Scientific Research Publishing

Open Journal of Social Sciences, 2020, 8, 51-61
https://www.scirp.org/journal/jss
ISSN Online: 2327-5960
ISSN Print: 2327-5952

Architectural Design Course: Performance Innovative Task Output Preference of 4th Year BS-Architecture Students of the University of Science and Technology of Southern Philippines, Cagayan de Oro

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How to cite this paper: Eltanal, R. M., & Avelino, R. T. (2020). Architectural Design Course: Performance Innovative Task Output Preference of 4th Year BS-Architecture Students of the University of Science and Technology of Southern Philippines, Cagayan de Oro. *Open Journal of Social Sciences, 8,* 51-61.
https://doi.org/10.4236/jss.2020.82005

Received: January 13, 2020
Accepted: February 17, 2020
Published: February 20, 2020

Abstract

In the first three years in the program architecture students are introduced to courses that will enhance manual drawing and technical skills through extensive exposure to manual drawing processes as requirement for a performance innovative task. As students move forward to the higher years in the program, they are introduced to computer based drawing courses to produce a computer generated performance innovative task until they reach the last part of the Architectural Design Course which is the thesis proposal and thesis presentation on their 5th year. Their five years or more stay in the program will equip them problem solving skills in the real practice of the architectural profession after they pass the state board exam using manual and 3D produced drawing requirements. Students and design instructors in the department are challenged to design an updated architectural design course syllabus and performance innovative task templates that will suit the present output preference specifically; purely manual drawing PIT, combination manual and 3D PIT with emphasis on purely 3D drawing PIT preferred by the students in their performance innovative task in the said course, with which an architecture student should be graded accordingly.

Keywords

Performance Innovative Task, Architectural Design Course, Architectural Output Preference and Architecture Students

1. Introduction

The Program Education Objectives (PEO's) of the Commission on Higher Education CMO No. 61, series of 2017 for Bachelor of Science in Architecture suggested to develop an outcome based education curriculum that performs standard competencies in accordance with the scope of the global and local practice of architecture. It also suggested aligning the thrust of architecture education to the needs and demands of society and its role in building social, economic, cultural and environmental aspects of the country. It promotes better comprehension of basic philosophy and principles of the multidimensional side of architecture and its relationship to man and the environment. With this, the USTP Department of Architecture; Architectural Design Course will provide the type of performance innovative task that fits the present day preference of architecture students to fully bring into development the said CHED Memorandum Order.

A review of the influences that affect architectural education in the USA has reached the highlight of recognizing sustainability in education. To show the need of sustainability, it needs to be integrated to the new curriculum and the question is how to achieve integration. Different approaches to introduce sustainability into the architectural program are proposed so that students will be equipped to solve real architectural problems in the actual field after their graduation like new drawing and editing software in the market and how to manipulate the said programs to produce a superior architectural design solution (Wright, 2003). New architectural presentation trends which are only found outside the school should be taken into consideration in the design of performance tasks inside the school so that students will acquire updated knowledge that they will be able to use during the practice of their courses by the time they graduate and pass the state licensure examination for architects.

The purpose and motivation of this study are to create a template of architectural design performance innovative tasks that emphasize design applications and building laws and regulations of complex and tall buildings; explain the relationship of architecture with the environment and ecology; design for the community with an understanding of the site development and planning and an architectural design task that clearly states the design concept and design philosophy translated that is suitable to the present trends and preference of architecture students for them to deliver a significant and exceptionally evident performance innovative task in this course.

2. Framework of the Study

In Figure 1, the general idea of the Architectural Design Course PIT preference is an independent factor with considerations of dependent elements namely; purely manual drawing PIT, purely 3D drawing PIT and combination manual and 3D PIT. Upon assessment of the given PIT of various types, the student preferences are determined by the grade outcomes based on the Rubrics of the course. With the students' performance being determined, actual Architectural

