Asian Journal of Education and Social Studies

8(1): 1-7, 2020; Article no.AJESS.57344
ISSN: 2581-6268

Creativity in Relation to Academic and Clinical Performance of Dentistry Students

Timothy Chifamba[1*] and Christian Wijaya[1]

[1]Adventist University of the Philippines, 4118 PutingKahoy, Silang, Cavite, Philippines.

Authors' contributions

This work was carried out in collaboration between all authors. Authors TC and CW designed the study, managed the literature searches, performed the statistical analysis, wrote the protocol and managed the analyses of the study. Author TC wrote the first draft of the manuscript. Both authors read and approved the final manuscript.

Article Information

DOI:10.9734/AJESS/2020/v8i130209
Editor(s):
(1) Dr. E. Seda Koc, Namık Kemal University, Turkey.
Reviewers:
(1) P. Moodley, South Africa.
(2) Tarulatha R. Shyagali, Madhya Pradesh Medical Science University, India.
Complete Peer review History: http://www.sdiarticle4.com/review-history/57344

Original Research Article

Received 10 March 2020
Accepted 16 May 2020
Published 26 May 2020

ABSTRACT

Aims: This study sought to identify the level of creativity of dentistry students, to determine if there is a relationship between creativity and academic performance of dentistry students, and to determine if there is a relationship between creativity and clinical performance of dentistry students.
Study Design: Descriptive-Correlation Cross-sectional Study.
Place and Duration of Study: Adventist University of the Philippines College of Dentistry, between May 2015 and April 2016.
Methodology: Questionnaires were used to measure the level of creativity of Dentistry students from the Adventist University of the Philippines then correlations were done with academic and clinical performance. Participation was voluntary and we included 50 of the 63 students enrolled int the clinical phase of the dentistry program.
Results: There was no significant relationship found at the 0.05 level (2-tailed) between both Big C and small C creativity and academic performance of all clinicians with pearson correlation coefficients of -0.053 and -0.003 respectively. There was no significant relationship found at the 0.05 level (2-tailed) between the Big C and the small C creativity and clinical performance of all clinicians, with Pearson correlation coefficients of -0.192 and -0.042 respectively.

**Corresponding author: Email: tchifg@gmail.com*;

Conclusion: The findings reveal that the creativity of dentistry students is below average. They also suggest that both Big C and small C creativity are not significantly relatedto academic or clinical success in dental school. The researchers recommend further study with modified methodology.

Keywords: Creativity; academic performance; dentistry students; clinical performance.

1. INTRODUCTION

Dentistry is considered as both a science and art. The student of dentistry faces the challenge of integrating and combining ideas based on both theoretical and technical knowledge and applying them to practical situations which often present in unique variations. It is widely agreed that creativity is an attribute of a good dentist. However, the question remains, what level of creativity is required for one to succeed in dental school and how significant is creativity to the success of one as a dental student both academically and clinically? Traditionally academic and clinical performance of students entering the dentistry proper program has been predicted by manual dexterity exams, intelligence scores, past academic performance and interview by college faculty. Throughout the program the student is evaluated mostly by Grade Point Average (GPA) or in clinical level one can be evaluated by his quantity and quality of performance of the clinical requirements.

Kaufman [1] argued creativity can be categorized into “Big C” and “little c.” These two types of creativity are often referred to as eminent creativity and everyday creativity. Little-c or everyday creativity includes routine problem-solving tasks and the ability to adapt to change. Big-C or eminent creativity occurs when an individual creates the extra-ordinary and affects an entire domain of knowledge or how people feel and live their lives. To a large extent, the creative process is affected by how much restriction comes from the environment towards the individual [2]. While scientists are taught to conform to the scientific process of reasoning, artists are encouraged to think outside the box, without restraint.In the Philippines, the education system stresses the executive thinking. This trains students to be overly-concerned with the proper implementation of tasks within a set of guidelines at the expense of creative and critical thinking Bernardo, Zhang & Callueng [3]. Students are bound by specific set of formulas or guidelines where doing the tasks or solving a problem without using the formulas or guidelines would be less acceptable.

“Patients and diseases do not come as prepackaged widgets. A slavish approach to standardized treatments without any creativity can do more harm than good.” How to bring everyday creativity into the delivery of health care should be a question the medical profession, should take seriously Kelly [4]. Working with human beings means students and tutors have to be able to be adaptable to the likes, dislikes, different personalities, beliefs and cultures of all with whom they come in contact. To be able to adapt involves a willingness to be creative. Creativity is involved in interpreting the patient's narrative and helping them rewrite the narrative, as it were; and in the use of metaphor and analogy in trying to explain phenomena to patients Jackson [5].

