

# Student Outcome Assessment on Dentistry Program for 2014-2019

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**Abstract** – *Quality dental education produces quality dental practitioners who uphold the public's oral health. To ensure quality dental education, desired learning objectives and standards set by dental schools should be assessed if these are achieved proficiently by the students. Dentistry's student outcomes are composed of a variety of abilities that prepare the students for the clinical dental practice. This study evaluated the level of attainment of student outcomes in the dentistry program for batch 2019. The total population of 17 students was assessed using a quantitative analysis of the dental program's assessment matrix. The results showed that all student outcomes for batch 2019 exceeded the performance target of 81%. The proposed action plan was made based on the research findings. The College of Dentistry may seek opportunities to collaborate with international and local dental and medical health organizations in providing adequate interprofessional linkage and career development. Intensive training, conferences, and workshops are recommended for faculty to be effective in their teaching strategies and mentoring students in various specialties of dentistry. Faculty and students may also be exposed to research training and international forums to increase awareness of the current dental health challenges, best practices, and innovations. A culture of collaboration and open communication may be promoted among the administration, faculty, and students to address the pressing needs and challenges amidst the changing times and restrictions brought about by the pandemic. Increased awareness and cooperation among stakeholders are essential to overcome difficulties and make the most of the opportunities in the new normal.*

**Keywords** – dental education, dentistry, student outcome

## INTRODUCTION

Excellent dental education yields excellent dental practitioners who uphold the overall oral health of the public. To ensure quality dental education, it is imperative to assess whether the desired learning objectives and standards that were set by the dental schools and faculty are achieved proficiently by the students. It is advantageous to evaluate these student outcomes to make sure that learning has effects on society, the economy, and everyday life. Student outcomes should then be assessed whether it is viewed as the intended objectives of a course, program, or learning experience, or as the actual results that learners did or did not achieve during their university years.

Several theoretically grounded strategies have been created to improve learning outcomes in higher education. Since they specifically target educational difficulties and the processes that support them, well-constructed interventions based on social-psychological and motivation theories have shown to be incredibly successful. Such interventions assessed the value that students have in academic tasks, their framing of learning

difficulties, and their personal values [1]. Findings in the student outcomes assessment may also influence the policies and action plan that could improve the quality of dental education.

Student Outcomes of the Dentistry Program are composed of a variety of abilities that will prepare the students for the clinical practice of Dentistry. The knowledge and technical skills that the learners must obtain apply in the different clinical situations in the actual dental clinic. Dental students are also expected to actively participate and work with other health professionals to manage and treat the patient. Not only in private dental practice but as dental graduates, they will also have the ability to initiate and perform the basic dental health care services in the community, thereby engaging in the upliftment of public health.

Since the dental practice has been innovating in recent years, students must also recognize the need to engage in lifelong learning and participate in relevant research for the advancement of the dental profession. Understanding and adhering to the Code of Dental Ethics, students would be able to apply the principles of jurisprudence in the practice of the profession that would protect and

preserve dental practice and establish good standing within society. Students must also recognize that Dentistry is not just medical science, but it also has a business perspective in terms of employment, which would need knowledge and skills in entrepreneurship.

With all these relations in mind, the students are expected to communicate effectively with a range of audiences to facilitate good interprofessional teamwork and good patient rapport. Applying all of these and being able to pass the board exam will enable them to begin the dental practice, since passing the licensure exam is also an important outcome that would certify the quality of education received in the dental school as competent on the national standard.

### OBJECTIVES OF THE STUDY

This study aims to assess the Dentistry graduates on the level of attainment of the student outcomes, specifically 1) assess the student outcome of the Dentistry student batch 2019 and 2) propose an action plan to enhance the Dentistry program in LPU Batangas.

### MATERIALS AND METHODS

#### Research Design

This study used the descriptive method based on quantitative analysis to assess student outcomes. Simple descriptions of the sample and measures are provided by descriptive statistics. To transmit the most amount of information as simply as possible, summary measures, summary statistics, or descriptive statistics are used to summarize a set of data [2].

