

The Application of Action Research to Integrate the Innovation in Learning Experience in a Design Course

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Abstract—This case study used the action research concept as a tool to integrate the innovation in a learning experience on a design course. The action research was investigated at Prince Sultan University, College of Engineering in the Interior Design and Architecture Department in January 2015, through the Higher Education Academy program. The action research was presented first with the definition of the research, leading to how it was used and how solutions were found. It concluded by showing that once the action research application in interior design and architecture were studied it was an effective tool to improve student's learning, develop their practice in design courses, and it discussed the negative and positive issues that were encountered.

Keywords—Action research, innovation, intervention, learning experience, peer review.

I. INTRODUCTION

INNOVATION can be defined as a new idea, an effective device or a process [1]; it can be viewed as the application for better solutions that meet new requirement in articulate needs, or existing market needs [2].

'Innovation' as a process required participants to be engaged in a concrete experience and an abstract conceptualization [3]. To make the student's learning more effective and to produce better design solutions in architectural and interior design projects. Subsequently, the Interior Design and Architecture program, educates students who are prepared for professional interior design and architectural practice immediately following graduation. Higher education courses provide a sound foundation of professional study for a career in interior design and architecture.

The course in Building Construction and Structure covers the basics in structural design and building construction that is relevant to technical training of architects and interior designers. This course helps students develop an understanding of the variety of building materials, their behaviors as structural elements, building products, sets of codes and construction procedures, all of which determine their safe applications in the context of a building.

The first week of the course revealed that students were not equipped with the basic understanding of building

construction work. The course assumed that students would enter the course with sufficient basic knowledge. The basics are considered to be the important fundamental elements in theoretical practice and are crucial for meeting the needs of the course. In view of the lack of their knowledge students were asked to design and construct a 'real' project in order to get familiar with building materials that they will later learn on the course.

II. AN OVERVIEW OF THE ISSUE OF CONCERN

Fifteen years of teaching experience in the field of Interior Design and Architecture, has encountered a majority of students that lack the practical challenges on their design courses, also they have been known to lack the ability to conduct and work on a 'real' project based research, consequently, this has corroborated the existence of such problems.

In an attempt to remove this problem, the integrated innovation on this new learning experience during the design course encouraged the promotion of student's appreciation of the interrelatedness of all construction operations, from the conception of an idea to choosing finishes. In addition, this allowed designers to produce research contributions based on their strength in solving the problems to formalize a design and find the best design solutions.

III. INNOVATION IN LEARNING EXPERIENCE

A task within the subject of 'Building Construction' and 'Structure' were presented to the students to construct and design a 'real' Spanish restaurant, hence becoming familiar with the building materials taught on the course. The finished product would be displayed in the exhibition, at the university in the courtyard.

Forty-four students participated from two sections. They were merged and formed into groups of 4 or 5, which resulted in 9 different projects. Each group shared their positive and negative contributions, developing and improving their teamwork skills.

The students followed the conception of an idea to choose the final decoration for their restaurant. The reflections and acting upon them was measured according to what the students had shared in their class.

This experience was useful for both teacher and student, enabling them to present their final 'real projects' in an exhibition and receiving feedback from experienced faculty

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members who were invited to the exhibition to evaluate and develop their learning experience [4].

The requirements for the project were to:

- **Search** the Spanish history and culture: analyze their interior and architectural solution and end with the design recommendation for the project.
- **Submit the group's design of a Spanish restaurant: including** the architectural drawings, the decoration related to Spanish style, and design the layout for the exhibition day.
- **Self evaluate their work** following the presentation of their final projects on the exhibition day.
- Use **computer software techniques** to present their ideas with different and challenging methods. [5]
- **Manage their time** and ensure submission is on time.

The Interior Design and Architecture department extended the invitation to the admin, other faculty members and students. This mixture of attendees resulted in a ray of questions and compliments which inspired the students to provide answers on their creativity. In addition, they benefited from the varied feedback of such a wide variety of visitors.

