

Exploring Andragogic Strategies in an Interior Architecture Studio الاستراتيجيات الأندراجوجية في تعليم تصميمات العمارة الداخلية – دراسة استكشافية

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ABSTRACT

New design andragogic strategies require different interior architecture settings to accommodate a new educational delivery. hence, learning settings are decreasingly formal timetabled classroom-based and increasingly collaborative and socially peer to peer oriented. The literature review reveals that the most recent comprehensive andragogy is interactive collaborative learning that can be achieved by live projects and vertical studios in interior architecture and across disciplines. The method of research is an exploratory comparative case study in the form of a one-day five hours workshop with aim to assess the outcome of two interior architecture vertical studios in different educational settings (physical and virtual). analysis of outcome is based on behaviour mapping of the students at work, a qualitative description of their selected setting layout and their opinion on the workshop. In conclusion, a graphical model illustrates the idea that together, andragogic strategies, collaborative activities and supportive educational settings optimize the educational process.

KEYWORDS

Andragogic Strategies; Live Simulation Project; Vertical Studio

المخلص

يتطلب تطبيق الاستراتيجيات الأندراجوجية في تدريس تصميمات العمارة الداخلية، إيجاد حلول تصميمية للبيئة الدراسية تساعد على التقليل التدريجي من الإ اعتماد على الفصول الدراسية التقليدية المتداولة ليعتمد أكثر على التعاون والتضامن بين الطلاب. وتكشف العديد من الدراسات السابقة والمرتبطة أن أحدث وأشمل طرق التعلم هو التعلم التعاوني التفاعلي، والذي يمكن تحقيقه من خلال المشاريع الواقعية والمراسم الرأسية في العمارة الداخلية وعبر التخصصات. تتضمن منهجية البحث دراسة حالة مقارنة استكشافية عن طريق ورشة عمل لمدة خمس ساعات ليوم واحد؛ وذلك بهدف تقييم نتائج مرسمين رأسيين للعمارة الداخلية في بيئات تعليمية مختلفة (واقع حي – واقع افتراضي). ويعتمد تحليل النتائج على رسم الخرائط السلوكية للطلاب أثناء العمل، وعلى تقديم وصفاً نوعياً لحيزات العمل المنتقاء وطريقة التأثيث، كذلك آراء الطلاب عن المهارات التي اكتسبوها وعن انطباعاتهم بالنسبة لورشة العمل. نتيجة البحث هي نموذج جرافيك يوضح أنه من أجل الحصول على عملية تعليمية أفضل يجب تحسين استراتيجيات التعليم من خلال الأنشطة التعاونية والحيزات التعليمية الداعمة.

الكلمات المفتاحية

الاستراتيجيات التعليمية الأندراجوجية؛ محاكاة المشاريع الواقعية؛ المرسوم الرأسية

1. INTRODUCTION

Nowadays, an ongoing state of transformation in living and learning styles is due to rapid technological advances, globalization, and the emergence of collaborative patterns of work, research, and education (Wright & Wrigley 2017). It is also evident that most literature on new educational methods focus on self-learning guided by educators, a matter that promotes creative thinking and self-reliance, rather than teachers indoctrinating their students. Hence, in the education environments, learning settings are decreasingly formal timetabled classroom-based, all relating to one person, the teacher, or the educator, and increasingly changing into collaborative and socially peer to peer oriented (Fisher 2004; Saghafi et al. 2012). Interior architecture is always developing to meet the needs of the 21st century rapid progression; it is in a continuous state of change as when occupants use the spaces, constant alterations occur in relation to time. Similarly, innovative andragogic strategies develop to meet the increasing relentless changing needs of the professional practice. The system is now changing from pedagogy into andragogy with new strategies to meet the ever-increasing needs of keeping pace with the new developments.

1.1 Definition of Terms

Andragogy is referred to as the art and science of assisting adults acquire knowledge. Therefore, it is considered as learner-focused education, while pedagogy is regarded as teacher-focused education (Conner 2004). Andragogy roots from the greek word –agogus—meaning ‘leading’, ‘andra’ translates as the word adult; on the other hand, ‘peda’ or “paid” translates as child, which defines pedagogy as the art and science of teaching children (Knowles 1980; Conner 2004; Taylor & Kroth 2009). The emphasis on the process rather than content is one of the main characteristics of andragogic principles where educators are considered to be facilitators. Self-directed study instills the role of the teacher from being a simple information provider to a guide that supports lifelong learning. The facilitators do guarantee that the learning environment provides teaching/learning situations that are collaborative, supportive, open, authentic, pleasurable, and learner centered.

