PEOPLE: International Journal of Social Sciences
ISSN 2454-5899

Alkhalidi &Izani, 2017

Volume 3 Issue 3, pp. 124-132

Date of Publication: 17th November 2017

DOI-https://dx.doi.org/10.20319/pijss.2017.32.124132

This paper can be cited as: Alkhalidi, A., & Izani, M. (2017). Assisting Interior Design Class Using Online 3D Application. PEOPLE: International Journal of Social Sciences, 3(3), 124-132.

ASSISTING INTERIOR DESIGN CLASS USING ONLINE 3D APPLICATION

Abdulsamad Alkhalidi
Assistant Professor, University of Sharjah, Sharjah, United Arab Emirates
aalkhalidi@sharjah.ac.ae

Mohammed Izani
Assistant Professor, Effat University, Jedda, Kingdom of Saudi Arabia
moabidin@effatuniversity.edu.sa

Abstract

Learning visual subject that involves creativity, technicality and drawing skills is very challenging, time consuming and sometimes very frustrating. It requires passion and patience in order to understand and master the skills. Our study focuses on implementing a method to assist the students in understanding visual subject particularly perspective drawing in interior architecture program at the College of Fine Arts and Design (CFAD), University of Sharjah. An online 3D application known as Autodesk Homestyler has been used to assist sophomore students to understand perspective drawings. The main problems for these students are difficulties in visualizing and understanding 3D space, scale, proportion and object depth in perspective drawing. Implementation of this method allows the students to understand the subject effectively. Samples of student work, before and after the implementation are shown to demonstrate the effectiveness of this

method. The result shows that traditional drawing skills that enhanced and aided by the technology such as online 3D application will give more result that is promising and this hybrid method has great potential for future development.

Keywords

3D Application, Interior Architecture, Homestyler, Visual subject, Perspective Drawing, Universal Design

1. Introduction

This paper discusses about the experience in teaching and assisting sophomore students in Interior Architecture to understand perspective drawings, space, and its interior design context at CFAD. These students have been introduced to the fundamental drawings, line quality and basic perspective in year one level. It is highlighted to the students that the fundamental of drawing is very important for design communication particularly in the initial stage of design process. Unfortunately, this is insufficient for sophomore level. Indeed, perception of space, forms, scale and surroundings are very complex design process (Imam 1999). Autodesk known as the Homestyler introduces a method, which combined traditional design skills; sketches and drawing assisted by online 3D application. The uniqueness of this 3D simulation technology has attracted many interests in its potential and has been widely used in many industries (Sun 2013). In this exercise, the importance of freehand drawings highlighted. (Tolba, Dorsey et al. 1999) explains, "Freehand sketching has long had appeal as an artistic medium for conceptual design because of its immediacy in capturing and communicating design intent and visual experience". According to (Whale 2002), there are some circumstances in the field or art and design, which the use computers for drawing would seem to confer few tangible benefits. The use of these combined methods initiated due to lack of understanding 3D space visualization and difficulties in visualizing perspective drawing. This hybrid method has given a significant contribution in assisting students to understand design elements in perspective drawing. Lawton (2007) sees this as a bridge creating balance between two domains; visual arts and sciences.

In this exercise, students should complete unit 3A: Understanding and Exploration of Space as one of the university's requirements before they can proceed for the next following years. This unit is designed to stimulate investigation into the pragmatic aspects of design, including human behavior, universal design concepts, ergonomics, structure, materials and construction, and their integrated application in creating interior and architectural spaces in conjunction with recommended research of contemporary architectural and interior design examples. Students' perspective drawing skills was evaluated based on the first stage (proposal), second stage (using online 3D application) and final stage (improvement of the drawing based on both stages (1 and 2)) The early stages fully utilized traditional media such as pens and pencils as a means for communication (Dorsey 1998, So, Kanaya et al. 2007). Using online 3D application is very effective (Sun 2013) and the design process would be better with the use of computer application to simulate its process (Jun 2012). This approach seems to be a good match for the technological applications being developed today (Shukla 2015). In some of engineering subject, students are required to design, create and produce new ideas, product or technology (Ramlan 2015). Technology as part of a learning theory is more than a tool; it becomes the framework for the methodology the effectiveness of this method is demonstrated with the given samples of students' work before and after the implementation.