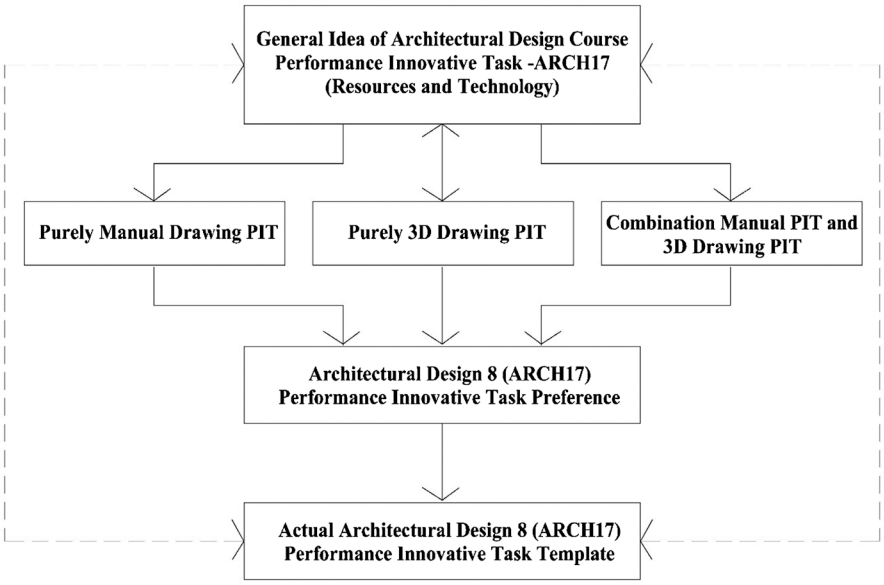

Figure 1. Conceptual framework of the architectural design 8 (ARCH17) performance innovative task preference of 4th year BS architecture students of USTP-CDO campus.

Design 8 (ARCH17) course PIT Template for the semester will be designed accordingly.

3. Objectives of the Study

This study is aimed to analyze the present day preference of the 4th Year BS Architecture students of the University of Science and Technology of Southern Philippines—Cagayan de Oro Campus in their Performance Innovative Task (PIT) output type in the course Architectural Design 8—ARCH17 with descriptive title Design of Complex Structures.

The specific objectives of the study are as follows;

1) Know the current performance innovative task preference of the students to understand the present day trend of the architectural design.

2) Understand the type of Performance Innovative Task that the students would become proficient in achieving the Course Outcomes (CO) as surveyed using the conduct of tools employed in the study.

3) Provide the actual Architectural Design 8—(ARCH17) Performance Innovative Task Templates as to the preference demand for use in the 4th Year BS Architecture students of the department that will encourage them to identify real-life opportunities to establish their future career paths.

4. Literature Review

This chapter provides analysis and evaluation of existing different strategies and techniques used in the field of architectural undergraduate education to come up with a system of PIT task type that enhances' the students ability to attain the prescribed course outcome of Architectural Design 8—ARCH17 (Design of Complex Structures). This literature starts with the development of an architec-

tural curriculum for a constantly developing and changing academic environment. The last part defines the sustainability of architecture schools' curriculum needed as to higher Architectural Design subjects to attain the Program Educational Objectives, three to five years after finishing the program. This section of the study provides the foundation and rationalization of the research.

Architectural Design Course Study of a changing Academic Environment

The architectural education environment is compelling to establish development and changes notwithstanding the important challenges it continues to face. The traditional methods of an efficient architectural pedagogy are now under question due to advancements in technology and outlook in design. The proposition is on how good we prepare the architecture students for a very challenging and focus on the chances from given issues in architecture to redefine the focal points after they graduate from the program. The study is required to conform to the current realities in the practice by contemplating and redesigning the teaching and learning relationships inside the school. Teaching should capture the moment of a critical momentum by analyzing what really is the object of architecture study by generating new approaches to deal with disharmony within and beyond the study of architectural design (Charalambous & Christou, 2016). To explore teaching through engages and active participation in practical-based learning in working drawings that uses new methods and tools beyond the traditional types of learning strategies in architectural knowledge production.

A decade ago, architectural education has an increasing number of digital technologies involved in the design studio curriculum. Following the trends of the architectural profession in the delivery of working drawings as emphasis. These programs and softwares are needed to be implemented in selected courses to compensate the learning outcomes as architecture students venture outside after a degree from the architecture school (Levent, 2014). The conventional architectural design approaches like manual drawing should not be argued in delivering fundamental level skills to architecture students and the digital drawing tools should be introduced after acquiring set of skills to deliver architectural design with digital and 3D tools.

