

Advanced Strategies to Improve Quality of Teaching and Learning in Higher Education: Focusing on Architecture Engineering

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ABSTRACT

University students of this digital era are overwhelmed by all sorts of electronic and smart gadgets, which makes it hard sometimes to keep them engaged and switched on in lengthy applied classes, particularly with large number of engineering students in practical courses.

The main purpose of this research is to investigate and identify the areas of weaknesses of teaching and learning in lengthy, large and practical architecture engineering classes in order to develop strategies to improve quality of teaching in applied disciplines in higher education, focusing on architecture engineering.

The paper also aims at developing advanced teaching techniques to enhance the learning outcomes in actual and virtual classroom environments. Some other objectives are to review and modify course specifications to improve its learning outcomes, to create an active and more effective classroom, and to link the course material with the local built environment of the region.

The research methodology comprises an ‘Action Research’, which include the instructor’s personal observation about the concerned class/course, students’ questionnaires, and peer observation.

The findings and conclusion of the paper demonstrate the some advanced teaching strategies developed to improve classroom management and make the lengthy classes more interesting and engaging to the large number of architecture engineering students.

Keywords: *Advanced teaching strategies, Enhancing classroom management, Architecture engineering education, Virtual learning environments, Flipped classroom strategy.*

1. INTRODUCTION

University students of this digital age are overwhelmed by all sorts of electronic smart gadgets, which makes it hard sometimes to keep them engaged and switched on in lengthy applied classes, particularly with large number of engineering students in practical courses. This is almost a typical case for architecture engineering students who are asked to attend lectures, laboratories and design studios for a continuous period of time that can extend to four, six and sometimes eight hours.

The aim of this research paper is to develop some advanced strategies to enhance the quality of teaching and learning of lengthy, large and practical architecture engineering classes. In order to achieve this aim, the author/instructor needed to review and assess the material of the concerned course, which

comprises lectures and laboratories. The developed strategies should also engage students and encourage participation; turn the lengthy class from being boring to interesting, active and more effective class, as well as to link the course material with the local built environment of the region.

Therefore, the focus of this research is to identify the areas of weaknesses of teaching and learning of the concerned course and find effective strategies to address and tackle them.

2. THE RESEARCH BACKGROUND

2.1 The problem

After a couple of weeks of teaching a new architecture engineering course, Environmental Control 1, the author/instructor noticed that many students started to lose interest and some of them started to disturb the class. The author quickly realized that an immediate action has to be taken and was then warranted by embarking on design an ‘Action Research’ to identify, address and tackle the emerging problems.

2.2 The aspects of the practice investigated

The purpose of the designed ‘Action Research’ was to review and assess the course material including lectures and laboratory materials, as well as teaching strategies. The objectives were: 1) to enhance the quality of teaching and learning in classroom [3] & [5]; 2) to engage students and encourage more participation and interaction with the instructor, and with each other; 3) to turn the lengthy class time from boring to interesting, active and more effective class (four hours once a week); and 4) to link the course material (concerning climatic and environmental design) with the local built environment and specific climate zone in the Arab Gulf region. It is worth mentioning that teaching in this private Saudi university is in English but unfortunately, all available English textbooks for the concerned course are written by Western authors for Western countries and associated environments, such as North America and Europe, which certainly have different climates, cultures and interests.

The author believes that making course material related to the students and their specific environment is more important than keeping them just switched on. The ultimate goal is to develop relevant and purposeful activities that both engage students enthusiastically and connect them with what they previously learned, which help building and sustain lifelong knowledge. The author learned from experience that effective teaching helps students to identify patterns and place new information in context with the old [2].

2.3 Brief details of the course

The course concerned with this research (Environmental Control 1 - Arch364), focuses on energy-related issues as they apply to site planning and architectural design, including thermal design comfort, site climate analysis, building thermal response, and solar system design. The course presents atmospheric and thermal comfort services, air treatment, distribution systems, and related energy systems for human comfort. Understanding of water resource supplies and treatment, distribution and disposal systems are essential elements in the course.

The course class time consists of a four hours block, once a week. It comprises a two hours lecture followed by a two hours laboratory session. The course time as initially allocated seemed to be very long, boring and sometimes problematic, especially with a large number of students.