2. Issues

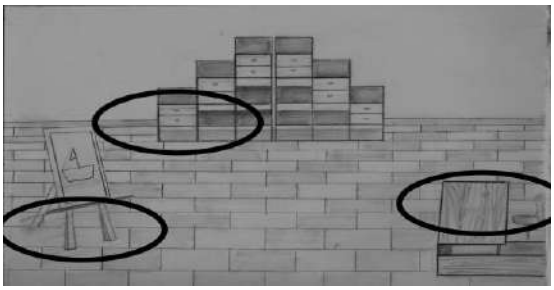
While the world is changing with an unbelievable speed, the field of interior design also encounters with the changes and shows continuously development. For coping with the change in the education system and keeping pace with such dynamism, our unchanged principle is the continuous learning and development. Within this development, the interior architecture has gained a situation which requires new expertise fields (Fitoza 2015). From the observation, it is found that the students have some issues in understanding the perspective drawings and how to visualize objects like furniture and accessories from perspective angle. In addition, majority of the students are still facing proportion and scale problem. Most of the drawing elements are not well scaled and proportioned with its surrounding. The depth of the objects in the drawing is always

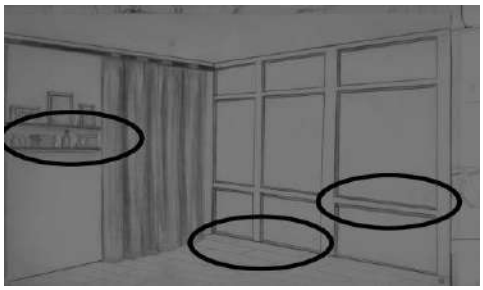
incorrect. This is also related to the skills in orthographic drawing projection which affects the presentation drawings particularly perspective drawings. Our first attempt to overcome this is by suggesting the students to evaluate and visualize the surrounding environment, mock-up model and take photos for perspective drawing reference. The problem with the mock-up model, it cannot be constructed until the drawings have been finalized and reference photos from surrounding do not match with the design scheme.

3. Methodology

To facilitate this problem, further investigation was carried out and an online 3D application was proposed. Autodesk Homestyler was chosen to assist the perspective-drawing problem. The use of this application was justified based on its available as a free online 3D tool for interior architecture purpose, have numerous numbers of furniture library and not depending on extensive hardware requirements.

Firstly, the problem was identified by evaluating a series of students' drawings and categorized the problems into several categories such as scale/proportion, lines quality, object depth, vanishing point and drawing details. Figure 1 shows some of these problems in the drawing. Some of the elements like windows look flat and no depth. There is incorrect vanishing point for perspective which resulting strange object angle and orientation. Floor tiles are flat and proportion is wrong.





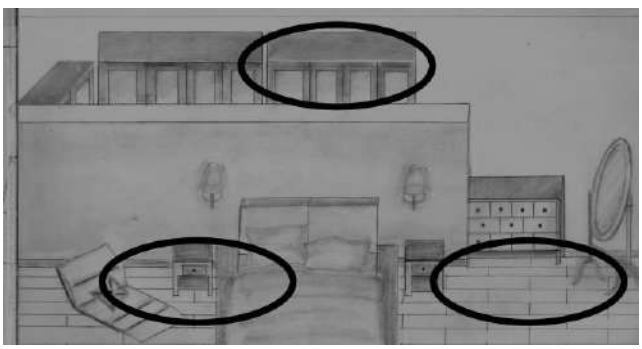


Figure 1: *First Perspective Drawing based on Proposed Plan using No References (Source: Student exercise on perspective drawing)*

For the next steps, students used their draft plan as reference to reconstruct 3D plan in Homestyler. Furniture and accessories were placed accordingly to the plan. Cameras were placed and perspective angles were set based on individual basis. The images can be produced in three styles; basic snapshot, high-resolution snapshot and 360 panorama. Students can choose the best angle as their perspective reference. The entire workflow for this process is shown in Figure 2.

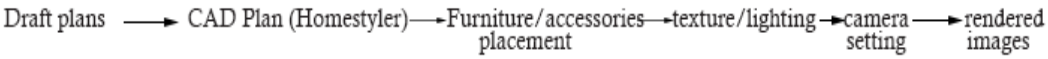


Figure 2: *Workflow of creating reference perspective in Homestyler (Source: Homestyler file of student work)*

In this case, basic snapshot is recommended for perspective drawing reference. Images from snapshot were used as guideline and comparison. Student can justify the right angle of perspective, object depth, scale and proportion of the whole design in their drawing. Figure 3 shows the camera setting used in Homestyler to create reference perspective image.

Figure 3: *Main interface of Homestyler (Source: Homestyler file of student work)*

4. Results

The implementation of this hybrid method, online 3D application, and traditional drawing have helped students to understand interior spatial context, able to visualize and imagine perspective in 360 degree. The reference created in Homestyler helped students to evaluate how the actual final design looks like. In addition, quality of the drawings can be improved by doing more drawing exercise and the previous perspective drawing problem were solved with correct design elements, proportion, and scale. A survey was carried out to evaluate the effectiveness of this method. 26 students participated in this survey and some of the significant findings are presented in the following figures (Figure 4, 5 and 6).