While the researchers believed that many factors influenced the academic [6,7] and clinical performance of dentistry students [8,9], the purpose of the study was to determine the extent to which creativity influences the academic and clinical performance of dental students. It also aimed to check if creativity is a major determinant of academic and clinical performance of dentistry students.

2. STATEMENT OF THE PROBLEM

There is a growing concern among educators regarding the decline in academic preparation and performance of tertiary students, especially male students Marrs and Singler [10]. Dental students’ clinical performance has been demonstrated to be significantly lower when compared to their pre-clinical performance Velayo et al. [11]. Total cognitive creativity has been linked with academic achievement Kaboodi and Jiar [12] and Atkinson [13]. On the contrary, a negative correlation between creativity and academic achievement has been found where anomaly in the school curriculum or possibly an anomaly with the method of course delivery exist Olatoye et al. [14].

Ideally, dentists exercise creativity in their daily work when performing activities like carving or sculpting. In addition, clinical presentations

present opportunities where creativity is required for problem solving American Dental Education Association [15]. The researchers, therefore, sought to determine if creativity is significantly linked to academic and clinical performance of dental students.

3. METHODOLOGY

The study utilized the descriptive-correlation cross-sectional method of research design. The purposive sampling technique was employed with all students who were enrolled in the clinical phase of the program being invited to participate. There was a total of sixty-three students enrolled in the clinical phase of the AUP dentistry program and fifty students were willing to participate. Twenty of the participants were male and thirty of the participants were female. Participants ranged from the age twenty to twenty-eight.

The researchers used a self-constructed closed ended questionnaire. The questionnaire was constructed based on extensive review of literature on Creativity, it was subjected to review by seven university psychologists and educationists. The questionnaire was closed ended, it did not have a section for open-ended comments or response. It consisted of fifteen items on Big C creativity and fifteen items pertaining to Small c creativity on a five-point Likert scale (See Appendix A).

Permission was sought from the Dean of the College to conduct the research. Participants were given informed consent forms to sign prior to participation. Academic Performance was measured based on the Grade Point Average (GPA); this information was obtained from the Dean's Office upon consent of the participants. Clinical Performance was computed based on the quantity and quality of clinical requirements achieved by clinicians. The identities of participants were protected by the use of ID numbers in the stead of names.

The data was entered into SPSS, then descriptive statistical tools were used in the analysis of academic performance and Clinical performance. Pearson's Correlative analysis was performed to determine the relationship between level of Creativity and Academic Performance and the relationship between level of Creativity and Clinical Performance.

4. RESULTS

4.1 The Level of Creativity ("big C" & "small c") of AUP Dentistry Students

Table 1 shows the mean level of Small C and Big C creativity which is 3.2503 and 1.9784 respectively. Based on the mean scores of items answered on a five-point likert scale, creativity was graded into very low, below average, average, high and very high (Table 2). By use of this scale, the dentistry students possessed an Average level of everyday creativity (small C creativity) and a below average level of eminent creativity (big C creativity).

4.2 The Relationship Between Creativity and Academic Performance

Table 3 shows the relationship between creativity and academic performance for all respondents. There is no significant relationship found between Big C and small creativity and academic performance of the AUP dental students.

Table 1. The level of creativity ("big C" & "small c") of AUP dental students

	Mean	Std. Deviation	Verbal interpretation
Small C Creativity	3.2503	.49093	Average
Big C Creativity	1.9784	.47041	Below Average

Table 2. Level of creativity scoring

Score	Verbal Interpretation
1-1.5	Very low
1.6-2.5	Below Average
2.6-3.5	Average
3.6-4.5	High

Table 3. The relationship between creativity and academic performance, correlation coefficients

	Academic Performance (GPA)	Verbal Interpretation
Big C Creativity	-.066	No significant relationship
Small C creativity	.082	No significant relationship

Table 4. The relationship between creativity and clinical performance, correlation coefficients

	Prosthodontics	Restorative Dentistry	Oral Medicine	Overall Performance	Verbal Interpretation
Big C Creativity	-.141	-.167	-.221	-.192	No significant relationship
Small C creativity	-.057	.015	-.069	-.042	No significant relationship

4.3 The Relationship Between Creativity and Clinical Performance

Table 4 shows the relationship between creativity and clinical performance. There is no significant relationship between everyday creativity (small C creativity) and eminent creativity (Big C creativity) and the major departments of clinical dentistry: Prosthodontics restorative dentistry, and oral medicine. There was also no significant relationship between everyday creativity (small C creativity) and eminent creativity (big C creativity) and the overall clinical performance of the students.