Therefore, the author designed an ‘Action Research’ to reassess and amend the course content and structure to address the abovementioned research objectives.

The course components include lectures, laboratory, quizzes, midterm and final exams. However, the Environmental Control Laboratory has not been available due to logistic reasons, therefore the practical part of the course had to be replaced temporarily with other research activities.

2.4 Brief details of the students’ cohort

The concerned class consisted of thirty female students in third year, bachelor of architecture engineering. When the course started and within a couple of weeks, the author was able to classify the students into three groups. The first group was the hard working students who used to come to class always on time, well prepared and sit at the front of the class, used to participate and pay attention; they formed about twenty five per cent of the class. The second group represented the average students and they formed about fifty per cent of the class. The third and last group were less motivated students who used sometimes to disturb the class.

2.5 Reflections on the practice

The main focus of the planned Action Research was to identify the areas of weakness of teaching and learning in the concerned course and to find the best strategies to address and tackle them. To be able to do so, the author scrutinized all elements of teaching involved in this class.

The class time as initially allocated seemed to be very long, boring and sometimes problematic, especially with large number of students, 30 on average.

Based on the above mentioned considerations, the author has designed the ‘Action Research’ to answer the following questions:

- What can be done to make the lecture more interesting and less didactic?
- How can the instructor adapt the practical part of the session to meet different learning styles?

Academic research, concerning working of the brain and improving pedagogy in the higher education classroom, finds that the upper limit of the human brain’s capacity to pay focused attention to a lecture is about 20 minutes. It explains that “*the human brain constantly seeks meaning and pattern in a rich milieu of emotions, facts, associations, memories, and other inputs.... we can capitalize on the brain’s hunger for meaning by providing information in relevant contexts that yield both intuitive and logical meaning*” [10].

As discussed earlier, the ‘Action Research’ aimed to develop better class management and make the lengthy class time more interesting and engaging to the large number of students. Since the class of the concerned course consisted of a large number and diversified students, it was important to understand the students’ academic performance levels and their different learning needs. The instructor’s earlier classification of students groups showed that the third group was the least motivated students and often disengaged. The students of the third group also used to get bored easily, they rarely participated at class and after a short period of time they start talking to each other and disturb the rest of the class. According to Lipinge, when classes are too large, students are considered to contribute some complex challenges related to the teaching and learning process. Therefore, the concerning matter needed to be addressed and tackled in an ‘Action Research’ [14].

2.6 Plan for intervention

The instructor’s plan for intervention included the following:

- a. Personal observation about the concerned class/course,
- b. Design a questionnaire to get students feedback on the course material and delivery, classroom management, as well as students suggestions for improvement,
- c. Seeking a ‘peer observation’ from a university colleague to review the course material including lectures and laboratory materials, as well as teaching strategies,
- d. Addressing the key issues discussed in the ‘peer review’, by implementing new ideas and strategies recommended to tackle the identified weaknesses and problems.

2.7 Overview of action research

According to Denscombe, ‘action research’ is either a research initiated to solve an immediate problem, or a reflective process of progressive problem solving to improve the way of addressing issues and solve problems [11]. The purpose of an “action research” strategy is to solve a particular problem and to produce guidelines for best practice.

The process of an ‘action research’ works as a cyclic; starts with identifying an area of focus (the problem) then, collecting data, then analyzing and interpreting the data, and finally developing an action plan to tackle the problem (**Error! Reference source not found.**). Researchers usually repeat the process as a whole or partly if necessary until the problem (or the area of focus) is solved and they become satisfied with the results [17].



Figure 1. Action research as cyclic (Source: the author).

The key issues the author wanted to address in the ‘Action Research’ in order to improve class performance and achieve more effective and efficient class management were:

- a. Tackling the lengthy time of the class (4 hours block, once a week, which consists of 2 hours lecture plus 2 hours laboratory),
- b. Making the lecture more interesting,
- c. Adapting the practical part of the session to meet different learning styles.