#### Respondents of the Study

The participants of the study were the Dental Proper 4 students, batch 2019. A total of 17 students represented the summative data and was the total population of the students who finished the program in 2019. Excluded from the population are those who have incomplete requirements and are not yet finished with their ongoing courses and clinical cases.

#### Data Collection Procedure

Student outcome was assessed from the curriculum map designed by the faculty experts, the department chair, and the dean. The data came from the records of the students on their major courses. Upon request to the college and approval of the dean, the researchers retrieved the final grades through the college secretary. The final grades were taken from the class records of the faculty members handling the Dentistry students of batch 2019.

### Data Analysis

The assessment matrix was used to tabulate and analyze the data collected from the class records. The average of the student's grades was compared to the performance target. For all performance measures, an eighty-one percent (81%) objective was set. With the intent of achieving above the Board Licensure Examination for Dentistry passing score of 75% [3] and producing topnotchers, the college set the performance target at 81% beyond this 75% passing score. For each student result, percentage and rank were utilized to determine if the performance target had been met or not.

### Ethical Considerations

Recognizing the importance of safeguarding the individual's privacy and with respect to the Data Privacy Act of 2012 [4], the researchers ensured that no personal information was revealed and only the grades of the batch of students are mentioned for the purpose of research only. The College of Dentistry, through its dean, college secretary, and faculty members also gave their permission to access the pertinent records to study the data for the benefit of improving the dentistry program.

### RESULTS AND DISCUSSION

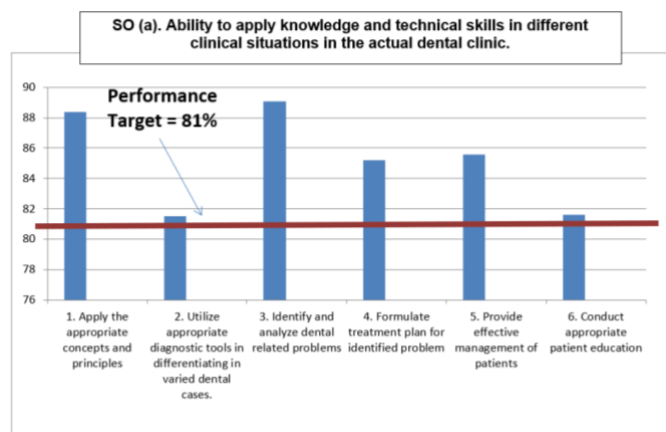


Fig. 1. Student Outcome (a).

Figure 1 presents the Student Outcome A: Ability to apply knowledge and technical skills in different clinical situations in the actual dental clinic. Based on the results, performance indicator 3: Identify and analyze dental-related problems got the highest percentage of 89.1%, and performance indicator 2: Utilize appropriate diagnostic tools in differentiating in varied dental cases got the lowest percentage of 81.5. This means that the performance target of 81 percent was achieved in all performance indicators for student outcome A.

“Identify and analyze dental-related problems” got the highest percentage because the students were trained well in their pre-clinical years to the principle of diagnosis and correlating various dental problems to other factors which they applied and appreciated later in their clinical cases.

Dental students must be prepared for their own dental practice. This necessitates flexibility, adaptability, and the ability to use technical skills in real-world settings. Universities provide a variety of chances for learners to experience learning in the context of the workforce while pursuing their degrees to help them acquire these abilities [5]. In the simulation of the actual dental clinic, the dental students were able to use their knowledge and technical skills in a variety of clinical circumstances by engaging in a variety of clinical cases in the dental dispensary. They were able to make use of the proper concepts and principles to differentiate between various dental cases. Using suitable diagnostic instruments, they can detect and investigate dental issues. Upon proper diagnosis, students can create a treatment strategy for the identified issue and are tasked to deliver appropriate patient management. In all these steps, they were able to educate their patients appropriately.