It is geared to encourage architecture students to identify real-life opportunities to which they can answer confidently, rationally and creatively to improve to establish their future career paths as architects. In the changing world of architectural practice today, architecture schools are committed to produce graduates that are fully equipped with knowledge and skills to perform the professional services to the clients that they will serve. With these abovementioned factors concerning an efficient architectural design pedagogy the performance inside the school should not be left afar.

Current teaching and learning approaches in Architectural Design Course

A certain level of academic knowledge and skills complexity is required for architecture school instructors when entering a teaching path career. With these qualifications, an architecture student must be ready for the strenuous workload

of architectural design courses that one must face from the instructors in order to gain all necessary competence to perform architectural duties after earning the degree. Different implications for an architectural design course like the different teaching and learning strategies to produce a quality architectural design performance innovative task should be identified (Soliman, 2017). The level of difficulty of architectural design course in the architecture school varies form each year level and the fourth year level is considered to be the most difficult before one student can enrol the thesis course on the fifth year. On the fourth year architectural design course a student must possess knowledge and skills in his performance innovative task so he can pass the said course from an existing architectural design course pedagogy.

Following the trend of the profession, the architecture program in the previous years has seen an increasing number of digital based technology involved in the architectural design process. Various technologies of computer aided drawing and drafting, estimates and modelling and environmental analysis started to shape the architectural education to support and compensate the number of drawing software available in the architectural professional practice. (K. Levant, 2014). In this context it is realistic to conform and embrace in the use of digital technologies and tools in architectural education when the reflection in the past decade showed vast changes.

In this day, the conventional tools of manual hand drawing and physical site and building modelling should not be left behind since these are foundation levels of the architectural program. After acquiring these basic skills, then comes the introduction of digital tools to provide appropriate modern day digital skills for the real practice outside the architecture school.

5. Methodology

This chapter describes the research methodology used in the study. The institution and respondents of the survey where the study will be conducted, the research design and the population are described. The research instrument used to collect the data, including the methods implemented to maintain validity and reliability of the instrument are described.

Research Approach Design

A quantitative research approach and inquiry-based architectural pedagogy was used to describe the best approach prior to the conduct of the research survey during the start the first semester, School Year 2018-2019 of the 71 officially enrolled students in 4th Year Bachelor of Science in Architecture Program section 4A and 4B taking up Architectural Design 8 (ARCH17)—Design of Complex Structures 1 of the University of Science and Technology of Southern Philippines located in CM Recto Avenue, Lapasan Highway, Cagayan de Oro City, Philippines.

A comprehensive case study of the subject is used to seek facts and causes without regard of the individual under the study. The research will examine the

data from the survey conducted on the actual three (1. Purely 3D PIT, 2. Manual PIT and 3. Combination 3D and Manual PIT) Performance Innovative Task accumulated grades to come up with a proficient architectural design course pedagogy that will be used by the department for the program responsive to the present trend of the architectural profession outside the school. The PIT was individually given deadline within the duration of the semester at 52 hours each PIT equivalent to 1 month extensive research, checking and hands-on process.

The contents of the PIT are the following; 1) Site Development Plan, 2) Floor Plans, 3) Elevations, 4) Sections and 5) Concept Board. Scale of the requirements may vary to fit 20 × 30 size drawing paper. Each PIT is graded accordingly using the rubrics from the department as basis for the grades to be given to individual plates.

6. Results and Discussion

A survey was conducted using a questionnaire during the first part of the second semester of School Year 2018-2019 before the first performance innovative task was given to know how equip the 4th Year Bachelor of Science Architecture students to perform both manual and 3D drawings that will be assigned in the next days of the semester. The questionnaire has 4 parts; 1) Possession of basic manual drawing tools, 2) Desktop/Laptop Specification and Ownership, 3) 3D Drawing Software and Ability to Operate and 4) Performance Innovative Task preference according to individual aforementioned capacity.

The second part is the evaluation and analysis of the result grades from the 3 three Performance Innovative Tasks given; 1) purely manual drawing PIT, 2) purely 3D drawing PIT and 3) combination manual and 3D PIT in the entire semester to measure the skills and knowledge the architecture student possess to perform the tasks.