The main areas of focus on the action research were as:

- A- **Develop** a spirit of innovation and creativity amongst the students in the field of the design based on research papers taken on the course.
- B- **Create** a link between what the students have learnt on the theoretical part of the project during their classes and understanding the practical reality of the end product.
- C- **Real world perspective** involved on the course: creating a real sense of the authentic Spain on the exhibition day.
- D- **Reflection and acting** upon them: Students had the opportunity to focus on developing and improving their practices. Students were able to apply what they had learnt by identifying the variety of building materials, and their behaviors as structural elements of the design in order to produce a finished product. On reflection they learnt that the group project enhanced their communication, interaction and teamwork skills.
- E- **Effective cooperative learning** involved structuring classes for the preparation of the project. This involved class topics that united the students in a cooperative learning environment. This directed them towards the development of constructive communication and the engineering of their collaborative design.
- F- **Manage the class time** to accomplish the learning objective by providing the students with a week-by-week task to finalize their project on time.

IV. PROBLEMS FACED WITH THIS PROJECT

- A- Two sections were enrolled on the course and mixed in groups, a relationship forced on them to complete a task. Joined by commonality in study of Interior design and Architecture. Together they had to submit different designs for the same project. The unfamiliar sections had to work together as a group and present one project. They needed to choose the materials, architectural and interior

decoration and provide an estimation of the cost of the construction for the exhibition.

- B- To present their ideas was expensive, especially as the architectural Spanish design needed a special design and material to present the idea.

V. ACTION RESEARCH PROCESS

The action research was used to improve the practice on the building construction and structure course. The focus was on: **Integrating the innovation in the learning experience on the design course.** According to [6], an action research process consists of four interrelated activities: Planning, acting, observation, and reflection (Fig. 1).

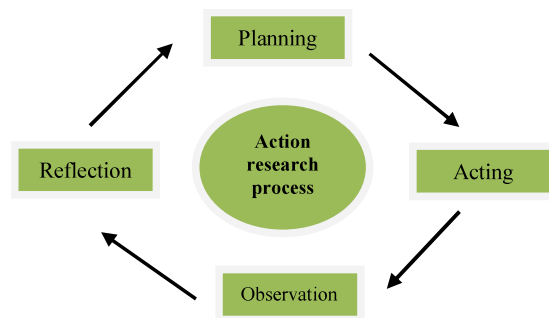


Fig. 1 Action research process

- A- **Planning process:** uses the action research approach to solve an issue or problem, which leads to the improvement of students' learning experience on the design courses.
- B- **Acting:** is to apply the action that would help to solve the problems.
- C- **Observing:** the changes on the practice based on the changes.
- D- **Reflection:** Modify the reflection and actions that have been taken to improve the situation.

The criteria are used to evaluate the student's project and to help our staff members to evaluate their projects. It was divided into three main parts: (Fig. 2)

- **Design Concept 20%** (Research- Design recommendation, and the design concept)
- **Design 60%** (design development, design solution, and final drawing & details)
- **Final presentation 20%** (quality of presentation, final board design, oral presentation)

VI. USING PEER REVIEW

In order to improve teaching and learning on the course peer review is intended to evaluate and discuss teaching materials in order to give feedback on the student's work [7]. This is collaborative process in which the instructor under review works closely with a colleague to discuss her teaching. These peer reviews of teaching are a mechanism whereby peers can observe and comment on some functional or aspects

of quality teaching that is undertaken and the learning that we promote.

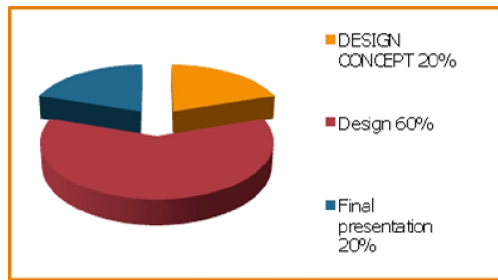


Fig. 2 The evaluation criteria for the final project

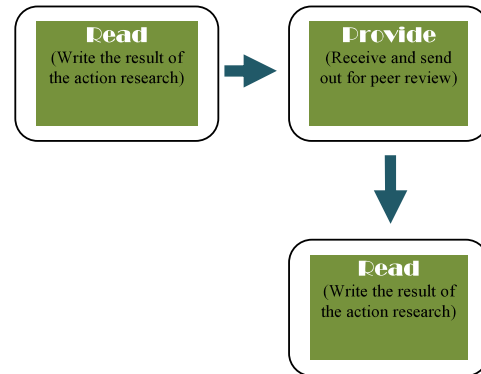


Fig. 3 Peer review process

The peer review process supports the following:

- Developing self-awareness.
- Reflect the practice.
- Enhance awareness of the students learning experience.
- Recognize and identify good practice in others.
- Identify further professional development needs.
- Identify and promote good practice and innovation in teaching and learning.
- Deepen understanding of the work of colleagues in and across teams.
- Provide evidence of quality teaching practice for promotion application.