1.2 Problem Statement

Until recently, the system of education in Egypt has followed pedagogic strategies in adopting passive techniques like lectures, seminars and demonstrations, and where assessment is primarily founded on the ability to memorise. Similarly, in the traditional interior design studio, the method has relied on a one to one teacher-student instruction with a focus on problem solving projects at the individual level, based on formal design skills and on historical and technical knowledge. Occasionally, efforts were spent on implementing new andragogic strategies of collaborative learning. Mixed levels studios have been used earlier in the period between 1940s and 50s as models adopted from the Ecole des Beaux Arts in Paris and, where students of different academic levels would sit in one space, but each level had its own project, they would not work together but they were cognizant of each other’s projects; a fact that gave opportunities of interactions between them and encouraged peer to peer informal learning. This form of informal collaborative learning has ceased to continue with the advent of both an outgrowing number of students of interior architecture, and of more restricted spaces to follow a more detailed and diversified curriculum where each academic level is assigned a different space, or same space at different times. Today, in our world of globalisation, there is an urge to adopt new education systems in Egypt, thus the

use of active andragogic strategies whether in physical or virtual spaces becomes eventually a model to be endorsed and reviewed. The questions to be raised, investigated and answered are:

- *What are the andragogic strategy that would better conform to the optimisation of interior architecture education?*
- *What are the types of compatible interior environment settings that would better fit an adopted andragogic strategy?*
- *What would be the impact of adopting an andragogic strategy on students' attitude and behaviour?*

1.3 Aims and Objectives

The aim of this study is to diagnose the consequences of using andragogic strategies in an interior architecture studio in relevance to conformity and optimisation of interior architecture education, to compatibility of interior architecture environment settings and to students' attitude and behaviour. The objectives are to highlight primary indications of passive and negative aspects of the findings, analyse the method of research and indicate its constraints if exist to formulate broader in-depth new research studies for further development of applying the suggested strategies

2. ANDRAGOGIC STRATEGIES

The literature review reveals that there are many recent andragogic studies that are experimented in interior architecture education; some are considered to align along the discipline as fostering an *Integrated Project Delivery - IPD*, that implements high efficiency by conveying accurate information and new technologies in a collaborative team environment. Students of interior architecture would work with architects and with mechanic and structure engineers in one project. Such an approach would help develop the talents and insights of all the project participants, to optimize project results, to increase value to the owner and to reduce waste and maximize efficiency through all the project phases (AIA, 2007).

Most of the recent andragogic studies do encourage immersing the students in the professional/community field as they progress in their studies; hence, live projects are considered an effective approach that could enhance the educational process. Terminologies have always been an issue within the live project; it is used interchangeably with other educational strategies that are similar in some respects with the live projects yet different in others. For example, Salama (2015) clarifies the differences stating that “while *community-design* pedagogy places emphasis on decision making as well as enhancing political and negotiation skills, *design-build* pedagogy relies heavily on teamwork, team building and construction in order to provide students with opportunities to develop practical vocational skills”. On the other hand, Sara (2006) considers *community-based* projects and *design-build* projects as types under the umbrella of *live projects*. In this perspective, Anderson (2017) added the term *service-learning* along with *design-build* projects as interchangeable terms to *live projects*. *Service-learning* is an educational experience in which students participate in an organized service activity in such a way that meets identified community needs (Bringle & Hatcher 1995).

Therefore, the presented literature review here-above reveals that the most recent comprehensive andragogy is interactive collaborative learning that can be achieved by live projects and vertical studios (mixed academic levels working together in the same project) whether in the discipline of interior architecture or across disciplines (Emam et al. 2019; Peterson & Tober 2014; Psarologaki 2014).

2.1 Live Project and Live Project Simulation

The ‘live project’ is distinctive from a traditional studio project in its engagement of real users, in real-time context. This explorative experience adds to the students the know-how of dealing with clients. Live projects can be based on providing ideas, feasibility research, completed design scheme or even construction implementation. They develop a mutual benefit relationship between an educational entity and an external collaborator through a shared project with specific brief, timescale, and budget. In this context the educational process becomes immersive to the students (Sara 2006; Salama 2015; Rodriguez et. al 2018). To date, live project andragogy has not been a part of mainstream interior architecture andragogy research, although in certain academic contexts, it is an integral component of the architecture curriculum and has been presented as an alternative andragogic approach (Butterworth 2013). It is also remarkable that most of the literature in spatial design that developed an extensive critique and elaborative analysis on the live projects are in the field of architecture. Live projects need excessive planning and too many resources which are beyond the capabilities of some institutions, hence the adoption of a propositional ‘live project simulation’ helps in creating features of a real live project.