Possession of Manual and 3D Tools, Desktop/Laptop Ownership and Individual student PIT preference Survey Results

As shown in Figure 2, among the 71 students from BS Architecture sections

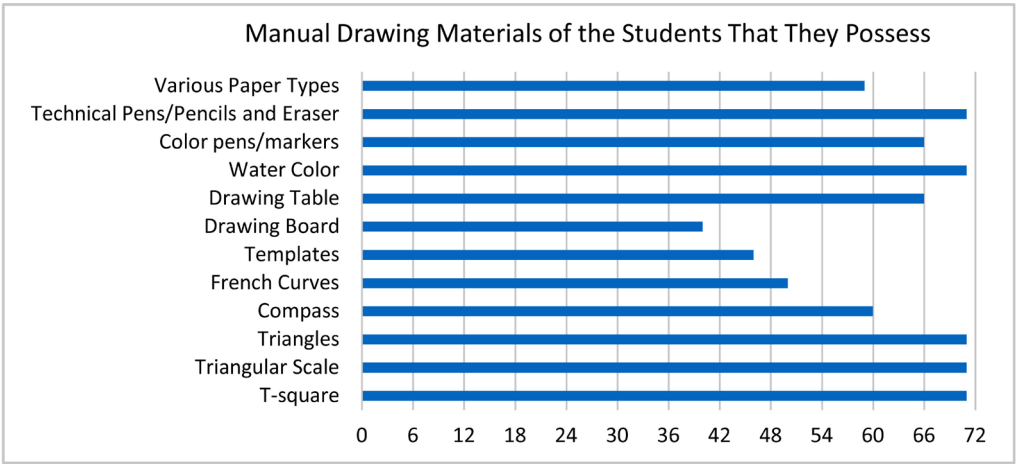

Figure 2. Possession of manual drawing materials and tools graph.

4A and AB enrolled in the Architectural Design 8 (ARCH17)—Design of Complex Structures 1, all held in possession basic manual drawing tools like the t-square, triangular scale, triangles (30 × 60 and 45 × 45), water color, technical pen, pencil, eraser and various paper types and around 67 students or 94% have special manual drawing tools like compass, French curves, furniture templates, drawing boards/table and architectural color markers and pens.

As shown in Figure 3, all students own either a desktop or a laptop computer. Processors of these desktops and laptops varies from AMD Ryzen, Core i3, Core i3-7th Gen, Core i5 and Core i7-8th Gen. 6 students or 8% responded to have a desktop or laptop graphics card namely; GTX 1070, GTX 1050, GTX 720, NVIDIA GEFORCE, AMD RADEON and Intel HD Graphics 630.

As shown in Figure 3, in the manipulation and use of 3D Drawing and Graphics related Computer Software all students responded to have in their desktop or laptop installed. These programs are Sketch Up 3D Design Software and AutoCAD, the basic drawing software of architects and designers. 49 students or 69% of the students have VRay Rendering Software, Adobe Photoshop Editing Software and Lumion Rendering Software are installed in their computers. Below 13% of the students use Enscape Rendering, Rivet 3D Models and Rhino SKP Extension as 3D modelling software.

As shown in Figure 4, In the first part of the semester the students where asked to choose their individual preference in the following performance innovative task namely; Purely 3D PIT, Manual PIT and Combination 3D and Manual PIT. 37% or 52% of the students responded to preferred Combination of Manual Drawing and 3D Produced Plate Output, while 31 students or 44%