Faculty members were chosen from the same field to review teaching and to provide confidential feedback in the peer review format. (Fig. 3)

The discussion was based on looking at teaching practice as a continual process of improvement [8]

After the discussion, a written feedback is received from the reviewer: the feedback includes:

- The areas of strength, including the development in relation to the focus of the review and it concludes with a summary of the discussion.
- Then the relevant points for practice are written: They are based on the following points:
- The issues that were raised during feedback and, how it was relevant in the practice.
- What action might be taken?
- The future plan is to build on this experience to enhance teaching and students learning.
- Then the reviewers' feedback is received with a reflection, which includes:
- The issues that arose during the action research that held relevance for practice.
- What action the reviewer may take?
- How the reviewer built on this experience to enhance teaching and student learning?

VII. POSITIVE POINTS THROUGH ACTION RESEARCH

The experience of **integrating the innovation in the learning experience in the design course** included the **positive points**, which went well throughout this action research for the following reasons:

- It has taught students how to develop their design concept and programming for final projects.
- Integrating the innovation allowed the students to design different and creative projects and understanding the practical reality [9].
- Their computer experience enhanced the student's performance and it allowed them to produce their creation while ensuring the requirements in a professional way.
- Shared responsibilities amongst the students who were all enrolled on the same course and later put in groups; improves the quality of the work.
- The advantage of the students having their project's exhibited in the exhibition related to the course context offered them an opportunity to develop their learning and extend it to a wider audience.
- Useful feedback from the attendees, especially faculty members who helped to evaluate and improve teaching techniques from the student's projects.

VIII. NEGATIVE POINTS THROUGH ACTION RESEARCH

There were some **negative points**, to the action research:

- In order to construct this kind of the project in reality it needed an extra budget to find the suitable materials required for presenting.
- Too many students were enrolled on the course, which meant that in order to assess their learning the instructor needed to organize groups rather than individuals to present their work. The instructor should have a link between the entire projects design that was created by more than one student.
- Not all the students have the same ability to design their projects in talent and in a creative way, which might cause problems with their teamwork.

IX. BRIEF CONCLUSION

- Integrating the Innovation in the learning experience on the design course developed the practice with effective strategies/techniques and was used to encourage the student's research during their design course.
- This was a great opportunity for students to enhance their academic performance by applying what they have learnt through research on their design courses by way of classroom assessments, which improved the teaching and learning outcomes. [10]
- It is believed that this experience will affect future practice to improve student learning in the classroom not only to grade them but this will not happen without sharing the responsibility between the teachers and students in learning.
- The conceptual framework will prepare the students to engage in the innovation of learning from the beginning of the project research through to the final project drawing.
- Exhibiting a final project teaches the students how to express their participation and explain how it was created using the elements of what was taught so far. They develop their skills in presentation and learn how to accept compliments or criticism on their project. Most of all they will have a sense of achievement as a team member.
- Searching for interesting approaches of teaching for the future and sharing the findings with colleagues, hence making the connection between different courses, students and levels will help to serve the course objectives.
- One of the advantages of having the evidence of the student's project at the end of the course is that it will measure the quality of the teaching during the course and the students level. It will also allow the instructor room to improve her teaching.
- The importance of sharing the information in a peer review provides each member with the constructive feedback on its effectiveness in promoting student learning which will improve the learning for each course.
- Measuring the student's outcomes at the end of the semester for each course is intended to reflect the efforts rather than how many chapters were covered in the textbook. The quality of teaching precedes the quantities.
- The advantages of the cooperative learning which encourage students to work together as a team, promoting skills in leadership, communication, negotiating, sharing of ideas and knowledge, steers them towards engineering a masterpiece of a project.
- Classroom management is an important factor for the learning objective to be accomplished successfully.

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