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PARALLEL LEARNING METHODS: STANDARD CURRICULUM VERSUS INTENSIVE COURSES

Nabil Mohareb

Associate Professor, Faculty of Architectural Engineering, Beirut Arab University, Lebanon, mohareb@bau.edu.lb

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Abstract

Due to the rapid change in technology and emergence of new theories and their professional applications, there is a rise in demand for relying more on compact and intensive courses with shorter durations and more direct applications, rather than the traditional courses with their long periods of time, which might vary from 14 to 16 weeks of study. Although they are already in existence, this paper aims to demonstrate the need to use more compact courses within the architecture curriculum, particularly simulating tools that either measure the current performance of a design or forecast its degree of success in order to cope with environmental needs (indoor and outdoor), accessibility, visual needs, technological variations and other related issues. The paper investigates the end users' (students and instructors) point of view, by using a questionnaire as a tool. Furthermore, the paper investigates the results of the compact courses on the students' performance in their design projects.

Keywords

Parallel learning methods, intensive courses, compact learning

PARALLEL LEARNING METHODS: STANDARD CURRICULUM VERSUS INTENSIVE COURSES

N. MOHAREB¹

ABSTRACT

Due to the rapid change in technology and emergence of new theories and their professional applications, there is a rise in demand for relying more on compact and intensive courses with shorter durations and more direct applications, rather than the traditional courses with their long periods of time, which might vary from 14 to 16 weeks of study. Although they are already in existence, this paper aims to demonstrate the need to use more compact courses within the architecture curriculum, particularly simulating tools that either measure the current performance of a design or forecast its degree of success in order to cope with environmental needs (indoor and outdoor), accessibility, visual needs, technological variations and other related issues. The paper investigates the end users' (students and instructors) point of view, by using a questionnaire as a tool. Furthermore, the paper investigates the results of the compact courses on the students' performance in their design projects.

KEYWORDS

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1. INTRODUCTION

Architectural practice and education have passed through various stages of development to the present time. The rapid evolution began at the beginning of the twentieth century, starting from the master architect who designs and follows all the stages of the building, down to the minor details of furniture, such as Frank Lloyd Wright, until recently, where the projects have become more complicated, with various studies required. The design team has become larger, with various specialists, and the architect has become a team member and not the only head of the team. The size of the projects is not the only factor for such transformation; there are other issues too, such as globalisation, new materials, environmental awareness, and advances in computation that have heavily affected the way in which the designers, as well as the end users, deal with buildings or urban-scale projects. This transition in practice has affected the pedagogy of architecture in many ways, starting from the course types, duration and content. In order to cope with the existing needs, new courses are frequently introduced to the architecture curriculum in most architecture schools. In addition and due to globalisation, there is a need from developing countries for heading towards validation from international bodies in order for their graduates to compete in the construction market. The most important architecture-related accreditation/validation bodies are, in historic foundation order, RIBA (1834), ABET (1932) and NAAB (1940).

Due to the acceleration in building and technical knowledge in the field of architecture, this paper aims to demonstrate the need to rely more on short courses in the architecture curriculum. The target is the technical courses that use simulating tools that either measure the current performance of a design or forecast its degree of success in order to cope with environmental needs (indoor and outdoor), accessibility, visual needs, technological variations and other related issues.

¹ NABIL MOHAREB

Associate Professor, Faculty of Architectural Engineering, Beirut Arab University, Lebanon
n.mohareb@bau.edu.lb

The paper assumes that the short or intensive courses are more effective, to the point, and their results can be applied directly to related design courses.

The paper begins by reviewing the credit hour system that formats the course duration, and then illustrates the different types of short course and their effectiveness on the outcome of architectural education, followed by highlighting their advantages and limitations. Furthermore, the paper aims to develop criteria for which courses should be selected to be intensive. Finally, it investigates the end users (students and instructors), depending on a local case study at Beirut Arab University, exploring their points of view about the benefits of intensive courses, as well as making some concluding remarks.

