and Peetz (2014), which found that self-control showed a null association with effortful social dos. Effortful social dos is doing things not for personal reasons but for the benefit of others. Many important learning tasks feel uninteresting and tedious to learners.

In summary, as shown in table 6, based on the perception of student respondents’ 21<sup>st</sup> century-based soft skills, relationships and collaboration skills ranked the highest with a mean of 3.41, a standard deviation of  $\pm 0.44$ , and a verbal interpretation of “moderate extent”; critical thinking and decision making ranked the lowest with a mean of 3.22, a standard deviation of  $\pm 0.41$ , and a verbal interpretation of “moderate extent”; initiative and self-direction is “moderate extent”, with a mean of 3.29 and a standard deviation of  $\pm 0.47$ ; while communication skills is “moderate extent”, with a mean of 3.26 and a standard deviation of  $\pm 0.39$ . Overall, the student participants perceive their 21<sup>st</sup> century-based soft skills as demonstrated to a “moderate extent”, with a mean of 3.30 and a standard deviation of  $\pm 0.43$ . This could be attributed to the fact that the students are aware that they are not perfect even if they are about to graduate from the program. They still need to learn a lot of things, and are still open to further development of their skills even after graduation.

In time for the ASEAN 2015 which was created to cater to the global trend of liberalization and regional integration in Southeast Asia, the Mutual Recognition Arrangement for Dental Practitioners was inked. This opened up for borderless practice of dentistry that has called for highly competitive professionals not just to attend to patients’ needs but to contribute to development and advancement of each country through medical tourism and promotion of overall well-being of the people. Preparing dentistry students for these international developments by enhancing their 21<sup>st</sup> century-based soft skills is undeniably important, considering the influence of these skills on their academic and professional success.

## **Conclusion**

Dentistry, as with all other medical programs, focuses more on technical skills due to the scientific nature of the curriculum. 21<sup>st</sup> century skills and soft skills as curriculum innovations may not have been fully integrated in the dentistry curriculum but it is never too late. Integration of these innovations in the teaching and learning activities will definitely influence the learning outcomes of the students. Communication, and relationship and collaboration skills will be critical components to motivate students; in turn, when students are motivated, it will encourage them to think critically and initiate actions toward the achievement of goals. Finally, as the forerunners of

this innovations reiterated, these skills will help the learners master the multidimensional abilities required of them in the 21<sup>st</sup> century and beyond.

**Tables**

Table 1: Synthesis Table for the Perceived Extent of Integration of the 21<sup>st</sup> Century-based Soft Skills in the Dentistry Curriculum

	<b>Great Extent</b>	<b>Moderate Extent</b>	<b>Little Extent</b>
1. Communication		Restorative Dentistry I Restorative Dentistry II Prosthodontics I Prosthodontics II Prosthodontics III Anesthesiology Roentgenology Orthodontics I Orthodontics II Pediatric Dentistry Oral Surgery I Oral Surgery II Oral Diagnosis Endodontics Periodontology Practice Management and Entrepreneurship	
2. Relationships and Collaboration		Restorative Dentistry I Restorative Dentistry II Prosthodontics I Prosthodontics II Prosthodontics III Anesthesiology Orthodontics I Orthodontics II Pediatric Dentistry Oral Surgery I Oral Surgery II Oral Diagnosis Endodontics Periodontology Practice Management and Entrepreneurship	Roentgenology
3. Critical Thinking and Decision Making	Restorative Dentistry I Restorative Dentistry II Prosthodontics I Prosthodontics II	Oral Surgery I Oral Surgery II Anesthesiology Roentgenology Periodontology	

	Prosthodontics III Orthodontics I Orthodontics II Pediatric Dentistry Oral Diagnosis Endodontics Practice Management and Entrepreneurship		
4. Initiative and Self-direction	Restorative Dentistry I Restorative Dentistry II Prosthodontics I Prosthodontics II Prosthodontics III Orthodontics I Orthodontics II Pediatric Dentistry Oral Surgery I Oral Surgery II Oral Diagnosis Endodontics Practice Management	Anesthesiology Roentgenology Periodontology	

Table 2: Perceived 21<sup>st</sup> Century-based Soft Skills (Communication) of the Student Participants

Communication	Mean	Standard Deviation	Verbal Interpretation
1. I articulate thoughts and ideas effectively using oral, written, and nonverbal communication skills in a variety of forms and contexts	3.20	0.51	Moderate Extent
2. I listen effectively to decipher meaning, including knowledge, values, attitudes, and intentions	3.28	0.55	Moderate Extent
3. I utilize multiple media and technologies, and know how to judge their effectiveness as well as assess their impact	3.24	0.58	Moderate Extent
4. I recognize nonverbal cues in receiving information	3.11	0.59	Moderate Extent
5. I compliment and congratulate other people	3.51	0.59	Great Extent
6. I get along with different kinds of people	3.35	0.65	Moderate Extent
7. I seek appropriate assistance and support from teacher or other adults in resolving problems	3.16	0.75	Moderate Extent
<b>Overall</b>	<b>3.26</b>	<b>0.39</b>	<b>Moderate Extent</b>