5. DISCUSSION

The findings may be surprising as for years it has been alluded that creativity is needed in the study and practice of dentistry [16]. However, one may note, that the study was not without it's limitations and delimitations. Due to budget constraints the study included students from only one of the twenty-five recognized colleges of dentistry within the Philippines. In addition, of the sixty-three clinicians enrolled, thirteen declined to participate further limiting the sample size. The questionnaire used to measure creativity was a self-constructed and not a standardized creativity test. It was close-ended and did not have any open-ended questions and there was no room for comments from the participants, no other methods were used to collect data other the questionnaire. While self-reporting measures of creativity are often the most convenient for researchers to use, they are limited to describing the self-perception an individual has towards how creative they are; therefore, these measures are best used when a study assesses how individuals feel about how creative they are or about how a determinant influences how creative they feel about themselves Kaufman [17].

The dental students possessed below average Big C creativity and average little C creativity. This average to low level of creativity can be attributed to the environment of the pre-clinical years of dental school which place emphasis on accuracy and a thorough methodical approach in order to qualify for the clinical phase. This could be due to the beliefs often held by instructors within the sciences, that scientific rules are absolute Alsahou & Alsammari [18] and given the heavy pre-clinical curriculum, it is possible that there is no room for students to go through the scientific process from hypothesis to forming theories and reaching at a conclusion.

The academic performance was measured through grade point average. A meta-analysis on the relationship between creativity and academic achievement conducted by Gadja et al. [19] showed that studies that demonstrated a stronger relationship between the creativity and academic performance utilized standardized creativity tests and not self-report measures. Furthermore, this relation was further highlighted when academic achievement was measured using standardized tests and not the grade point average. The findings of no significant relationship between creativity and clinical performance are supported by Simonton [20] who argues that formal education may not always have a positive correlation with creativity, and that in certain circumstances the association may not exist or be negative. The finding of a lack of a significant relationship could be due to the structured curriculum which emphasis on conforming to procedural standards. This could

lead to self-oriented perfectionism among dentistry students Wong et al. [21], which can restrict creativity Nordin-Bates [22].

6. CONCLUSION

The study found that creativity was below average among dentistry students, it also found that creativity was not directly related to academic and clinical performance of dentistry students. The researchers recommend that dental science educators promote creativity in the various basic and medical sciences classes to cultivate higher levels of everyday creativity (small C) and eminent creativity (Big C). The researchers also recommend further studies to be conducted with (i) the use of a larger sample size selected by randomization from a broader scope of colleges of dentistry within the Philippines and internationally, (ii) the use of non-self-reporting creativity measures be employed in future related studies, (iii) the use of standardized academic achievement tests be used in the stead of grade point average, and (iv) the combination of both quantitative and qualitative methods with the triangulation of data from students, lecturers and clinical instructors for a more accurate picture of academic and clinical performance of dental students.

CONSENT

This information was obtained from the Dean's Office upon consent of the participants

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Kaufman JC, Baer J. (Eds.). Creativity and reason in cognitive development. Cambridge: Cambridge University Press Kaufman, Plucker, & Baer; 2007.
2. Hunt N, Marshall K. Exceptional children and youth (5th ed.). Los Angeles: Cengage Learning; 2013.
3. Bernardo, Allan BI, Li-Fang Zhang, Carmelo M. Callueng. Thinking styles and academic achievement among Filipino Students. The Journal of Genetic Psychology. 2002;163(2):149-163.
4. Kelly N. New solutions for a new age: medicine - SRQ Daily; 2019. [online] Available:Srqmagazine.com. Available:https://www.srqmagazine.com/srq-daily/2019-12-28/12288_New-Solutions-For-A-New-Age-Medicine [Accessed 13 Feb. 2020]
5. Jackson N. Creativity in medicine and medical education. Higher Education Academy. United Kingdom; 2005.
6. Kaufman, Plucker. Intelligence and creativity in Sternberg R., Kaufman S. editors. The Cambridge Handbook of Intelligence. Cambridge University Press; Cambridge; 2011.
7. Kyoshaba. Factors affecting academic performance of undergraduate students at Uganda Christian University, Makerere University; 2009.
8. Tichiwanhuyi TG. The relationship between personality and clinical performance among AUP-COD clinicians in 2013-2014 (Unpublished thesis). Adventist University of the Philippines, Silang, Cavite, Philippines. University of Gothenburg. Declining school performance explained. Science Daily ; 2014. Retrieved April 4, 2016 Available:www.sciencedaily.com/releases/2010/02/100215100519.htm
9. Walid S. Significance of primary factors influencing students' performance at College of Dentistry, King Saud University, Saudi Arabia [online] Journal of Pakistan Medical Association; 2012. Available:http://jpma.org.pk/fullarticle_text.php?article_id=3614 [Accessed 4 Apr. 2016]
10. Marrs H, Sigler E. Male academic performance in college: The possible role of study strategies. Psychology of Men and Masculinity. 2012;12(2):227
11. Velayo BC, Stark PC, Eisen SE, Kugel G. Using dental students' preclinical performance as an indicator of clinical success. J Dent Educ. 2014;78(6):823-8. Pub Med PMID: 24882767.
12. Kaboodi M, Jiar Y. Cognitive and trait creativity in relation with academic achievement. International Journal Of Social Science And Humanity. 2013;391-395.
13. Atkinson S. Creativity: A handbook for Teachers (Review). Design and Technology Education: An International Journal. 2011;16(1). ISSN: 1360-1431.
14. Olatoye R, Akintunde S, Ogunsanya E. Relationship between creativity and