2. LITERATURE REVIEW

The credit hour system was designed by the end of the nineteenth century by the American philanthropist Andrew Carnegie to translate high school work to college admissions. This system was clearly explained in Morris L. Cooke's report 'Academic and Industrial Efficiency', which was underwritten by the Carnegie Foundation in 1910 (Scott & Conrad, 1992). The idea is based on a teaching unit that could be compared across time and between institutions. Cooke's report developed a formula to estimate the cost and output of both teaching and research – essentially, 'to measure the efficiency and productivity of educational institutions in a manner similar to that of industrial factories', to consider student transfer and mobility, and to pay attention to the quality and integrity of the collegiate curriculum (Barrow, 1990). To accomplish this, Cooke developed a key unit of measure called the student hour, defined as 'one hour of lectures, of lab work, or recitation room work, for a single pupil' (Barrow, 1990). This measure made possible the calculation of relative faculty workloads, the cost of instruction per student hour and ultimately, the rate of educational efficiency for individual professors, fields, departments and universities.

The second main evolution in the course module was the introduction of the elective system. In 1869, Charles W. Eliot, a member of the trustees at the Carnegie Foundation, introduced the elective system at Harvard University. Eliot saw electives as an inducement for students and a means for them to examine the topics in which they were talented or interested. The change from a standard curriculum to the elective system fundamentally altered the content of the college degree, from something awarded based on the mastery of a comprehensive curriculum to the successful completion of a series of courses. Eventually, providing choices led to the creation of majors and minors, academic departments and the specialisation of scholarships (Shedd, 2003). As a result, the credit hour system became the coin of the realm in higher education measurements for both the academic and administrative (Erlich, 2003; Lutes & Davies, 2012).

Intensive, compact or short courses are all terms to describe a course that is provided over a shorter period of time than the traditional course, which lasts between 14 and 16 weeks. This type of course is currently familiar in most course offerings – for example, summer courses. They are gaining more popularity, due to the need for flexibility to accommodate a growing non-traditional type of student, in addition to the economic drivers (Collins, Hay, & Heiner, 2013).

There are five types of short course (Scott & Conrad, 1992), which are highlighted as follows:

1. Summer sessions: typically last from three to eight weeks;
2. Interim sessions;
3. Modular calendar systems: the academic year is divided into five to ten modules and students concentrate intensively on one or two courses each term;
4. Regular term: intensive courses offered during the regular semester;
5. Weekend format (workshops): courses can be compressed into two weekends and still amass up to 40 hours of classroom time.

Research on creativity and subjective experiences suggests that intensive periods of concentrated study may benefit students in ways not yet understood. Walberg (1988), whose research has explored the origins and nature of creativity, suggests that 'deep concentration', 'immersion' in an activity and 'undivided intentionality' lead to intrinsically rewarding 'optimal experiences', which nourish and strengthen the self (Walberg, 1988).

Research indicates that the relationship between time and learning is less than clear-cut. For example, Karweit's (1984) review of the time and learning literature concluded that 'time is a necessary, but not sufficient, condition for learning' (Karaweit, 1984). Walberg's (1988) review concurred, and further emphasised that time in and of itself is only a 'modest' predictor of achievement. Other factors, including 'student aptitude', 'quality of instruction', the amount of 'productive classroom time' and the classroom and home environments, are equally important to achievement (Walberg, 1988).

The vast majority of research on intensive learning indicates equal if not superior short-term results for intensive courses, regardless of the discipline or field of study under investigation (Daniel, 2000). However, certain disciplines and fields of study may benefit from intensive formats more than others. A survey carried out at the University of West Georgia, comparing over 45,000 students, recorded achievement over the typical 16-week fall and spring semesters, as well as the summer semester, which includes variations of three-, four- and eight-week sessions. The results show that shorter semesters significantly increased student performance in comparison to the performances achieved during longer, traditional, 14-to-16 week semesters; furthermore, the four-week semester provided the optimal student performance (Austin & Gustafson, 2006).

2.1 Advantages of Intensive Courses

An intensive course has many advantages, suggested by a growing body of research; it improves the students' experiences and can be as effective as traditional-length units in term of learning outcomes (Scott, 2003). To explain why the performance is better in some intensive courses than when using the standard format, Scott (2003) suggests that the classroom relationship and classroom atmosphere are two important factors for a successful intensive course, as is more meeting time between the instructor and the students in a fewer number of weeks (Scott, 2003). It provides more non-teaching time to the academic staff, to enable them to focus on research (Hesterman, 2015). From an economic point of view, the campus resources are used more efficiently when used for extra study periods (Hesterman, 2015).