“Utilize appropriate diagnostic tools in differentiating in varied dental cases” got the lowest percentage because of the limited availability and exposure of the students in using the wide range of diagnostic tools in the clinic. Due to the cost and sensitivity of these diagnostic tools, it is challenging for students to fully maximize and spend on these resources. Some of the high-end diagnostic tools in dentistry such as cone beam computed tomography, laboratory and culture testing, and artificial intelligence machines, are also not available in the clinic, nor within the locality for educational and clinical purposes. To be able to utilize these diagnostic tools, both the faculty and students must be familiarized and trained for their appropriate use and technique. Dental education will need to be accompanied by the introduction of clinical AI technologies, which will require future dental professionals to be digitally literate [6].

Figure 2 presents Student Outcome B: Ability to actively participate/work with other health professionals in the management and treatment of the patient. Based on the results, performance indicator 3: Identify cases for referral to other institutions got the highest percentage of 89.1, and performance indicator 2: Recognize the need to communicate, refer and work with other health teams got the lowest percentage of 81.5. This means that the performance target of 81 percent was achieved in all performance indicators for student outcome B.

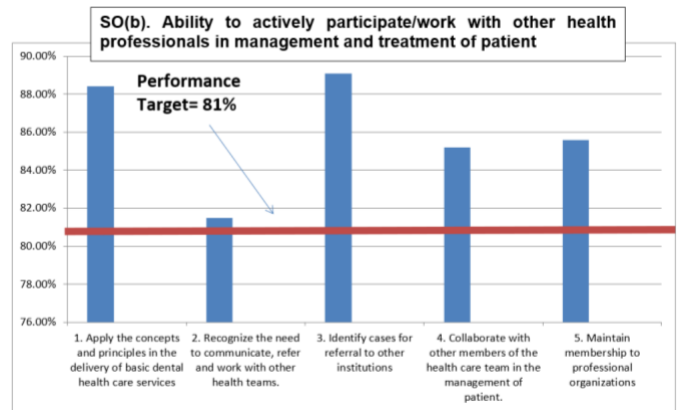


Fig. 2. Student Outcome (b).

“Identify cases for referral to other institutions” got the highest percentage because the students were properly oriented on the specialization in dentistry and other branches of health and medicine in their basic dental science courses.

They learned the importance of taking an active part in patient management and treatment, as well as in collaborating with other health professionals. They were able to employ the concepts and principles when providing basic dental health care so that they may properly communicate, refer, and collaborate with other health care providers when the need arises.

However, “Recognize the need to communicate, refer and work with other health teams” got the lowest percentage due to the student’s limited opportunity to interact with other health care professionals or institutions outside the dental dispensary. Although they were able to attend seminars sponsored by various dental health organizations, clinical consultation and practice engagement are less. Students need to keep their communication with professional groups so that they could contact them if a referral should be in place. In the management of patients, working with other members of the health care team is important in ensuring the optimum success rate of dental treatment [7].

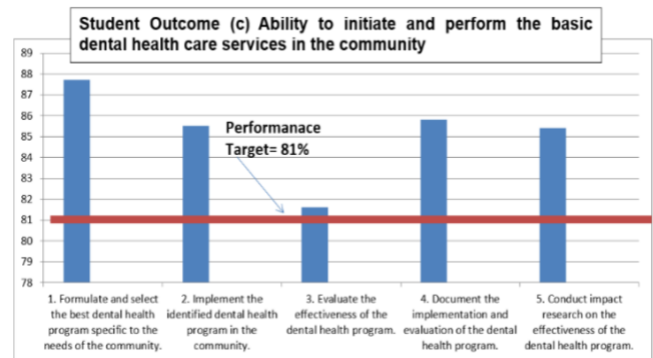


Fig. 3. Student Outcome (c).

Figure 3 presents the Student Outcome C: Ability to initiate and perform basic dental health care services in the

community. Based on the results, performance indicator 1: Formulate and select the best dental health program specific to the needs of the community got the highest percentage of 87.7, and performance indicator 3: Evaluate the effectiveness of the dental health program got the lowest percentage of 81.6. This means that the performance target of 81 percent was achieved in all performance indicators for student outcome C.