academic achievement of business administration students in South Western polytechnics, Nigeria. African Research Review, An International Multi-Disciplinary Journal, Ethiopia. 2015;4(3a):134-149.

15. American Dental Education Association Why be a dentist: GoDental; 2015. Retrieved 1 October 2015, Available:http://www.adea.org/GoDental/Dentistry_101/Why_be_a_ dentist_.aspx
16. Awori J. Do you want your doctor to be creative? | Doctors Who Create; 2015. Retrieved 1 October 2015 Available: Doctorswhocreate.com, http://www.doctorswhocreate.com/do-you-want-your-doctor-to-be-creative/
17. Kaufman J. Self-assessments of creativity: Not ideal, but better than you think. Psychology of aesthetics, creativity, and the arts. 2019;13(2):187-192. Available:https://doi.org/10.1037/aca0000217
18. Alsahou H, Alsammari A. Beliefs about scientific creativity held by pre-service science Teachers in the State of Kuwait. International Education Studies. 2019;12(10):37. Available:https://doi.org/10.5539/ies.v12n10p37
19. Gadja A, Karwowski M, Beghetto R. Creativity and academic achievement: A meta-analysis. Journal Of Educational Psychology. 2017;109(2):269-299. Available:https://doi.org/http://dx.doi.org/10.1037/edu0000133
20. Simonton D. Big-C versus little-c creativity: Definitions, implications, and inherent educational contradictions. Creative Contradictions In Education. 2016;3-19. DOI:10.1007/978-3-319-21924-0_1
21. Wong R, Fadhulah Suhaimi N, Low M, Ahmad M, Thavachelvan R, Sakhnini Z, Ahmed Ali, S. Multidimensional perfectionism among medical, dental and optometry students at SEGi University, Malaysia. Journal of Educational, Health and Community Psychology. 2018;7(2):1. Available:https://doi.org/10.12928/jehcp.v7i1.8437
22. Nordin-Bates S. Striving for perfection or for creativity? 2019. Retrieved 14 May 2020 Available:https://doi.org/10.1080/15290824.2018.1546050

APPENDIX A – CREATIVITY ITEMS USED ON THE QUESTIONNAIRE

INSTRUCTIONS

To what extent would say that you experience or engage in the following activities?

(Please respond by circling the appropriate number. Note that there is no right or wrong answer; only what yousincerely believe to be true of you. Also, your response is highly confidential; hence, no name is required).

"Small c"	Always	Rarely	Some-times	Often	Never
1. I think I am a creative person					
2. My creativity is important for who I am					
3. I know I can efficiently solve even complicated problems					
4. I trust my creative abilities					
5. My imagination distinguishes me from my friends					
6. Many times I have proved that I can cope with difficult situations					
7. I have made cartoon drawings					

8. Being a creative person is important to me					
9. I am sure I can deal with problems requiring creative thinking					
10. I am good at proposing original solutions to problems					
11. I write poems					
12. Creativity is an important part of myself					
13. Ingenuity is a characteristic that is important to me					
14. I keep a sketch book (excluding school requirements) for drawing.					
15. I write short stories					

"Big C"	**Always**	**Rarely**	**Some-times**	**Often**	**Never**
1. My colleagues appreciate my artwork					
2. My colleagues recognize my proficiency in one or more musical instruments					
3. People perform an original piece of music I composed					
4. People have paid me to choreograph an original dance number					
5. I have sold an original architectural structure					
6. People find my original short stories interesting					
7. My writings have won an award or price					
8. People have often commented on my original sense of humor					
9. I have created jokes that are now regularly repeated by others					
10. People use original software that I created					
11. Others are amazed by the unique original uses for household objects that I find					
12. People appreciate my experiments with recipes.					
13. Others say I'm a good actor/ actress					
14. My professors think I come up with unique ways to solve scientific problems					
15. I have won a prize at a science fair local competition.					

Peer-review history:
The peer review history for this paper can be accessed here:
http://www.sdiarticle4.com/review-history/57344