2.2 Limitations of Intensive Courses

On the other hand, there are some limitations to the intensive courses. Faculty members often criticise the compact courses; they argue that the compact courses are scarifying the breadth of knowledge and reducing academic rigor (Hyun, kretovics, & Crowe, 2006). Daniel argues that the disadvantages accompanying intensive courses include fatigue for both the instructors and the students, inadequate preparation time (lectures and assignments) and insufficient time for students to synthesise course content (Daniel, 2000).

Intensive courses are not suitable for all subjects, in particularly those courses that are 'content and comprehension rich' (Whillier & Lystad, 2013). Whillier and Lystad argued that when elements have been recently studied, working memory is incapable of highly complex interactive and integrative activity (Whillier & Lystad, 2013). The relationship between memory and learning in intensive courses is a vital factor in deciding which courses should be intensive and their duration periods. In order to measure this factor, incubation time as a process is an important aspect for measurement. This is a method of ruminating on a problem for an extended period of time. Highly intensive courses in some topics may not provide enough incubation time (Tatum, 2010). Therefore, compressing the time between initial delivery and the final test may enhance the short-term performance at the expense of compressing long-term retention (Hesterman, 2015).

There is a greater challenge to some students who already have difficulties in standard-length courses to fulfil the demands of the intensive course (Collins et al., 2013). Therefore, a number of studies recommended limiting the intensive courses to two courses concurrently, in order to reduce the risk of overloading the students and affecting their performance (Whillier & Lystad, 2013).

2.3 Best Practice

Kops (2014) has established a number of important best practice points that consider achieving high performance and product outcome from intensive courses; they are summarised in the following points (Kops, 2014):

- Shifting the focus from content delivery to learning outcomes;
- Emphasising depth over breadth;
- Tackling complex topics earlier in the course;
- Breaking down traditional longer assignments into smaller linked assignments that build on each other;
- Varying assessment to cater for student diversity;
- Thorough preparation by instructors for conducting intensive courses;
- Effective use of in-class time;
- Shifting from information-giving to interactive activities that clarify and apply course content;
- Considering adequate class size – a smaller class size would be a positive attribute to intensive courses.

From the outcome of the literature review, intensive courses are widely used for different disciplines and their results are equally acceptable to their equivalent standard courses. However, there are some concerns regarding their application, from both the instructors' and the students' points of view. There is a little research on this subject in the field of architecture/ engineering, and even fewer analyses in the Arab higher education system. The next section explores the application of intensive courses in the Faculty of Architectural Engineering (Tripoli Campus) at BAU University, and the possible implications in terms of maximising the benefits of intensive courses.

3. CASE STUDY ANALYSIS

The analytical section comprises two subsections. First, the paper investigates an analysis of the outcomes of two different types of courses, through both intensive and standard modules. This comparative investigation examines the performance of students, revealing whether there are clear-cut differences in their outcomes and achievements. The second subsection highlights the end users' points of view about intensive courses; instructors and students are both interviewed using a questionnaire system.

3.1 Comparative analysis between standard and compact courses at BAU University

The only intensive courses offered at BAU University are in the summer semester, which lasts eight weeks. Since no design or construction courses are offered in the summer, this paper chose two mandatory courses related to the Faculty of Architectural Engineering (Tripoli Campus). They are two credit hour modules, with two-hour meetings in the standard format.

Points of comparison were set to understand the gender enrolment in the course compared to the number of students in the faculty; the number of students passing the course; the average grade of the course; the number of students gaining GPA above and below C (70%); the standard deviation; and, finally, the number of students passing or repeating the course (see Table 1).