“Formulate and select the best dental health program specific to the needs of the community” has the highest percentage due to the students’ exposure to the adequate discussion, collaboration, and actual practice of dental health programs in the adopted communities and beneficiaries of the college. Students were encouraged to create and implement the college community extension programs, with the guidance of their faculty and dean. Because of the diversity of the population, exposure to community service raises their understanding of oral health disparities and a wide range of dental difficulties. Basic dental service and oral health promotion may have a positive impact on student attitudes toward community service and increase their motivation to focus on their studies. It may also boost their confidence in providing care to various groups of people in the community [8].

The lowest percentage for “Evaluate the effectiveness of the dental health program” was due to the limited opportunity to assess the community programs after their implementation. Some types of dental health programs take time to fully assess their effectiveness, which might no longer be possible for students to re-assess given the limitations of future engagements with the beneficiaries. However, the students were able to put the identified dental health program into action and recorded the dental health program implementation and evaluation. Students were also encouraged to perform impact studies on the dental health program's overall success. Students’ perspective on charity giving has an impact on their careers after graduation. Volunteering has helped them develop in their professions and postgraduate aspirations for a variety of reasons [9].

Figure 4 presents Student Outcome D: Ability to recognize the need to engage in lifelong learning. Based on the results, performance indicator 5: Appreciate the need for developing specialization got the highest percentage of 87.5, and performance indicator 1: Attend/participate in seminars and conferences, educational tours, and field trips got the lowest percentage of 82.9. This means that the performance target of 81 percent was achieved in all performance indicators for student outcome D.

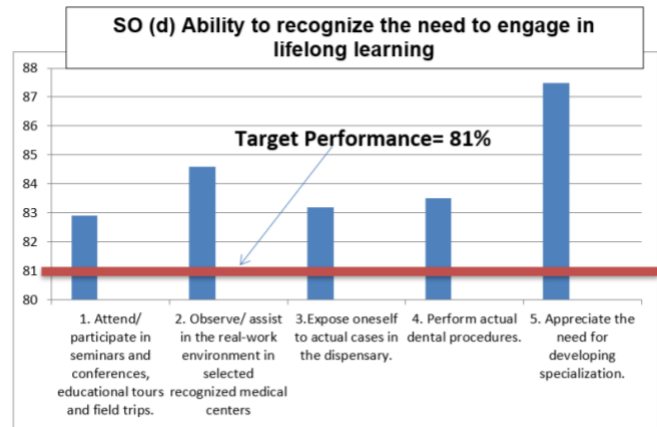


Fig. 4. Student Outcome (d).

“Appreciate the need for developing specialization” has the highest percentage because students are being introduced well to the major branches of dentistry, which can be further studied upon graduation. Seminars and exposure to various dental specializations are also being offered to the students during their collegiate years. The faculty members are also from various specializations in dentistry and interacting with them gives opportunities for students to appreciate different branches they may be interested in. Career and specialty orientation are necessary, particularly among final-year dental students, in encouraging them in selecting their future specialties while considering the needs and expectations of the community [10].

“Attend/ participate in seminars and conferences, educational tours and field trips” got the lowest percentage because of the constraints on the time and availability of students to join these activities, given the rigors and high demands of clinical training and academic requirements during their final years. Educational tours and field trips are also seldom done since all of the clinical cases are performed within the confines of the dental dispensary of the university. Attending these activities is beneficial to students, faculty, and dental practitioners and must be promoted early in dental training [11, 12].

Figure 5 presents Student Outcome E: Ability to participate in relevant research for the advancement of the dental profession. Based on the results, performance indicators 1 (Participate in the preparation of the research proposal), 3 (Conduct research study), and 5 (Disseminate research output) all got the highest percentage of 89.1, and performance indicator 2 (Identify oral health related problem as a subject for research) and 4 (Recommend improvement in the dental health status) got the lowest percentage of 85.4.