2.2 Vertical Studio

The ‘vertical studio’ is a term used to define the removal of the institutional barriers, mixing undergraduate students from different academic years while working on specific projects (Psarologaki 2014). The key goal is to create an environment in which students compete and support each other by exchanging knowledge and enthusiasm (Özbek et. al, 2018). A vertical studio approach presents diverse experiences into same studio environment, allowing more observation and imitation to take place (Layden 2010; Peterson & Tober 2014).

The vertical studio was adopted by many spatial/visual related courses; for example, in 2004, the University of Bedfordshire, UK, restructured its interior architecture and interior design programs to incorporate the vertical studio (Layden 2010). At the Norwegian University of Science and Technology, Department of Product Design, a concept of ‘Vertical Learning’ within a studio environment was planned and implemented in conjunction with systems design (Liem 2012). Additionally, Peterson & Tober (2014) conducted a test run and subsequent institutionalization of the vertical studio in the Graphic Design program at the University of Illinois at Urbana-Champaign. These were attempts to create collaborative environments in which students can assist each other; therefore, the vertical studio is not considered a brand-new andragogic strategy but a renewed one.

2.3 The Virtual Design Studio

The Virtual Design Studio (VDS) is defined as a studio distributed throughout time and place. The VDS teaching activities take place within a computer-mediated environment connecting students as if they belong to the same physical studio environment. The use of asynchronous tools enable participants to interact and share information asynchronously by storing and retrieving data from a shared location with the freedom of access to their own time whilst synchronous tools allow the students to interact simultaneously through their computers in a live manner (Al-Qawasmi 2006). There is still a huge debate around the success of the VDS; studies in the early 2000’s emphasize that the main motivation of the VDS is to connect designers and facilitators from different geographic areas in which they are encouraged to collaborate and to exchange knowledge (Danahy & Dave 2000). In this manner the VDS was reviewed and analyzed to enhance the interior architecture education process. However, the mandated switch of the whole educational process

to the VDS in the COVID-19 pandemic put the main VDS motivations into question; researches highlighted that students prefer the traditional studio and the face to face interactions with their facilitators and peers (Groover & Wright 2020). Likewise, Saghafi et. al (2012) forecasted that: “taking the whole course online would lead to a lack of involvement in a learning community.” Post COVID-19 pandemic decisions in the academic education is to push forward for blended design studio as a hybrid model so that the positive aspects of the VDS would not be lost.

2.3 Studio teaching collaborative activities:

Significantly, these types of andragogic strategies share similar emphasis on teamwork as exemplified by studio teaching collaborative activities; that is through co-learning, open discussions, and co-creation. Co-learning is defined as “collaborative open learning” (Freire 1986; Smith 1996). It is the concept of acquiring knowledge generated by participants. Educators consider that learning in teams succeeds to attain to students’ development of interpersonal and critical thinking skills (Gokhale 1995). As peer learning is a reciprocal learning activity involving the exchange of ideas and experiences between students, co-learning activities intend to encompass students’ abilities to work with each other’s, nurture critical enquiry and reflection, communicate knowledge and develop understanding (Boud et al., 2002). The importance of these skills in design education is clear, while students need to be able to work with their peers, they clearly articulate their design ideas, and critically reflect on their own work and the work of others. They acquire abilities in collaborative environments in which they are expected to be exposed to in their future practices. Collaborative learning activities are to increase motivation and engagement of students. Therefore, open discussions and critiques are long-standing traditions in design education. During open discussions students are encouraged to confidently express and present their work in front of their instructors and peers thus, encouraging students to discuss the designs being presented. (Emam et al. 2019). Discussions enable students to critically deal with different cultures, ideas, philosophies, and ways of thinking and to further use this cumulative exposure to form personal visions, generate their interpretations of a built environment and provide support for users. (Galil & Kandil 2015). The idea of creating a learner-centered approach in which students are a source of knowledge, has direct effect on their learning efficiency. Bovill (2020) suggests that co-creation in the educational context implies a strong collaboration between students and staff, where students become more active participants in the learning process. Students can then integrate their learner-centered experiences to create user-focused spaces. Co-creation is not only between peers or students, but also with the users and stakeholders. Interior architects have been moving increasingly closer to the future users by immersive design research expeditions where codesigning with the users becomes essential. Bringing co-creation into design practice changes how interior architects design, what to design, and whom to design for (Sanders & Stappers 2008).