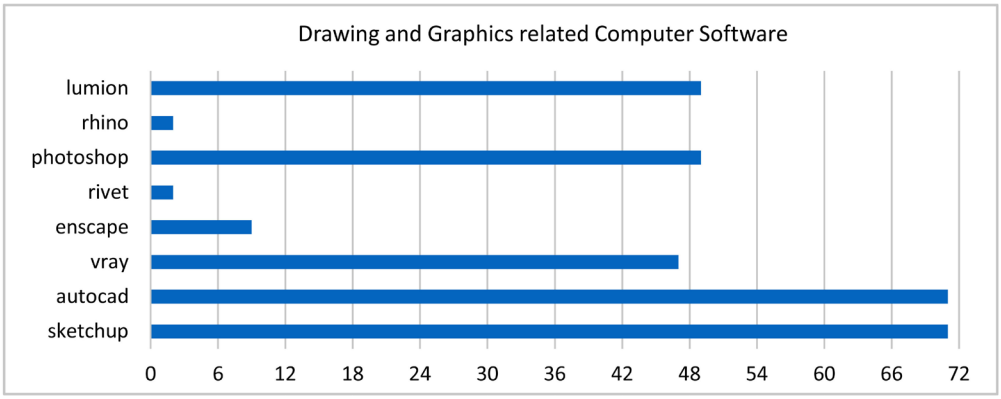

Figure 3. 3D drawing and graphics software manipulation and use graph.

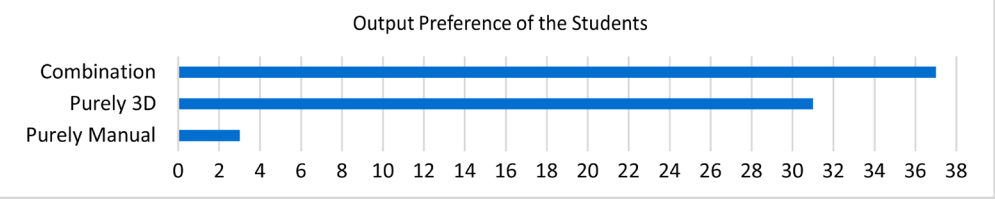

Figure 4. Preferred performance innovative task output graph of sections 4A and 4B BS architecture students of USTP—cagayan de oro campus.

preferred Purely 3D Produced Plate Output and 3 students or only 4% preferred the Purely Manual Drawing Plate Output.

The Performance Innovative Tasks of 4th Year BS-Architecture Students of USTP-CDO Result

The first Performance Innovative Task 1/Plate No.1 is entitled "Adaptive Re-Use of Paco Railway Station" which is purely 3D Drawing Performance Innovative Task in nature. Drawing requirements are as follows; concept board, site development plan, floor plans, elevations and sections. Time table for this plate is four (5) weeks at twelve (12) hours per week where a twelve (12) hour consultation period for the student's preliminary work and forty-eight (48) hours allotted to produce their final PIT output on the deadline that will be graded using the existing departmental rubrics for architectural design courses. Scoring criteria are as follows; 1) Concept Board at 10%, 2) Floor Plans at 20%, 3) Site Development Plan 30%, 4) Elevations at 10%, 5) Sections at 10% and 6) Perspectives at 20% with a total overall score of 100%.

The scores that the students obtained from the Purely 3D Drawing PIT is shown on Figure 5, where 21 students or 29.5% obtained 82-84 with numerical grade value of 2.25 as Above Average; 20 students or 28.0% obtained 79-81 with numerical grade value of 2.50 as Average; 1 student or 1.4% obtained 91-93 with numerical grade value of 1.50 as Very Good; while 6 students or 8.5% obtained 64 and below with numerical grade value of 5.0 as Failure. Mean score of grades obtained from the Purely 3D Drawing PIT is Σfx = 81.577 with numerical value of 2.5 as Above Average.

The second Performance Innovative Task 2/Plate No.2 is entitled "Laguindingan International Airport" which is Purely Manual Drawing Performance Innovative Task in nature. Drawing requirements are the same with plate no. 1. Scoring criteria are as follows; 1) Concept Board at 10%, 2) Floor Plans at 20%, 3) Site Development Plan 30%, 4) Elevations at 10%, 5) Sections at 10% and 6) Perspectives at 20% with a total overall score of 100%.

The scores that the students obtained from the Purely Manual Drawing PIT is shown on Figure 6, where 34 students or 47.80% obtained 64 below with numerical