The two courses were 'ARCH 335 History of Architecture III', which is a theoretical research-based course and introduces Islamic architecture, and 'ARCH 298 Indoor Environmental Control', which is a more technical-oriented course. The paper tracked the record of four successive semesters of the history course, of which the same instructor supervised three, while the indoor course was offered only once as a summer course, which is why it was only tracked for two semesters. The course outline, ILOs (intended learning

outcomes) and number of assignments were almost the same in both intensive and standard course format. The following observations are extracted from Table 1:

- Male students tend to enrol more on summer intensive courses compared to their number of enrolments on standard format courses;
- Passes on the course in both formats are almost the same – even when there are differences, they do not represent a pattern, such as in the course ‘History of Architecture III’ Table 1 [f];
- The percentage of students that gained grades of less than 70 (GPA C) is lower in summer courses (see Table 1 [i]);
- The average grades of summer courses are slightly higher than those of standard courses (see Table 1 [j]);
- The average grades improved in the summer courses under the supervision of the same instructor in ‘History of Architecture III’;
- Even when having the same number of students in both versions of the course, the average, standard deviation and number of passing students are still almost the same in ‘Indoor Environmental Control’ course.

Table 1 highlights two different courses offered through 15- and eight-week durations at the Faculty of Architectural Engineering, Tripoli Campus. Both courses are mandatory.

Reference: author

	ARCH 335 (Fall)				ARCH 298 (Spring)	
	History of Architecture III				Indoor environmental control	
	15 [*] weeks	8 weeks	15 [*] weeks	8 [*] weeks	15 weeks	8 weeks
Academic year	2012-13	2012-13	2013-14	2013-14	2014-15	2014-15
a. Enrolled Male students to the Faculty (%)	41.5	41.5	52.73	52.73	45.24	45.24
b. Enrolled Female students to the Faculty (%)	58.5	58.5	47.27	47.27	54.76	54.76
c. Students enrolled (number)	16	23	12	17	19	19
d. Male students (%)	37.5	52.17	16.67	41.17	36.84	47.37
e. Female students (%)	62.5	47.83	83.33	58.83	63.16	52.63
f. Passed Students (%)	75	100	100	76.47	89.47	84.21
g. Failed students (%)	25	0	0	23.53	10.53	15.79
h. GPA C (70) and Above (%)	50	78.25	50	58.81	52.63	52.63
i. Below GPA C (70) (%)	50	21.75	50	41.19	47.37	47.37
j. Average	65.31	78.87	69	70.88	70	69.89
k. Standard deviation	10.92	8.76	7.86	14.12	12.85	11.63
l. Repeating the course (number)	0	2	0	0	6	1
m. Passing the course (second time) (%)	0	100	0	0	66.67	100
n. Failing the course (second time) (%)	0	0	0	0	33.33	0
* Courses given by the same instructor						

The comparative analyses observations from Table 1 reveal that students enrolled in intensive courses have equal or even better performance compared to standard modules. In addition, these results from mandatory intensive courses in Architectural Engineering are aligned to the advantages in the literature discussed earlier in this paper, which suggests that using intensive courses in architecture as a major is not different to the results from other

disciplines. However, this section does not clarify the concerns or needs of the main end users, instructors and students; therefore, the next section investigates this point.

3.2 Concerns about intensive courses

To apply an intensive course successfully, both end users – the course instructor and the students – need to work together effectively. Their opinions should be considered when designing and selecting the appropriate course to be in intensive format. In order to understand the students’ needs and concerns, an online semi-closed questionnaire was introduced to 99 randomly selected students of the Faculty of Architectural Engineering (Tripoli Campus), representing 55% of the total students enrolled in the faculty. There was a 68.7 % response rate to the questionnaire (68 students), representing 36.6% of the total students in the faculty. The number of females exceeds the number of male students, with varying levels of study; see Figure 1 (A and B).