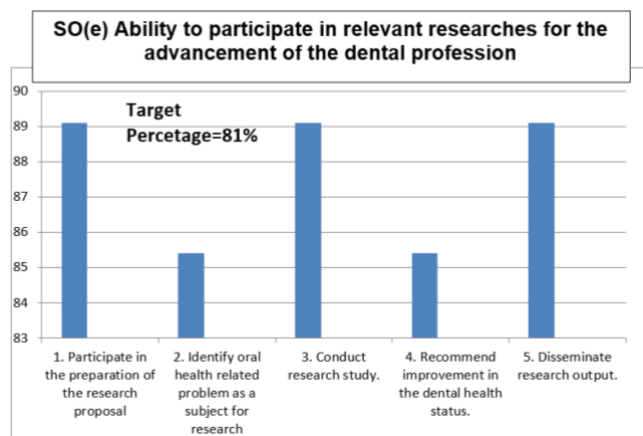


Fig. 5. Student Outcome (e).

This means that the performance target of 81 percent was achieved in all performance indicators for student outcome E.

The highest percentage was observed among students being able to “Participate in the preparation of the research proposal”, “Conduct research study” and “Disseminate research output” because the students were guided well during their thesis making and given ample time to formulate, defend and implement their research methods during their last two years in dentistry. Students were also invited to present their research findings to various platforms and research forums where the university is engaged in.

In a study by Abdulrahman et al. [13], dental students possessed a fair amount of understanding of scientific research, with the majority of them expressing a good attitude toward scientific study in general. Many of them were involved in research (making proposals or collecting data), but the vast majority of them did not write or submit articles for publication.

“Identify the oral health-related problem as a subject for research” and “Recommend improvement in the dental health status” got the lowest percentage due to the students’ struggle to investigate the current problems and research gap in the field of dentistry and formulate recommendations to enhance oral health. These skills would need adequate supervision and guidance, as well as time for further and deeper exploration of the research topics. Limited resources, curriculum overload, experience, finding related literature, and obtaining a topic or mentor are some of the barriers to dentistry students participating in research [13, 14].

Figure 6 presents the Student Outcome F: Ability to understand and adhere with the Code of Dental Ethics and apply the principles of jurisprudence in the practice of the profession.

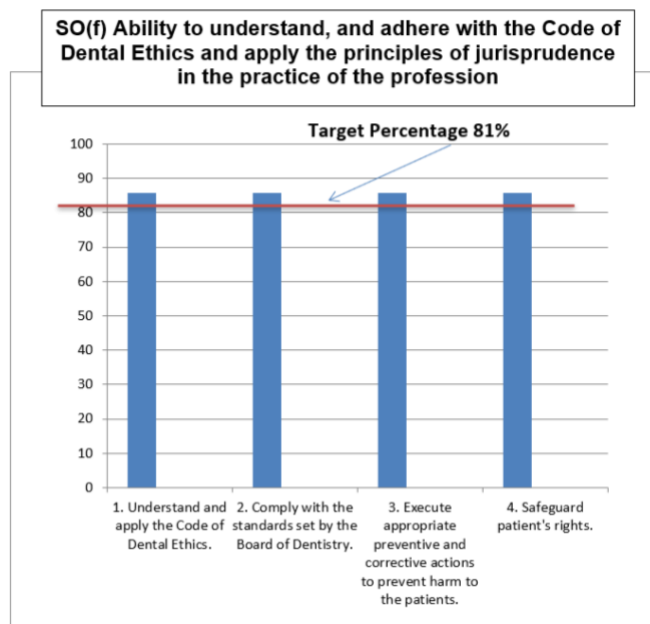


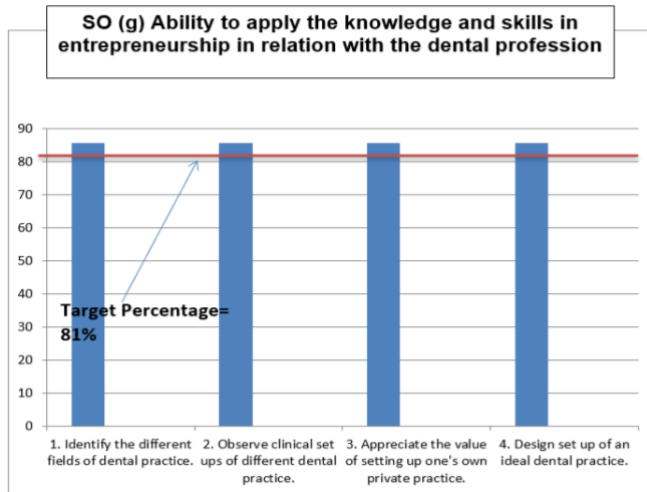
Fig. 6. Student Outcome (f).