3. THE RESEARCH METHOD

The author has adopted a mixed methods approach based on a qualitative case study research (QCR) to conduct, analyze and evaluate the ‘Action Research’ case study. There are two main approaches that guide case study methodology, one proposed by Stake and the second by Yin. Both approaches try to ensure that the subject of interest is well investigated, and that the fundamental nature of the phenomenon is revealed [18] & [20]. Both Stake and Yin base their approach to case study on a constructivist paradigm, which claims that truth is relative and that it is dependent on one’s perspective [16]. This paradigm “*recognizes the importance of the subjective human creation of meaning, but does not reject completely some concept of objectivity*” [8]

The adopted approach combines observation, description and qualitative research methods in assessing the case study. The author designed the research method to answer the following questions:

- What can the instructor do to make the lecture more interesting and less didactic?
- How can the instructor adapt the practical part of the session to meet different learning styles?

3.1 Data collection

In order to understand the different needs of the students of the concerned class and achieve better results for the Action Research, the author has designed and conducted a students’ questionnaire, focusing on the two following questions:

- How do you think the instructor can improve teaching style/strategies to maximize your benefits?
- Give some suggestions to improve the course delivery and maximize quality of learning.

3.2 Implementing the action plan

The author/instructor monitored the concerned class/course to assess the overall performance and recorded her own personal observation. She has also conducted the questionnaire with the concerned class groups. Academic research finds that one of the advantages of this approach is the close cooperation between the researcher and the participants, while enabling participants to tell their stories [1]. Through these stories, the participants are able to describe their views of reality and this enables the researcher to better understand the participants’ reactions [13] & [15].

The questionnaire was conducted with the concerned class, which consisted of 30 national and international female students. Only 24 students have completed and returned the questionnaire sheets.

3.3 Data processing

After conducting the students’ questionnaire, the author analyzed and interpreted the collected data using Codes and Themes to organize style of interpretation [8] & [9]. The author has also used Coding Data as a data reduction method. In qualitative research, codes are typically words or devices for identifying themes.

4. REFLECTIONS ON THE INTERVENTION

4.1 Students questionnaire

Due to the relatively small research sample of the participants (30 students), the author used manual coding and analysis, and for this purpose, she designed simple table to identify and organize themes (Figure 2).

In the questionnaire, the author focused on two main points; firstly, how to improve teaching styles and strategies to maximize students’ benefits. Secondly, students’ suggestions to keep them engaged at class, to improve the course delivery and maximize quality of learning.

No	Themes	Participants	Total	Stud. %
1	Practical applications & Exercise	p1, p2, p5, p6, p7, p9, p14, p16, p20, p21, p23, p24	12	40.0
2	Redesign projects	p1, p2, p12	3	10.0
3	Visual aids (pictures & videos)	p2, p3, p5, p8, p9, p10, p11, p14, p15, p19, p20, p21	12	40.0
4	Split class time	P2, p9, p12,	3	10.0
5	Less theory	p2, p5, p15, p21	4	13.3
6	Defining & simplify terminology	p2, p16	2	6.7
7	Creative ideas, mind maps	P3, p6	2	6.7
8	Improve performance & class management	P4, 13, p22	3	10.0
9	Site visits & field trips	P5, P11, p13, p14, p18, p19, p22	7	23.3
10	Discussions, more	P6, p11, p12, p19	4	13.3
11	Group work	p12,	1	3.3
12	Case studies & examples	p12, p18	2	6.7
13	Undecided		6	20.0
	Total		30	100.0

Figure 2: A table shows data analysis of students’ questionnaire (Source: the author).

4.2 Data interpretation:

Students’ response was analyzed using coding and themes to find patterns and extract ideas and suggestions. The author found and classified 12 themes recommended by the students to improve the course. The analysis showed that 40% of students suggested including more “practical applications and exercise” to the course. While 40% of students suggested adding more “visual aids such as pictures and videos. Whereas, 23.3% of the students believed that “site visits and field trips” would help them to better understand the subject. Furthermore, 13.3% of students proposed “reducing the theory part” and increasing the time for class “discussions”. Ideas like “redesign projects”, “split class time”, “improve performance and class management” received 10% each of students support.