3. METHODOLOGY

The method of research is an exploratory case study in the form of a one day workshop in an attempt to apply andragogic strategies of a live project simulation in a vertical studio (mixed academic levels), to assess the outcome of two interior architecture studios in the same Design School and same Department of Interior Design: the first as a physical studio at the University premises and, the second as a virtual studio through ZOOM. The students were asked to design an efficient setting for their interaction. Instruments of data gathering were participant observant, annotations, photography, questionnaires on students’ level of satisfaction about the educational strategy and the studio spatial setting, and an open discussion between facilitators and students at

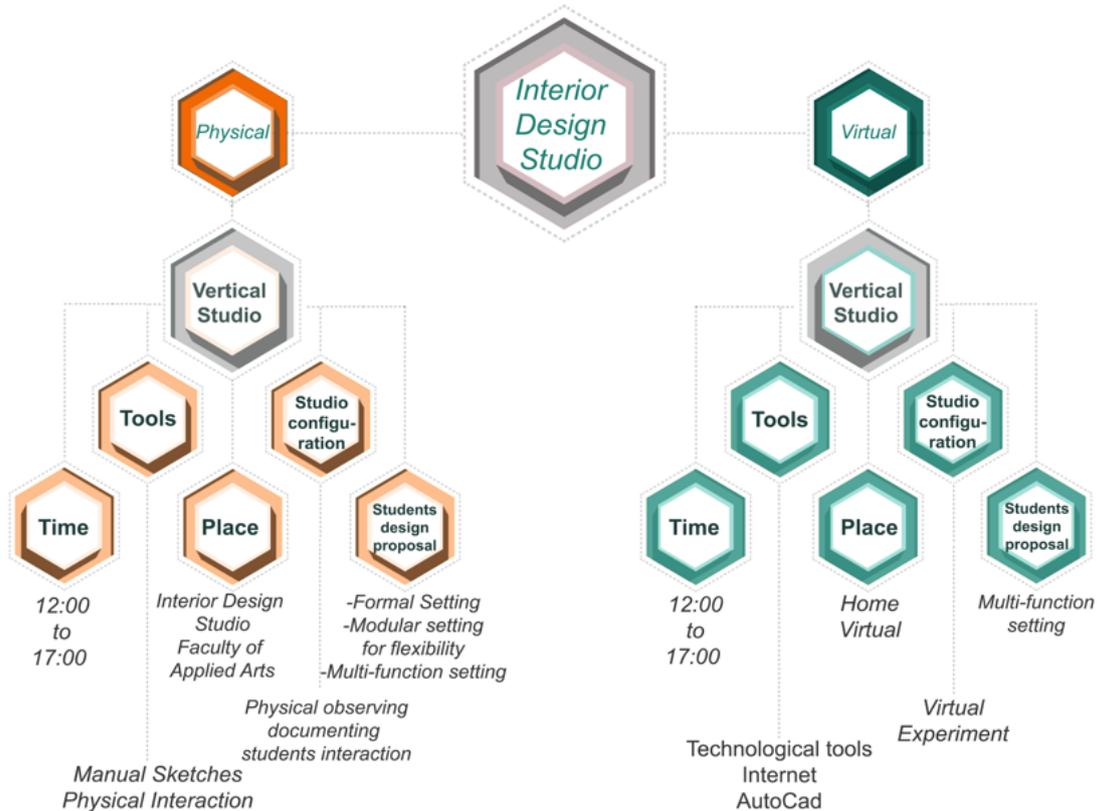
the end of each workshop. The analysis of outcome is based on behavior mapping of the students at work, on their design output, and a qualitative description of their selected setting layout and their suggestions.

3.1 Research Constraint

The method of research as originally conceived was a multi-method approach to assess the outcome of three interior architecture studios in three different Design Schools in their physical premises, with different andragogic strategies (vertical studio, live simulation and across disciplines) in focus groups and to find out appropriate types of furnishing settings that could best support the educational andragogic deliveries. Only one live project was achieved in a physical studio at Benha University. Unexpectedly, with the confinement due to the advent of Covid 19 pandemic, the methodology had to be changed; thus, the decision was to work with the same University students virtually and compare the outcome. This led to another drawback, the control of students' number in the virtual workshop who were only 27 students whilst they had reached 168 students in the physical workshop.