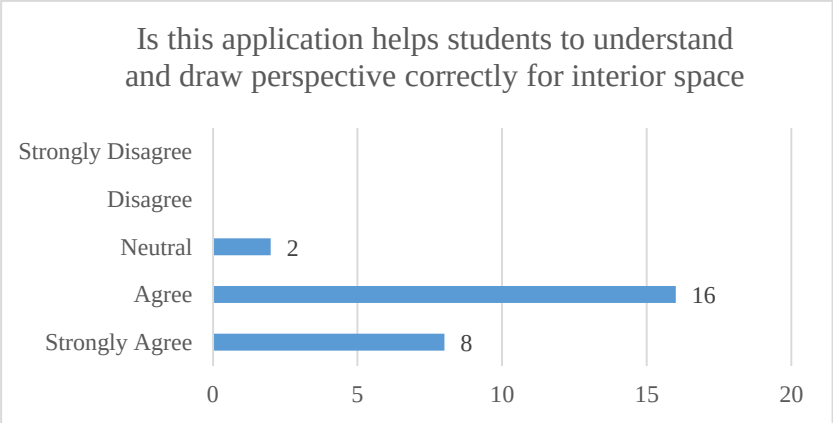


Figure 4: *Is this application helps students to understand and draw perspective correctly for interior space (Source: Survey for using Homestyler)*

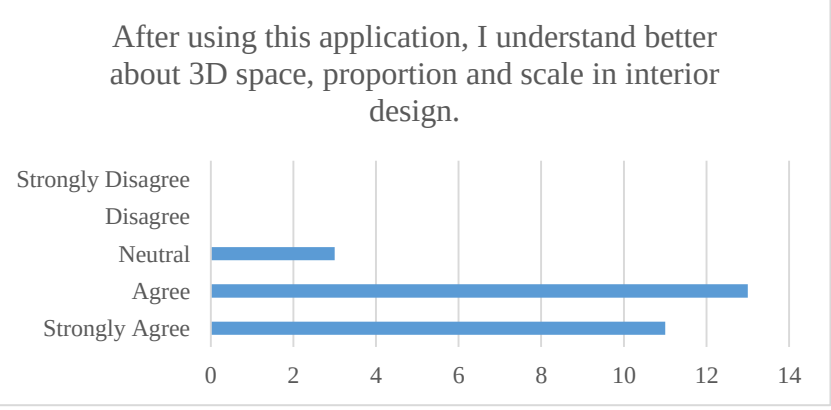


Figure 5: *After using this application, I understand better about 3D space, proportion and scale in interior design (Source: Survey for using Homestyler)*

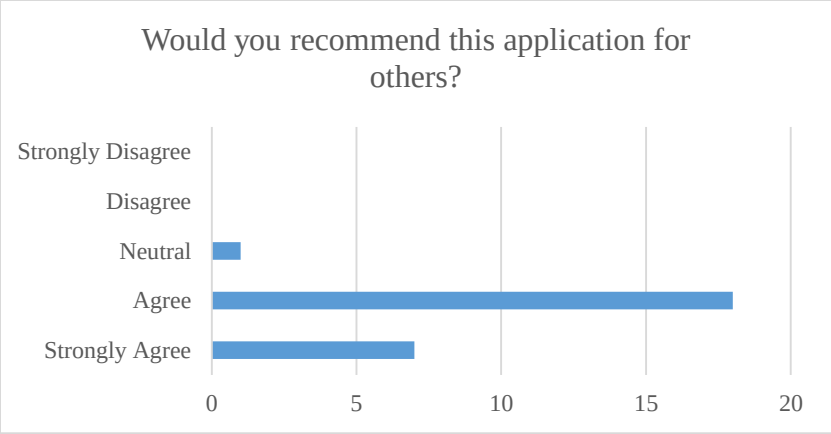


Figure 6: *Would you recommend this application for others? (Source: Survey for using Homestyler)*

From the findings, it is found that the use of Homestyler as a tool to assist students to visualize space and to draw perspective drawing has given a significant result. Figure 7 shows the quality of the drawings produced after the implementation compared to the early development in previous figure 1. It can be seen that the perspective vanishing point, scale, proportion, line quality and framing of the perspective were well presented and properly drawn compared to the early drawings.