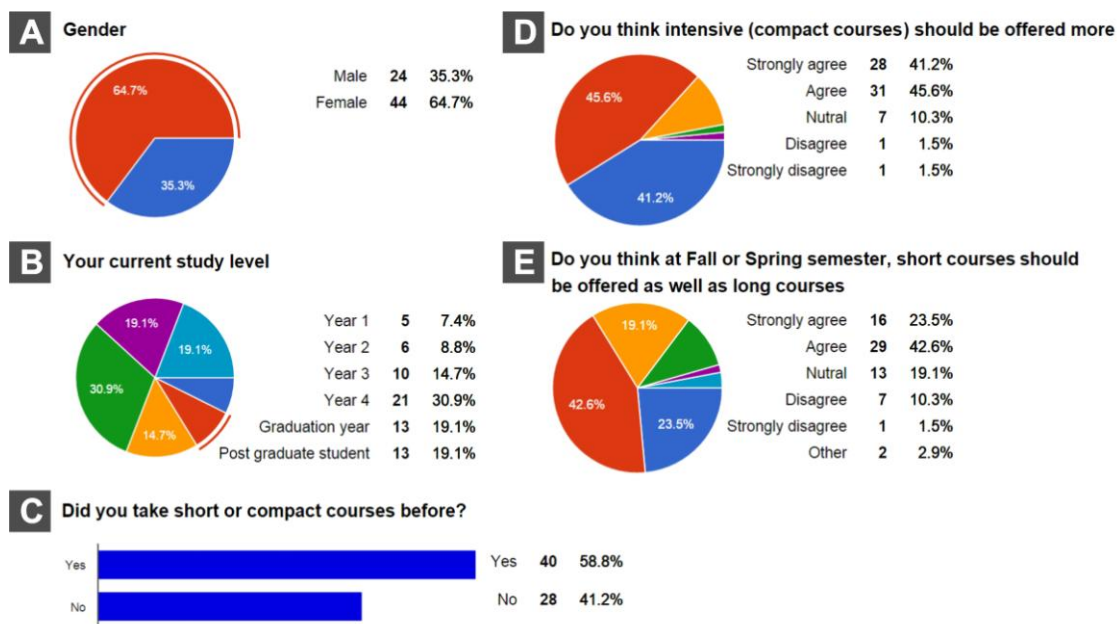


Fig. 1 A, B and C show the participants’ genders, closely resembling the ratio of male to female students enrolled in the faculty branch, and their level of study, in addition to whether they have taken compact courses before or not. Charts D and E illustrate the students’ opinions about offering short courses.

Reference: author

There are some important observations to be made from the questionnaire, illustrated in Figures 1 and 2; they are summarised as follows:

- The majority of students (86.8 %) are in favour of short courses being offered more within the architectural curriculum – this high percentage is still valid among students who have previously taken intensive courses (85 %) (see Figure 1 [C and D]);
- Regarding the time to offer such intensive courses, 58% of the students prefer to have both course formats offered concurrently in fall and spring semesters and not only proposed in the summer semester (see Figure 1 [E]);
- The current eight-week intensive courses in BAU University still possess the highest percentage (50%) of the preferred duration of an intensive course, followed by the six-week duration (35%) (see Figure 2 [A]);
- However, computer-based courses, such as CAD courses, are considered as acceptable to being taken in three-weeks durations (see Figure 2 [B]);
- The questionnaire reveals that history courses (35.8%), computer-based courses (34.3%) and selected topics in architecture (such as vernacular architecture, urban morphology

and other related courses) (29.9%) have the highest percentages among the graduate and undergraduate students suggesting them to be offered as intensive courses (see Figure 1 [C]);

- Based on the responders' opinions, 63.2% think that taking intensive courses makes them concentrate more on the mandatory courses, while 47.1% wants to finish their studies earlier or on time by taking intensive courses, or even to have the ability to retake the course if they do not pass the first time (38.2%) (see Figure 2 [D]).