Based on the results, all four performance indicators got a percentage of 85.8. This means that the performance target of 81 percent was achieved in all performance indicators for student outcome F.

All four performance indicators hit the target because the students were able to understand and follow the Dental Code of Ethics as this is inculcated well in the curriculum. They were aware so they can follow the Board of Dentistry's rules and regulations. To avoid injury to patients, students take the necessary preventative and corrective actions while treating them in the university dental dispensary, and with the guidance of their clinical instructors. Students ensure that their patient is informed of all the procedures, risks, benefits, and rights through patient waiver and informed consent, which their clinical instructor regularly monitor.

To ensure professionalism and a code of ethics implemented in the clinic, new clinicians also take an oath to pledge an honor code they will observe as they engage with their patients, collaborate with their peers and learn under the supervision of their instructors.

According to Raman and Ramlogan [15], academic integrity was more understood and appreciated once a certain honor code was implemented among dental students as they engage with their patients during their clinical training. In contrast, the employment of supporting innovative instructional strategies on academic integrity made the honor code implementation more effective.



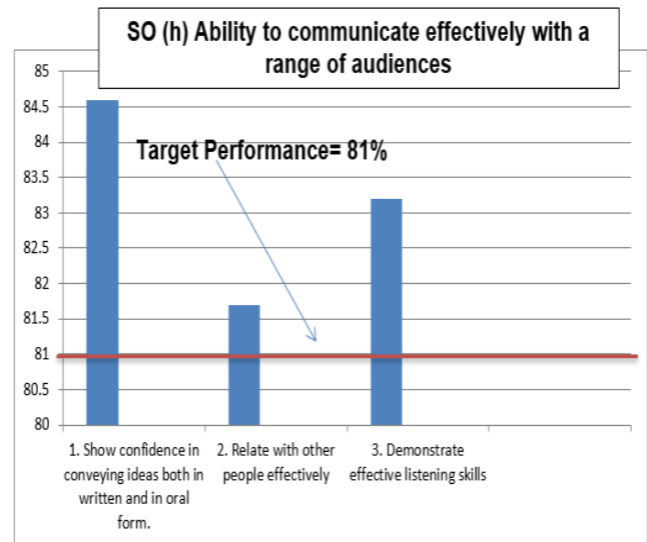
**Fig. 7. Student Outcome (g).**

Figure 7 presents the Student Outcome G: Ability to apply the knowledge and skills in entrepreneurship in relation to the dental profession. Based on the results, all four performance indicators got a percentage of 85.7. This means that the performance target of 81 percent was achieved in all performance indicators for student outcome G.

All four performance indicators hit the target because the students were able to incorporate entrepreneurship knowledge and skills in the dental profession. They familiarize themselves with the various types of the dental practice, as they discuss this in their courses for dental history and orientation, in addition to their interaction with their clinical instructors with experience in many types of dental practices.

Students were also able to examine the clinical setups of several dentistry practices and understand the importance of establishing one's private practice, as they learn these from practice management. They were able to create their model of perfect dental practice, envisioning for themselves their own dental clinic and system in their future career. A practice management course, according to the majority of dentists, is necessary for building a successful dental practice. To ensure evidence-based practices, the planning and delivery of practice management courses should be based on feedback from dentists [16].

Figure 8 presents the Student Outcome H: Ability to communicate effectively with a range of audiences. Based on the results, performance indicator 1: Show confidence in conveying ideas both in written and in oral form got 84.6% followed by performance indicator 3: Demonstrate effective listening skills with 83.2%



**Fig. 8. Student Outcome (h).**

Lastly, performance indicator 2: Relate with other people effectively got the lowest percentage of 81.7. This means that the performance target of 81 percent was achieved in all performance indicators for student outcome H.