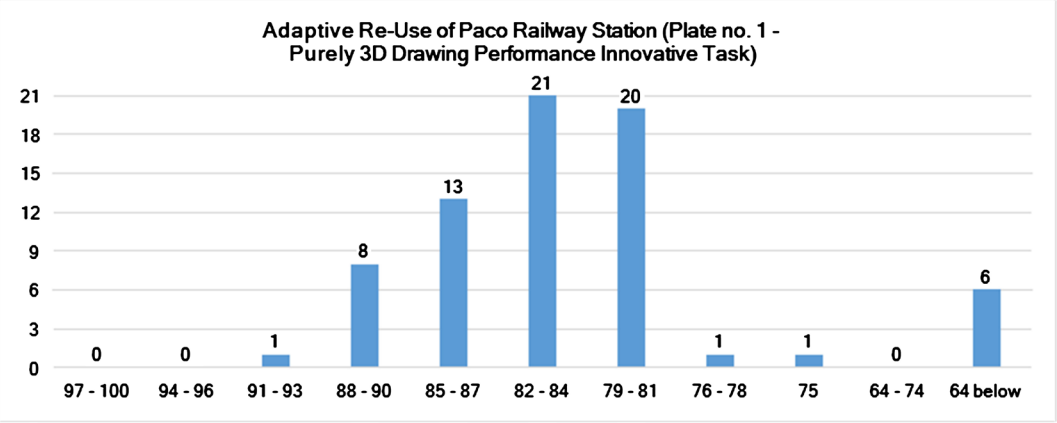

Figure 5. Purely 3D PIT Score of 71 students from the 4th Year BS-Architecture of USTP-CDO.

grade value of 5.00 as Failed; 23 students or 32.40% obtained 64 - 74 with numerical grade value of 3.25 as Conditional; and 3 students or 4.20% obtained 85 - 87 with numerical grade value of 2.00 as Above Average. Mean score of grades obtained from the Purely Manual Drawing PIT is $\Sigma fx = 68.268$ with numerical value of 3.75 as Failed.

The third Performance Innovative Task 2/Plate No.3 is entitled "The New Cagayan de Oro Sports Complex" which is a Combination Manual and 3D Drawing Performance Innovative Task in nature. Drawing requirements are the same with plate no. 1 and 2. Scoring criteria are as follows; 1) Concept Board at 10%, 2) Floor Plans at 20%, 3) Site Development Plan 30%, 4) Elevations at 10%, 5) Sections at 10% and 6) Perspectives at 20% with a total overall score of 100%.

The scores that the students obtained from the Combination Manual and 3D Drawing PIT is shown on the Figure 7, where 18 students or 25.35% obtained 79 - 81 with numerical grade value of 2.50 as Average; 17 students or 23.94% obtained 64 - 74 with numerical grade value of 3.25 as Conditional; and 10 students or 14.10% obtained 64 below with numerical grade value of 5.00 as Failed; 9 students or 12.70% obtained 82 - 84 and 85 - 87 with numerical grade value of 2.25 and 2.00 as Above Average; while 3 students or 4.22% obtained 88 - 90 with

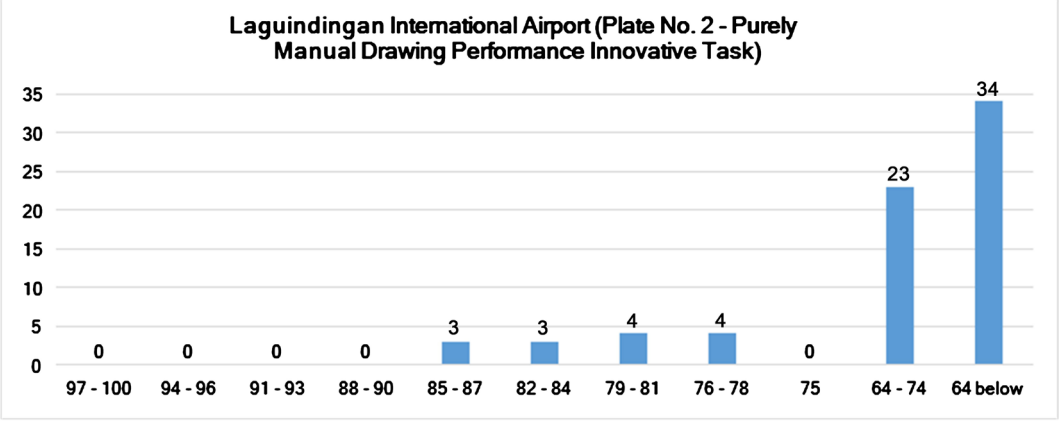

Figure 6. Purely Manual Drawing PIT Score of 71 students from the 4th Year BS-Architecture of USTP-CDO.