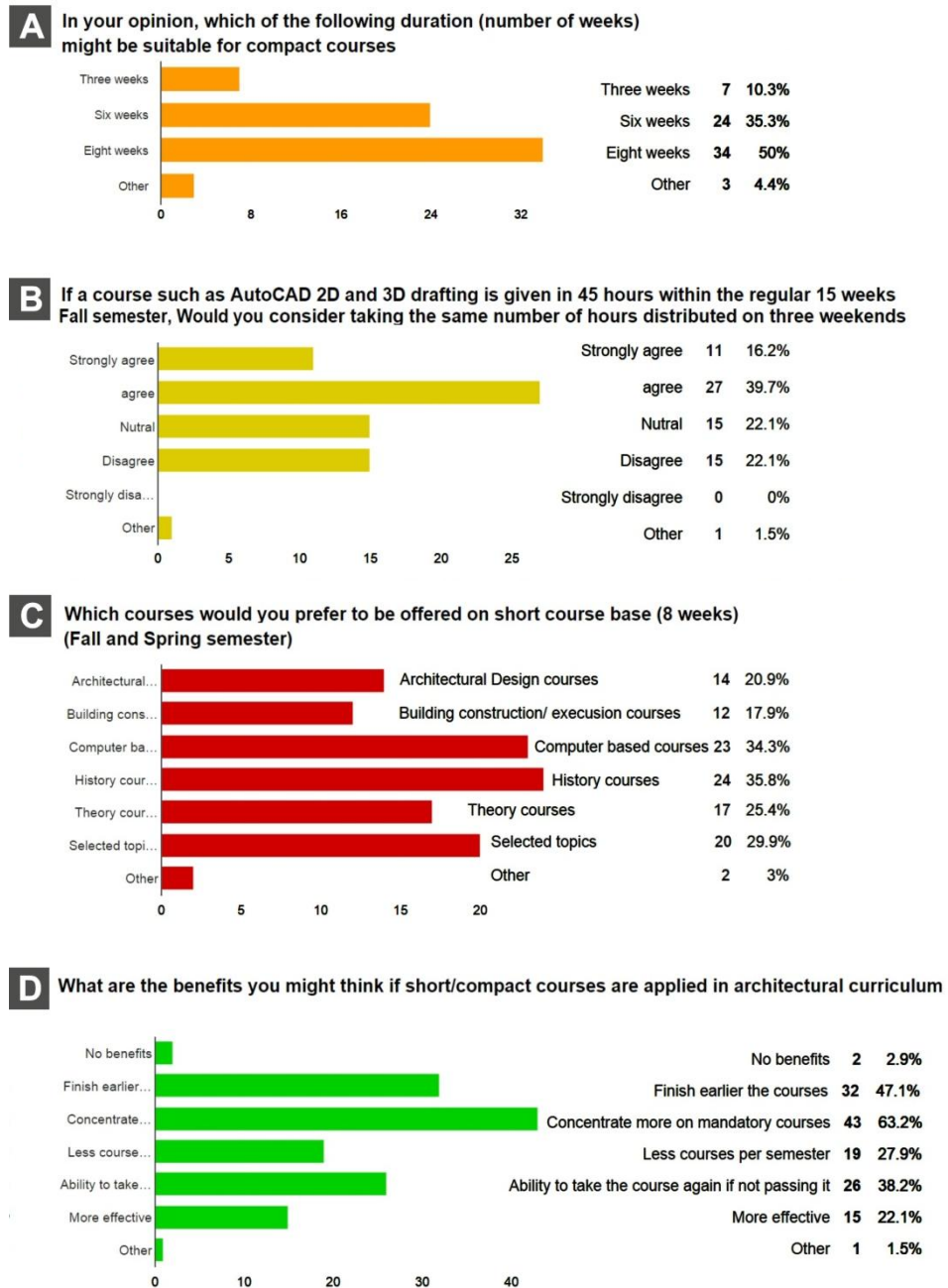


Fig. 2 A, B, C and D bar charts highlight the students' opinions about the duration of the intensive course (A) and (B), and which courses they would prefer to take as an intensive course (C), in addition to the extent to which these courses might benefit them (D).

Reference: author

The questionnaire also contained open questions regarding the students' main concerns about intensive courses. In addition to this, another interview was held with instructors at BAU University; this is addressed in Table 2. Four points of concern appeared repetitively: time availability; breadth and depth of data provided within the intensive course; evaluation methods; and the level of stress for both end-users the instructors and the students (see Table 2).

Table 2 shows four points of concern about intensive courses from both points of view: the students and faculty members. These points are extracted from an online questionnaire for the students and semi-closed interviews with the faculty members.