“Show confidence in conveying ideas both in written and in the oral form” as the highest percentage indicates that students can communicate well in both written and verbal means, which is important as they constantly interact with their patients, peers, and clinical instructors. A good dentist-patient rapport and communication are important in providing quality dental service, and this skill is integral to a successful dental practice [17, 18, 19].

“Relate with other people effectively” ranked lowest due to the difficulty of students relating to A variety of patients with different personalities, temperaments, expectations, and levels of cooperation. A positive connection between dentist and patient benefits patient's dental health [20] so students must be trained to communicate effectively to establish and maintain such relationship despite conflicts and difficulties that may arise.

Figure 9 presents the Student Outcome I: Pass the board exam. Based on the results, performance indicator 3: Take and pass the oral revalida got 86.5% followed by performance indicator 2: Take and pass the final proficiency examination with 83.5% and lastly, performance indicator 1: Take and pass the written proficiency examination got the lowest percentage of 81.5.

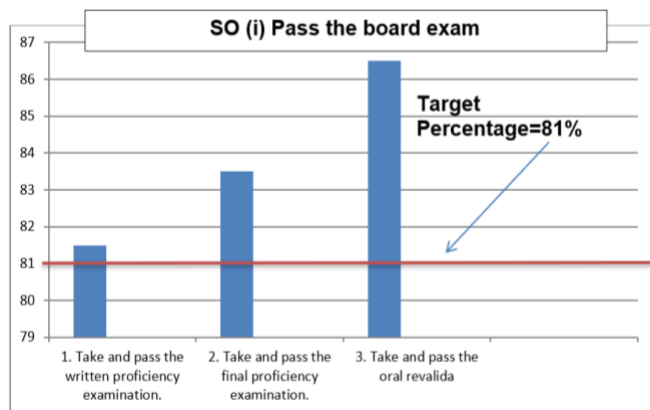


Fig. 9. Student Outcome (i).

This means that the performance target of 81 percent was achieved in all performance indicators for student outcome I. On the highest percentage, to “take and pass the oral revalida” is significant for students to measure that they have fully comprehended and can apply the clinical skills in dentistry.

In oral revalida, the panel of experts scrutinizes the process of how a student assesses, diagnose, treats, and evaluates the success of the intervention given to a patient. Performing well in oral revalida helps the students become ready and independent in managing dental cases of patients. In the United Kingdom and Ireland, dental regulatory agencies require dentists to

graduate with the knowledge, abilities, and traits necessary to practice safely and independently. Contemporary clinical dentistry skills education produces new graduates with great theoretical knowledge, who are prepared and competent in basic clinical abilities, but lack experience with complex treatments, perhaps limiting their readiness for independent practice [21].

“Take and pass the written proficiency examination” got the lowest percentage due to the difficulty experienced by the students to achieve high scores in all the written examinations covering all major subjects of the board exam. Preparing well for WPE entails a lot of hard work, established early on in the collegiate years where basic medical and dental courses are being studied so that these will give students a good foundation for the more complex dental specialization in the higher years. Reviewing for such a comprehensive examination takes a lot of effort and time, to cover the entire study of general dentistry.

Oftentimes, students felt anxious caused of a lack of test preparation, discomfort with the testing scenario, or inadequacy of test-taking abilities. Students who are anxious about examinations have negative sentiments of fear, vulnerability, and failure, which can lead to poor performance because of the incapacitating effects that examinations have on them [22].

Table 1. Proposed Action Plan for Improvement

KRA/ OBJECTIVES	STRATEGIES	DESIRED OUTCOME
SO (a) Ability to apply knowledge and technical skills in different clinical situations in the actual dental clinic	<ul style="list-style-type: none"> <li>Exposure of students to various diagnostic tools used in the dental settings during their pre-clinical years</li> <li>Role-playing of patient education and post-operative instructions in clinical cases where patient interaction is restricted.</li> </ul>	<ul style="list-style-type: none"> <li>Students will be familiar with the appropriate use and indications of diagnostic tools, and keen to utilize them for clinical cases.</li> <li>Students will be able to provide sufficient patient education and promote oral health literacy in different dental cases.</li> </ul>
SO (b) Ability to actively participate/work with other health professionals in the management and treatment of a patient	<ul style="list-style-type: none"> <li>Exposure of faculty and students to interprofessional conferences and training</li> </ul>	<ul style="list-style-type: none"> <li>Students will be increasingly aware of the various medical and health professions relevant to dental treatment and the promotion of oral health.</li> </ul>
SO (c) Ability to initiate and perform the basic dental health care services in the community	<ul style="list-style-type: none"> <li>Provide a safe and collaborative environment where students may voice out and share their views in evaluating the dental health program of the college</li> </ul>	<ul style="list-style-type: none"> <li>Students will be able to assess and suggest ideas for the improvement of dental health programs.</li> </ul>