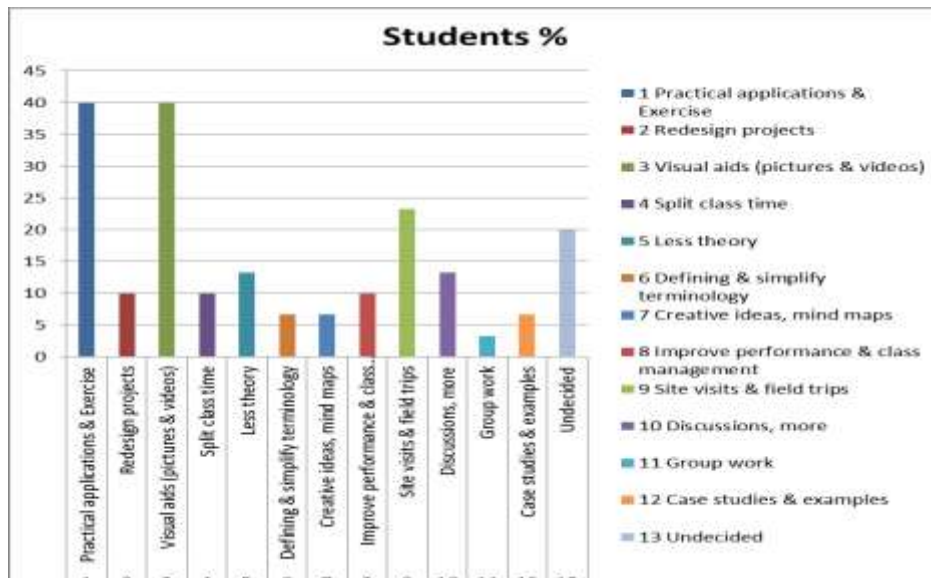


Figure 3: A chart shows the results of the data analysis (Source: the author).

Suggestions like “defining and simplifying terminology”, “creative ideas and mind maps”, “case studies and examples” and “group work”, received between 7% and 3% of students support. However, 20% of the students didn’t respond or undecided (Figure 3) and (Figure 4: A diagram shows students suggestions volumes (Source: the author).).

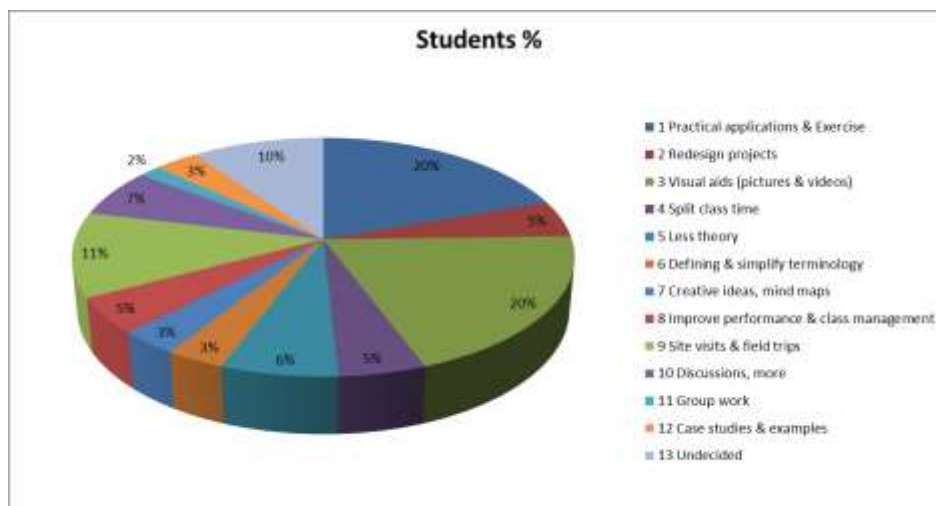


Figure 4: A diagram shows students suggestions volumes (Source: the author).

The author finalized her own classroom observation and analyzed the data collected from the students’ questionnaire as well as the peer review observation, as stated above in the action plan.

4.3 Summary of peer observation, discussion and suggestions

The discussion included review of course material including lectures and labs materials sample, and teaching strategies. The author/instructor expressed her concern about the lengthy time of the course weekly class, which has been 4 hours block, once a week; consisted of 2 hours lecture plus 2 hours laboratory.