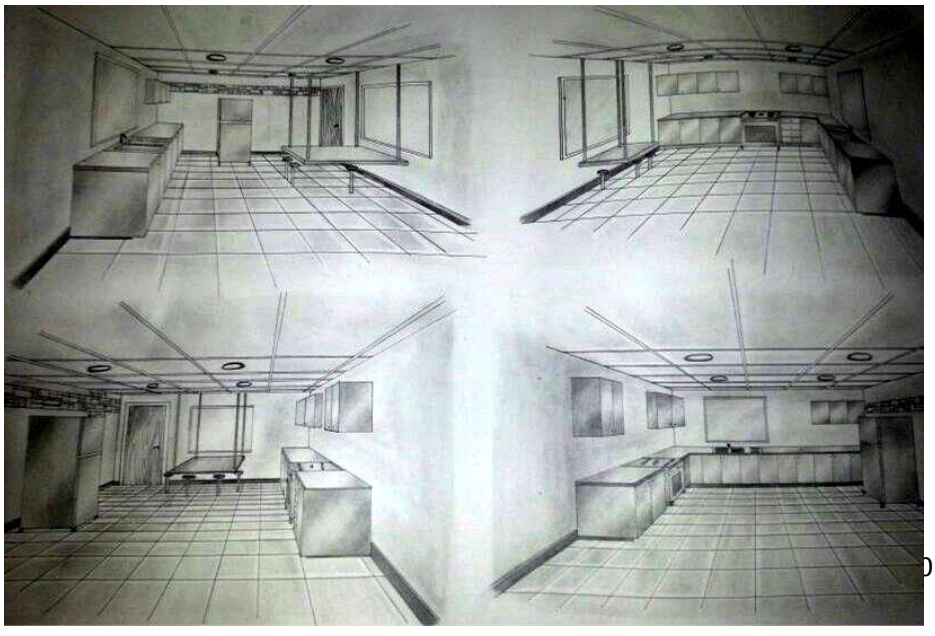


Figure 7: *Improvement of the drawing skill after training and using reference from Homestyler (Source: Student exercise on perspective drawing Source)*

5. Conclusions

This paper described implementation of combining traditional drawing skills for perspective drawing assisted with 3D online application known as Homestyler. This method has solved some problems with the students who have difficulties in visualizing and imagining 3D object in perspective drawing. From our observation, fundamental issues in interior design like understanding spatial elements; scale, depth, proportion, orthographic projection can be assisted by implementing this method. Our studies have shown some samples of learning improvement particularly in interior design foundation. Samples of the early stage of students work have been presented and the process of applying this method have been explained. Finally, the output from this hybrid method is shown because of its effectiveness. This method will continually to be used to assist students in this exercise.

6. Future Recommendations

The idea of using this hybrid method is not to replace existing traditional perspective drawing skills. It is to assist the weakness in the early perspective drawing development particularly for sophomore students. It is suggested that the introduction of the perspective drawing with consistent training and exercises supported by 3D images as reference would benefit the learning process. The authors are currently looking forward to work with 3D programmer to create an application which use less computing power with minimal graphics features such as creating 3D outline out of 2D drawing. This would be more useful and practical for reference drawing due to the requirement of perspective drawing is the right angle and proportion.

References

Dorsey, J. M. L. (1998). Computer Graphics and Architecture: State of the Art and Outlook for the Future. Computer graphics -new york- association for computing machinery- 32(1): 45-48.

Fitoz, I. (2015). Interior design education programs during historical periods. Procedia-Social and Behavioral Sciences.V174,PP:4122-4129.

Imam, S. M. N. (1999). Perception of space: How computer can help it, an evaluation with reference to design studio activity. Advanced Research in Computers and Communications in Education. Japan, IOS Press.

Jun, Z. (2012). Advantage of the three-dimensional computer simulation technology assisting the interior design. The Modern Communication 4.

So, H., I. Kanaya and K. Sato (2007). Hyperdraw: a new computer aided drawing system based on prediction of drawing action. Proceedings of the international conference on Advances in computer entertainment technology. Salzburg, Austria, ACM: 234-235. https://doi.org/10.1145/1255047.1255101

Sun, L. (2013). Influence of 3D Computer Simulation Technology on Interior Design. Proceedings of the Second International Conference on Innovative Computing and Cloud Computing. Wuhan, China, ACM: 219-221. https://doi.org/10.1145/2556871.2556918

Ramlan, R. & Ngah, S. (2015). Student perception on the importance of soft skills for education and development. International Journal of Social Sciences.V1, N1,PP: 696-708.

Skukla, A. (2015). Constructivism and integrating of ICT: Powerful blend of teaching-learning process. International Journal of Social Sciences.V1, N1,PP: 219-221

Tolba, O., J. Dorsey and L. McMillan (1999). Sketching with projective 2D strokes. Proceedings of the 12th annual ACM symposium on User interface software and technology. Asheville, North Carolina, USA, ACM: 149-157. https://doi.org/10.1145/320719.322596

Whale, G. (2002). Why use computers to make drawings? Proceedings of the 4th conference on Creativity & cognition. Loughborough, UK, ACM: 65-71. https://doi.org/10.1145/581710.581722