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SO (d) Ability to recognize the need to engage in lifelong learning.	<ul style="list-style-type: none"> <li>• Offer students with opportunities to participate in international conferences and seminars</li> </ul>	<ul style="list-style-type: none"> <li>• Students will have wider exposure and engagement with organizations for career development and continuing education.</li> </ul>
SO (e) Ability to participate in relevant researches for the advancement of the dental profession	<ul style="list-style-type: none"> <li>• Conduct brainstorming and training opportunities for students to discover research gaps and problems in dentistry</li> <li>• Explore various research methods and guide students in producing research that will enhance the dental health status of the population</li> </ul>	<ul style="list-style-type: none"> <li>• Students will be able to propose research topics that are highly relevant and innovative in addressing current dental problems</li> <li>• Students will be able to present and utilize research addressing oral health problems and enhancing the overall oral health status</li> </ul>
SO (f) Ability to understand, and adhere to the Code of Dental Ethics and apply the principles of jurisprudence in the practice of the profession	<ul style="list-style-type: none"> <li>• Assess and establish honor code as applied in the college, especially in clinical dentistry</li> </ul>	<ul style="list-style-type: none"> <li>• The student will be able to demonstrate good working ethics and self-discipline as they treat and engage patients in the dental dispensary, as they work with their peers and clinical instructors</li> </ul>
SO (g) Ability to apply the knowledge and skills in entrepreneurship concerning the dental profession	<ul style="list-style-type: none"> <li>• Provide opportunities for students to engage with dental specialists and experts in the field of entrepreneurship</li> </ul>	<ul style="list-style-type: none"> <li>• Students will be able to plan for their future dental practice and will have a vision for their ideal dental practice</li> </ul>
SO (h) Ability to communicate effectively with a range of audiences	<ul style="list-style-type: none"> <li>• Increase engagement, collaboration, and feedback among their peers, professors, clinical instructors, and patients</li> </ul>	<ul style="list-style-type: none"> <li>• Students will have confidence and competence in expressing themselves and promoting good communication and rapport with colleagues and patients</li> </ul>
SO (i) Pass the board exam	<ul style="list-style-type: none"> <li>• Conduct review sessions and mentoring for students prior to proficiency examinations and board exam</li> </ul>	<ul style="list-style-type: none"> <li>• Students will be confident and excel in the dentistry licensure exam</li> </ul>

**CONCLUSION AND RECOMMENDATION**

The results revealed that all the student outcomes for the Dentistry program for Batch 2019 met and surpassed the target of 81%. Dental schools may seek opportunities to collaborate with international local dental and medical health organizations in providing adequate interprofessional collaboration and career development. Dentistry students may be involved in community dental health programs and college community extension activities to enhance communication skills, critical thinking skills, and collaboration with a wide range of people. Faculty and Staff may be involved in intensive training and exposed to international conferences and workshops to be effective in their teaching strategies and mentoring students in various specialties of dentistry.

Adequate feedback, collaboration, and coaching may be offered to dental clinicians especially in carrying out clinical cases in the dental dispensary. Faculty and students may be trained and exposed to research training and international forums to increase awareness of the current dental health challenges, best practices, and innovations. A culture of collaboration and open communication may be promoted among the administration, faculty, and students to address any pressing needs and challenges amidst the changing times and restrictions brought about by the pandemic. Increased awareness and cooperation among stakeholders are essential to overcome difficulties and make the most of the opportunities in the new normal.



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