The main focus for review was “How can the instructor make the lecture more interesting/less didactic?” and “How can she adapt the practical part of the session to meet different learning styles?”

The set criteria to be used were to ‘look at the lengthy time of the lecture, the material and teaching strategy’, ‘also to look at the lengthy time of the laboratory, its material and teaching strategy’, and to review the plan to answer the above mentioned questions.

The discussion suggested ideas for development of practices such as: tackling the lengthy time of the lectures and labs by dividing them to smaller class segments and to include more activities and discussions to engage the students by using the flipped classroom strategies and game based learning methods. The instructor would also include more visual aids to the lectures such as animations, videos and YouTube links to make the lectures more informative and interesting.

Furthermore, the instructor would to include more research and group work to the lab activities, such as PowerPoint presentations by the students as well as group competitions, posters’ design and learning games.

4.4 Implementing the action plan

The instructor modified and upgraded course materials and lectures to respond to the students’ suggestions through the data analysis and interpretation of the students’ questionnaire and to meet students’ different learning styles.

The instructor found areas of strength in relation to focus of review as it follows:

- a. Applying diversified teaching/learning strategies
- b. Breaking up the long four hours class into smaller segments, 45-50 minutes each to include a) short lecture, b) students classwork activities, c) students presentation, and d) students research and Game Based Learning GBL.
- c. Employing e-Learning and Virtual Learning Environments VLE through Moodle, You-tube, as well as using emails for after-hours continuous learning.

The instructor identified areas for development in relation to focus of review, which can be summarized as the following: improving class time management, introducing more activities and discussions for further students engagement, and including diversified teaching and learning methods for more students’ engagement.

The key issues in the Peer Review feedback and discussion were: tackling the lengthy time of the class (4 hours block, once a week; consists of 2 hours lecture plus 2 hours laboratory); making the lecture more interesting/less didactic; adapting the practical part of the session to meet different learning styles.

These issues were relevant to the practice as they helped improving class time management.

Therefore, the answers to the Action Research question, what actions might the instructor take?” are as the following:

- a. Implementing ideas and strategies discussed above for better class time management,
- b. Employing the flipped classroom method to provide better and more interesting learning environment,
- c. Including diversified teaching and learning methods for more students’ engagement.

The instructor has built on the experience gained from personal observations, students’ questionnaire suggestions and peer review recommendations. Thus, in order to enhance teaching, students’ learning and to tackle the lengthy time of the Lectures and Labs, the instructor has implemented the following strategies: she has divided the 4 hours block into 2 parts; part 1 - a 50 minutes lecture followed by a 50 minutes classwork, discussions and activities. Part 2 - a 50 minutes students presentations based on the lectures material, followed by a 50 minutes class activities, research discussions and Games Based Learning.

Moreover, to include more activities and discussions to engage the students, the instructor has used the flipped classroom strategies and design course related learning games. She has included more visual aids to the lectures such as animations, videos and YouTube to make the lectures more informative and interesting.

The instructor has also included more research and group activities to the labs, such as PowerPoint presentations by the students as well as group competitions, posters’ design and learning based games.

4.5 Students’ evaluation after the action plan

The standard students’ evaluation usually includes 24 questions however, for the purpose of this research, the instructor has included questions that are directly related to amendments and improvements of the course delivery performance as a result of implementing the ‘Action Research’. The online students’ evaluation is a compulsory practice required by the University in order to allow students to access their results after the final exam at the end of each academic semester.

The online students’ evaluation included questions such as: 1) The instructor was enthusiastic about the course, 80% strongly agree and agree; 2) The instructor cared about my progress in the course, 87% strongly agree and agree; 3) course materials (texts, handouts, references etc.) were up-to-date and useful, 83% strongly agree and agree; 4) The resources needed for the course were available when I needed them, 84% strongly agree and agree.