Point of concern	Reference: author	
	Students' concern*	Instructors' concern*
1. Time availability	<ul style="list-style-type: none"> - Reviewing time of course material - Studying all the materials - Need time to practice more 	<ul style="list-style-type: none"> - Compressed time to prepare the course materials (lectures, quizzes and others) - Time for discussions and student presentations - The information is still fresh and could be built over.
2. Breadth and depth of data provided	<ul style="list-style-type: none"> - The huge amount of information given in respect to time - Might need previous knowledge about the subject to pass it smoothly - The breadth and depth are relative to the type of course 	<ul style="list-style-type: none"> - Practical sections and on-site visits will be cut down or shortened - Levels of detail and in-depth discussion are questionable
3. Evaluation methods	<ul style="list-style-type: none"> - Short time to submit the required assessments 	<ul style="list-style-type: none"> - Need new methods of evaluation
4. Level of stress	<ul style="list-style-type: none"> - Stress to finish all the requirements in less time - Easier to concentrate on one subject at a time 	<ul style="list-style-type: none"> - Degree of student comprehension in compressed lectures different from one student to another - Very stressful for following up the students' progress - Need more concentration from the student and instructor
	* Online closed questionnaire for 68 students from the Faculty of Architectural Engineering, Tripoli Campus, 2016	* Semi-closed interview for six faculty members, 2016

Based on the previous questionnaire and discussions, the paper proposes a framework for selecting which course should be considered for the intensive format (see Figure 3). Courses that need accumulative design experience and are research-based should be considered for the standard format, while courses that are related knowledge-based, computer-based and on unilateral topics can be offered in an intensive format.

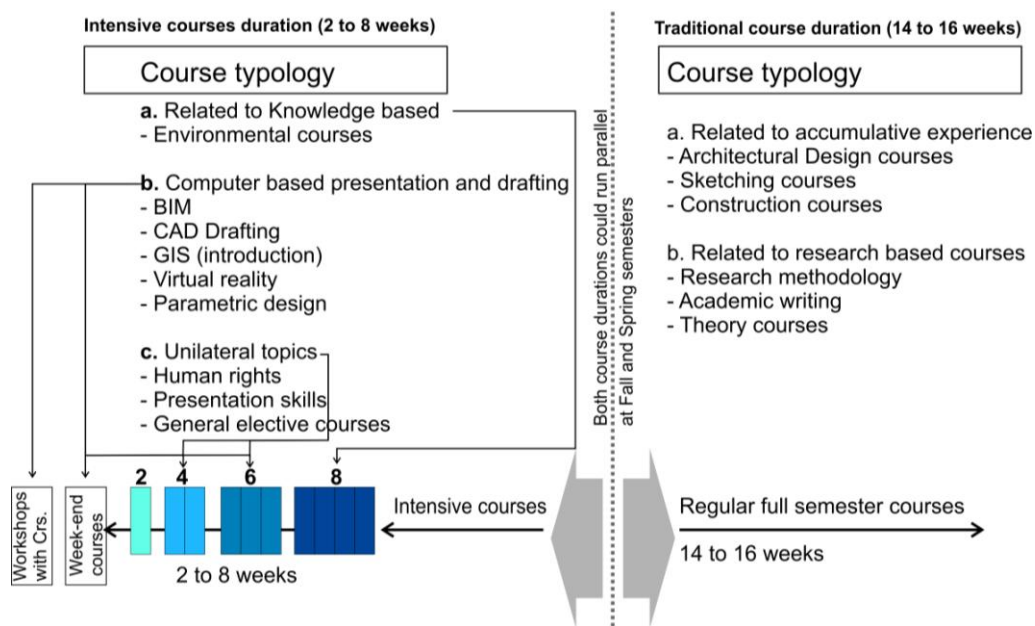


Fig. 3 highlights the suggested framework for designing the course length according to the course typology – whether to be designed for the traditional duration or based on the intensive mode.

Source: author

4. CONCLUSIONS

Intensive courses should be introduced more in the architecture discipline; however, not all courses should be designed in an intensive format. When questioning the effectiveness and the need for intensive courses, the current situation in the Faculty of Architectural Engineering, BAU University, highly resembles the outcome from the literature review of other disciplines and cultures.

There are enormous opportunities for relying more on intensive courses to cope with the rapid change in technology. There is a need to concentrate more on the depth of the information and the direct group application in class, rather than the elongated breadth of the course content.

This is ongoing research, as more questions need to be addressed to wider audiences, not only within one university, but extended to all Lebanese universities and even addressed to other Arab universities, in order to gain a comprehensive perspective on the best practice that can be applied in this region. Furthermore, the accreditation and validation bodies for architecture such as RIBA, ABET and NAAB, should encourage such trends.

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