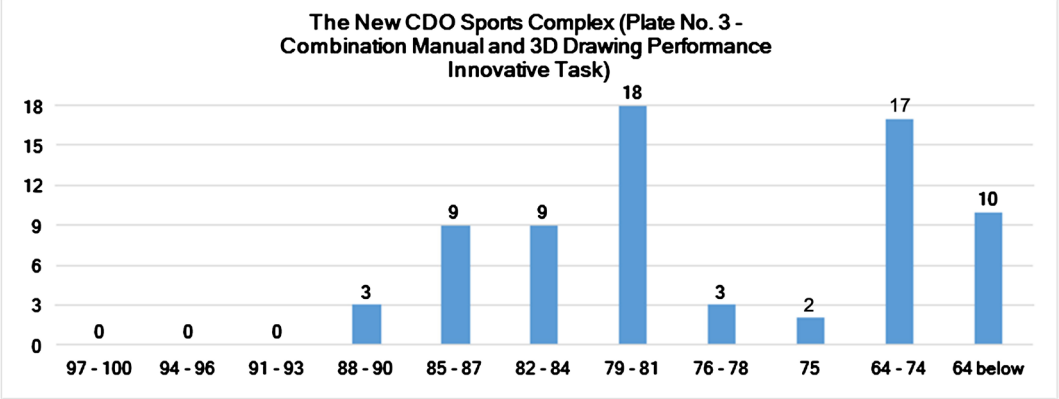

Figure 7. Combination Manual and 3D Drawing PIT Score of 71 students from the 4th Year BS-Architecture of USTP-CDO.

numerical grade value of 1.75 as Very Good. Mean score of grades obtained from the Purely Manual Drawing PIT is Σfx = 76.155 with numerical value of 2.75 as Passing.

7. Conclusions and Recommendations

This study identified three (3) Performance Innovative Task type specifically (Table 1); 1) Purely 3D PIT, 2) Manual PIT and 3) Combination 3D and Manual PIT to determine the PIT preference of 4th Year BS Architecture Students of USTP-CDO for them to perform well and meet the course outcomes (CO) and the objectives of the course Architectural Design 8 (ARCH17)—Design of Complex Structures 1.

From the result, it is clear that the Purely 3D Performance Innovative Task (PIT) is preferred by the 4th Year BS-Architecture students of USTP-CDO when the grades obtained from this plate have a mean score of Σfx = 81.577 with numerical value of 2.5 as Above Average compared to Purely Manual Drawing PIT with mean score of Σfx = 68.268 with numerical value of 3.75 as Failed and Combination Manual and 3D Drawing PIT with Σfx = 76.155 with numerical value of 2.75 as Passing. The grades obtained from the three (3) types of PIT mentioned followed the scoring criteria; 1) Concept Board at 10%, 2) Floor Plans at 20%, 3) Site Development Plan 30%, 4) Elevations at 10%, 5) Sections at 10% and 6) Perspectives at 20% with a total overall score of 100%.

This result is important in the preparation of actual and updated Architectural Design 8—(ARCH17) Performance Innovative Task Templates to be used in 4th Tear BS Architecture students of the department that will encourage the students to identify real-life opportunities to establish their future career paths when they graduate in the BS-Architecture Program.

Several other questions remain to be addressed like the interval of the next study because from time to time there are changes in the architectural design practice as well as present trends and updates of the state board exam, the Architecture Licensure Board Examination conducted twice every year. The extent of professional practice and exposure to the real environment of the instructors

Table 1. Performance Innovative Task Preference Results and Summary of the Survey conducted to 71 students of BS-Architecture for the 2nd Semester *of SY* 2018-2019 *in USTP-CDO.*

	Performance Innovative Task Type	Mean Score between 71 students of BS-Architecture USTP-CDO (Σfx)	Numerical Value	Description
1	Purely 3D Performance Innovative Task	81.577	2.50	Above Average
2	Purely Manual Performance innovative Task	68.268	3.75	Failed
3	Combination Manual and 3D Performance Innovative Task	76.155	2.75	Passing

in the department and the degree of frequency that instructors attend seminars and conferences for the improvement of the architectural education pedagogy techniques and capability also needs to be directed.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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