5) Technology was very effectively used to support teaching and learning, 83% strongly agree and agree; 6) The instructor encouraged me to ask questions and develop my own ideas, 93% strongly agree and agree; 7) The instructor inspired me to do my best work, 80% strongly agree and agree; 8) Class activities, assignments, laboratories etc. helped me acquire the knowledge and skills intended by the course; 83% strongly agree and agree;

9) This course helped me to improve my ability to think and solve problems rather than just memorize information, 83% strongly agree and agree; 10) This course helped me to develop my skills in working as a team member, 87% strongly agree and agree; 11) This course improved my ability to communicate effectively, 83% strongly agree and agree; and finally, 12) Overall, I was satisfied with the quality of this course 87% strongly agree and agree.

So as an average, the data analysis of students’ evaluation after implementing the ‘action plan’ shows that 85% of students agree and strongly agree to the overall performance and improvement of the course (Figure 5) and (Figure 6).

Questions	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
1. The instructor was enthusiastic about the course.	63.3	16.7	13.3	6.7	0.0
2. The instructor cared about my progress in the course.	56.7	30.0	6.7	6.7	0.0
3. Course materials (texts, hand-outs, references etc.) were up-to-date and useful.	56.7	26.7	13.3	3.3	0.0
4. The resources needed for the course (textbooks, library, computers etc.) were available when I needed them.	50.0	33.3	13.3	3.3	0.0
5. Technology was very effectively used to support teaching and learning.	50.0	33.3	13.3	3.3	0.0
6. The instructor encouraged me to ask questions and develop my own ideas.	60.0	33.3	3.3	3.3	0.0
7. The instructor inspired me to do my best work.	50.0	30.0	13.3	6.7	0.0
8. Class activities, assignments, laboratories etc. helped me acquire the knowledge and skills intended by the course.	53.3	30.0	13.3	3.3	0.0
9. This course helped me to improve my ability to think and solve problems rather than just memorize information.	53.3	30.0	13.3	3.3	0.0
10. This course helped me to develop my skills in working as a team member.	63.3	23.3	10.0	3.3	0.0
11. This course improved my ability to communicate effectively.	53.3	30.0	10.0	6.7	0.0
12. Overall, I was satisfied with the quality of this course.	46.7	40.0	10.0	3.3	0.0
Strongly Agree and Agree average 85%	55% av.	30% av.			

Figure 5: A table shows students’ evaluation after implementing my action plan (Source: the author).

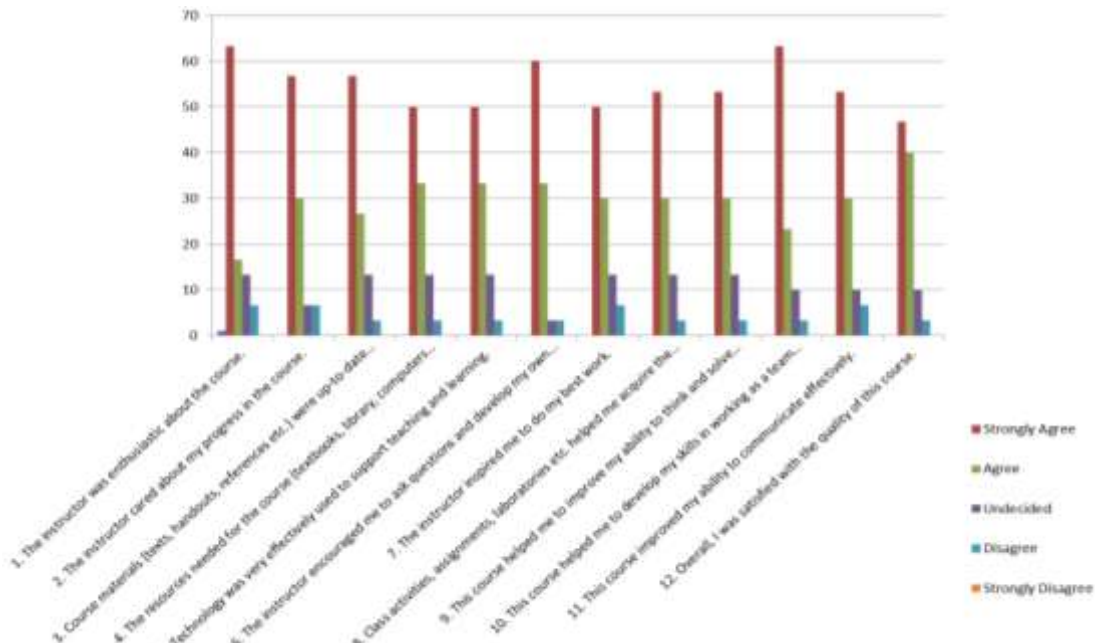


Figure 6: A chart shows the results of the data interpretation of students' evaluation after implementing the action plan (Source: the author).