Table 3: Perceived 21<sup>st</sup> Century-based Soft Skills (Relationships and Collaboration) of the Student Participants

<b>Relationships and Collaboration</b>	<b>Mean</b>	<b>Standard Deviation</b>	<b>Verbal Interpretation</b>
1. I demonstrate ability to work effectively and respectfully with diverse teams	3.28	0.59	Moderate Extent
2. I exercise flexibility and willingness to be helpful in making necessary compromises to accomplish a common goal	3.43	0.63	Moderate Extent
3. I assume shared responsibility for collaborative work, and value the individual contributions made by each team member	3.36	0.58	Moderate Extent
4. I know when it is appropriate to listen and when to speak	3.41	0.67	Moderate Extent
5. I conduct myself in a respectable, professional manner	3.44	0.64	Moderate Extent
6. I respect cultural differences and work effectively with people from a range of social and cultural backgrounds	3.55	0.61	Great Extent
7. I respond open-mindedly to different ideas and values	3.48	0.63	Moderate Extent
8. I leverage social and cultural differences to create new ideas and increase both innovation and quality of work	3.32	0.67	Moderate Extent
<b>Overall</b>	<b>3.41</b>	<b>0.44</b>	<b>Moderate Extent</b>

Table 4: Perceived 21<sup>st</sup> Century-based Soft Skills (Critical Thinking and Decision Making) of the Student Participants

<b>Critical Thinking and Decision Making</b>	<b>Mean</b>	<b>Standard Deviation</b>	<b>Verbal Interpretation</b>
1. I reason effectively using various types of reasoning (inductive, deductive, etc.) as appropriate to the situation	3.18	0.57	Moderate Extent
2. I use systems thinking by analysing how parts of a whole interact with each other to produce overall outcomes in complex systems	3.14	0.59	Moderate Extent
3. I make judgments by effectively analysing and evaluating evidence, arguments, claims and beliefs	3.21	0.62	Moderate Extent
4. I analyze and evaluate major alternative points of view	3.29	0.59	Moderate Extent
5. I synthesize and make connections between information and arguments	3.18	0.64	Moderate Extent



6. I interpret information and draw conclusions based on the best analysis	3.15	0.67	Moderate Extent
7. I reflect critically on learning experiences and processes	3.28	0.61	Moderate Extent
8. I solve different types of non-familiar problems in both conventional and innovative ways	3.09	0.61	Moderate Extent
9. I identify and ask significant questions that clarify various points of view and lead to better solutions	3.16	0.62	Moderate Extent
10. I try to work out problems by talking or writing about them	3.08	0.75	Moderate Extent
11. I am able to learn from experience	3.60	0.59	Great Extent
12. I am able to identify and describe the problem when I encounter difficulty	3.31	0.63	Moderate Extent
<b>Overall</b>	<b>3.22</b>	<b>0.41</b>	<b>Moderate Extent</b>

Table 5: Perceived 21<sup>st</sup> Century-based Soft Skills (Initiative and Self-direction) of the Student Participants

<b>Initiative and Self-Direction</b>	<b>Mean</b>	<b>Standard Deviation</b>	<b>Verbal Interpretation</b>
1. I set goals with tangible and intangible success criteria	3.23	0.66	Moderate Extent
2. I understand my own moods and feelings	3.34	0.69	Moderate Extent
3. I engage actively in learning new things	3.36	0.64	Moderate Extent
4. I develop a sense of purpose in life	3.45	0.70	Moderate Extent
5. I balance tactical (short-term) and strategic (long-term) goals	3.23	0.70	Moderate Extent
6. I utilize time and manage workload efficiently	3.10	0.67	Moderate Extent
7. I remember important information	3.19	0.69	Moderate Extent
8. I keep trying when unsuccessful	3.42	0.65	Moderate Extent
9. I monitor, define, prioritize and complete tasks without direct oversight	3.20	0.67	Moderate Extent
10. I go beyond basic mastery of skills and/or curriculum to explore and expand my own learning and opportunities to gain expertise	3.18	0.64	Moderate Extent
11. I demonstrate initiative to advance skill levels towards a professional level	3.25	0.67	Moderate Extent
12. I demonstrate commitment to learning as a lifelong process	3.32	0.65	Moderate Extent

13. I reflect critically on past experiences in order to inform future progress	3.46	0.65	Moderate Extent
<b>Overall</b>	<b>3.29</b>	<b>0.47</b>	<b>Moderate Extent</b>

Table 6: Summary of Student Respondents’ Perceived 21<sup>st</sup> Century-based Soft Skills

	Mean	Standard Deviation	Verbal Interpretation
1. Communication	3.26	0.39	Moderate Extent
2. Relationships and Collaboration	3.41	0.44	Moderate Extent
3. Critical Thinking and Decision Making	3.22	0.41	Moderate Extent
4. Initiative and Self-direction	3.29	0.47	Moderate Extent
<b>Overall</b>	<b>3.30</b>	<b>0.43</b>	<b>Moderate Extent</b>

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