5. REVIEW AND REDESIGN THE COURSE SPECIFICATIONS

In order to improve the quality of teaching and learning of the concerned class, and to implement the recommendations of the ‘Action Research’, the instructor has reviewed and amended the Course Specifications Document of the Arch364 (Environmental Control 1). The instructor has found that overall, it does include adequate reference to curriculum development that supports ‘process’ as well as ‘praxis models’ as suggested by Stenhouse and Grundy [19] & [12]

For example, the instructor has amended section (G) of the course specifications, concerning course evaluation and improvement processes, to include several strategies for improvement, taking into consideration students’ feedback and suggestions. Moreover, the instructor has updated the specified objectives to embrace diversified course delivery strategies as Blended Classroom (traditional and online 60%), e-Learning (Moodle & You-tube, etc., 20%) as well as Correspondence (Emails & LMS messages 20%), these blended teaching strategies were underpinned by curriculum models as process, praxis and context.

(Moodle or LMS is the University online system known as ‘Learning Management System’).

When amending the concerned course specification document, the instructor has tried to engage adequate curriculum design theories and worked with associated colleagues towards cooperation and integration with other related courses as prerequisite or co-requisite in an effort to allow faculty members delivering and supporting horizontal and vertical integration.

5.1 Assuring constructive alignment throughout the course curriculum

(Connectivity between Objectives, Intended Learning Outcomes ILOs, Learning Domains, Content and Delivery, and Assessment)

In an effort to redesign the concerned Course Specifications Document CSD, the instructor/author has considered constructive alignment throughout the document as suggested by Biggs (2003).

The instructor has used consistent vocabulary to support alignment across the curriculum and connecting the course objectives and content, the course description, the National Qualification Framework (NQF) learning domains, the Course Intended learning Outcomes (ILOs), as well as suggested resources. The instructor has attempted to maintain consistency not only in the vocabulary, but also by the overall language and syntax of the CSD.

By reviewing amending the concerned Curriculum Specifications, The instructor has adopted adequate alignment within the mode of instruction and assessment. Furthermore, she realize that the ILOs should be stated clearly to students, so their tangible learning outcomes can be tested in order to aligning curriculum objectives and assessments as recommended by Biggs. This was achieved through the ‘Course Syllabus’ (that complements the ‘Course Specification Document), which the instructor has handed and explained to all students at the beginning of the following semester.

5.2 Considering outcomes based approach within the amended course curriculum

In reviewing and amending the concerned Curriculum Specifications, the instructor has employed an adequate Outcomes Based Approach. In the Course Objectives section, the instructor has included students focused learning during the course teaching process. This is also supported by the amended teaching method, strategies and activities being implemented and expressed in the course objectives section of the CSD.

5.3 Amending course specifications to link the subject to local environments and resources

The instructor has amended the contents of the CSD to employ a diversification of delivery approaches and activities, in an attempt to link the type and nature of such course concerned with architecture and environmental design.

The instructor has also updated the section concerned with the “topics to be covered” to support the “modes of instructions” as stated in on the CSD, as well as the “course objectives”. With regard to the modes of instructions, the instructor has improved students’ engagements and participation by introducing case studies research, group work and group presentations. Moreover, the instructor increased the types of activities to create opportunities for students/instructor’s discussions, debates and face to face feedback. Nevertheless, the Curriculum Specifications still have further opportunities for improving the current learning environment as shown in through plans to include more innovative and students engaging teaching strategies.

5.4 Updating the course assessments criteria, modes and creating opportunities for formative and summative assessments

When reviewing the methods of assessment as described in this course specifications, the author found them in line with the university requirements, and follow the suggested assessment methods and teaching strategies demonstrated on the university template. This is delivered through the major exam and other assessment tools that form 60%, while the final exam forms 40%.

However, she amended the ongoing classwork and class discussions required throughout the semester to include more students engaging activities such as group research and students presentations. The wide range of assessment strategies included in this course specifications create good opportunities for formative assessments such as classwork, group research, case studies analysis, and students' presentations. There are also opportunities for summative assessments in a form of quizzes, midterm and final exams.

5.5 Quality assurance guidance and procedures in supporting the course curriculum

The instructor revised and amended the course specifications document to support constructive alignment in most aspects, as previously mentioned. She also included adequate alignment in the sections concerning Course Objectives, Course Learning Outcomes and Course Assessment as suggested by Biggs [4]. For example, the instructor/researcher redesigned the assessment tasks such as classwork and discussions activities throughout the semester, to ensure students' engagement and participation. Furthermore, she increased the weight of these tasks from 5% to 10% and included attendance as well so, it would help decreasing the students' absence rate. Amended assessment activities such as group research and students presentations (worth 20%) help developing the students' communication and cooperation skills, as well as building their critical thinking in analyzing and evaluating the research case studies.

However, there are still many opportunities for improvement such as employing students' feedback in course development and ensuring alignment to all other relevant documents such as the course syllabus, course report and the whole program specifications. Furthermore, the guidance within the national qualification framework (NQF) learning domains can be developed to accommodate the students' progress in successive academic year levels to ensure that the course advances and aligns with Bloom's taxonomy [6].

6. CONCLUSION

The 'action plan' associated with this research paper has helped to identify, investigate and analyze the problems created by having lengthy classes with a large number of students. In order to do so, the instructor reviewed and assessed the concerned course material including lectures and laboratory materials, as well as the course teaching strategies.

By implementing the research 'action plan' the author achieved the research objectives. The first objective was to enhance the quality of teaching and learning at the classroom, this was achieved by introducing new teaching strategies as recommended by the three tools of the 'action research'; personal observation, students' questionnaire and peer review.

Teaching strategies introduced to the class included more practical applications and exercise to the course, more visual aids such as pictures and videos.

The 'Action Research' also helped to engage students and encourage more participation and interaction with me (the instructor), and with each other. This objective was achieved by “reducing the theory part” and increasing the time for class “discussions”. Moreover, the instructor asked her students to select and analyze “case studies and examples” and “work in groups” for better understanding and applications for the course materials.

To turn the lengthy class time from boring to interesting, active and effective class, I’ve broken up the long four hours class into smaller segments, 45-50 minutes each to include short lecture, students’ classwork activities, and students’ presentation.

Furthermore, to achieve the last objective of ‘action research’, which was linking the course material (concerning climatic and environmental design) with the local built environment and specific climate zone in Saudi Arabia and the Arab Gulf region, the instructor designed students’ research to study and analyze green and sustainable buildings in Riyadh and other Saudi cities. Also, search, introduce and include the Saudi building codes concerning green and sustainable design to the course materials. Besides, employing e-Learning and VLE through Moodle, You-tube and emails for after-hours continuous learning.

The post Action Plan evaluation showed excellent students response and feedback, which proved successful design and implementation of the ‘action research’.

7. IMPLICATIONS FOR FUTURE PRACTICE

Positive experience that was gained through planning and executing the ‘action research’ motivated me to continue using the successfully developed strategies in the future such as: tackling the lengthy time of the lectures and laboratory by dividing them to smaller class segments and to include more activities and discussions to engage the students by using the flipped classroom strategies and game based learning methods. The instructor also included more visual aids to the lectures such as animations, videos and YouTube clips to make the lectures more informative and interesting.

Furthermore, the instructor has included more research and group activities to the laboratory sessions, such as PowerPoint presentations by the students and group competitions, posters’ design.

However, there are some teaching strategies that need more attention in planning and implementations. For example, organizing field trips, which need at least four to six weeks of preparations, choosing the relevant site to visit, completing paper work and getting the required permissions from authorities and parents’ consents as well.

Another interesting strategy that needs more exploration, planning and execution, which is Game Based Learning GBL. The instructor/author will plan to have both strategies applied in the next academic semester.

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