4. ANALYSIS OF AN ANDRAGOGIC STRATEGY – CASE STUDY

*Flow Chart (1): distinction between the vertical studio in physical and virtual conditions
(Source: the authors)*



Students from all academic levels of interior design at the Faculty of Applied Arts, Benha University in Egypt were invited to participate in a one day, five hours workshop of a Vertical Studio; one at the University premises (physical) on 16 February 2020, and the other online through ZOOM (virtual) on 16 April 2020 (Flow Chart 1). Students were asked to redesign their studio in a manner that will help them use the space more efficiently- as they are the actual users

of the space (Live Project Simulation). They were free to create a setting in which they can work collaboratively and/ or individually.

4.1 Structuring the vertical studio

The studio where the study occurred is a trapezium shape defined as a formal timetabled classroom with a few numbers of large heavy tables, and other small mobile ones; it is classified as a teacher-centered classroom with individual learning activity where the students from various academic levels work in an independent education delivery (Figure 1).

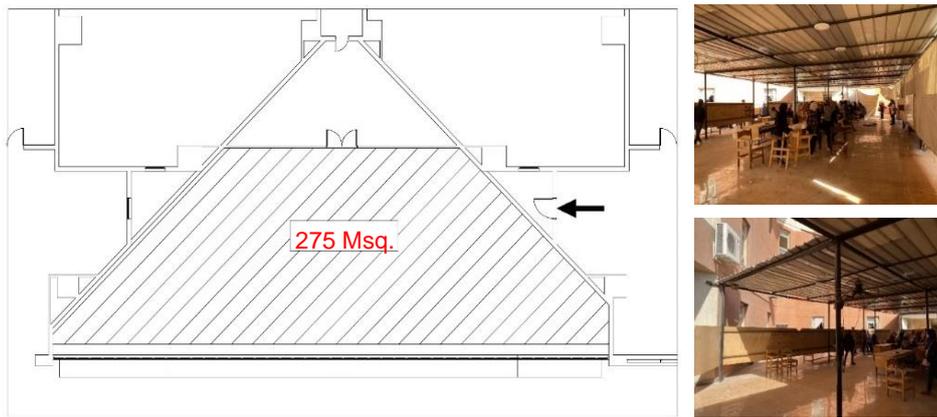


Figure (1) shows the horizontal plan and two photos of the studio where the study occurs (source: the authors)

4.2 Participants

To perform the workshops, groups of student participants were created in the following manner:

- Each group consisted of various educational academic level.
- The students worked collaboratively.
- The groups' sizes 'close in number'.

The participants of the physical vertical studio were 168 students (Table 1), and those of the virtual vertical studio were 27 students (Table 2).

Table (1) showing the distributions of groups in physical vertical studio

Group	Level 1	Level 2	Level 3	Group	Level 1	Level 2	Level 3
Group 1	6	8	2	Group 7	8	2	1
Group 2	4	9	2	Group 8	5	5	1
Group 3	7	5	1	Group 9	14	3	1
Group 4	5	6	1	Group10	2	9	1
Group 5	10	6	1	Group 11	12	6	1
Group 6	7	6	2	Group 12	4	5	1

Total of 168 Students.

84 Students from Level (1), 70 from Level (2), and 14 Students from Level (3).

Table (2) showing the distributions of groups in virtual vertical studio

Group	Level 1	Level 2	Level 3
Group 1	3	3	3
Group 2	3	3	3
Group 3	3	3	3

Total of 27 Students.

9 Students from Level (1), 9 from Level (2), and 9 Students from Level (3).

4.3 Instruments Overview / Study Tools:

The study was analyzed in three main aspects:

Studio configuration: An observation of the students’ interactions with each other was documented in a timeline for both experiments (Fig. 2 & Fig. 3). In the physical case, the formation and grouping of the students in relation to the use of space was also documented in a behavior mapping (Fig. 4). In the virtual case, students interacted with each other through zoom application during the experiment time although they did not know each other but, they had no problem in starting to work directly and communicating while wasting no time.

Students design proposals: The design proposals of the ‘Live Project Simulation’ were analyzed and categorized based on handling “the design brief” regarding the redesign of their studio to accommodate the ‘Vertical Studio Andragogical Strategy’.

Group Discussion: Conducted by the end of each experiment to discuss the students’ reflections considering their experience on the ‘Vertical Studio’ (Physical and Virtual).

4.4 Comparison of the Two Experiments ‘Vertical Studio’ (Physical Vs Virtual)

Timeline of Physical Vertical Studio (Fig. 2); Timeline of Virtual Vertical Studio (Fig. 3).

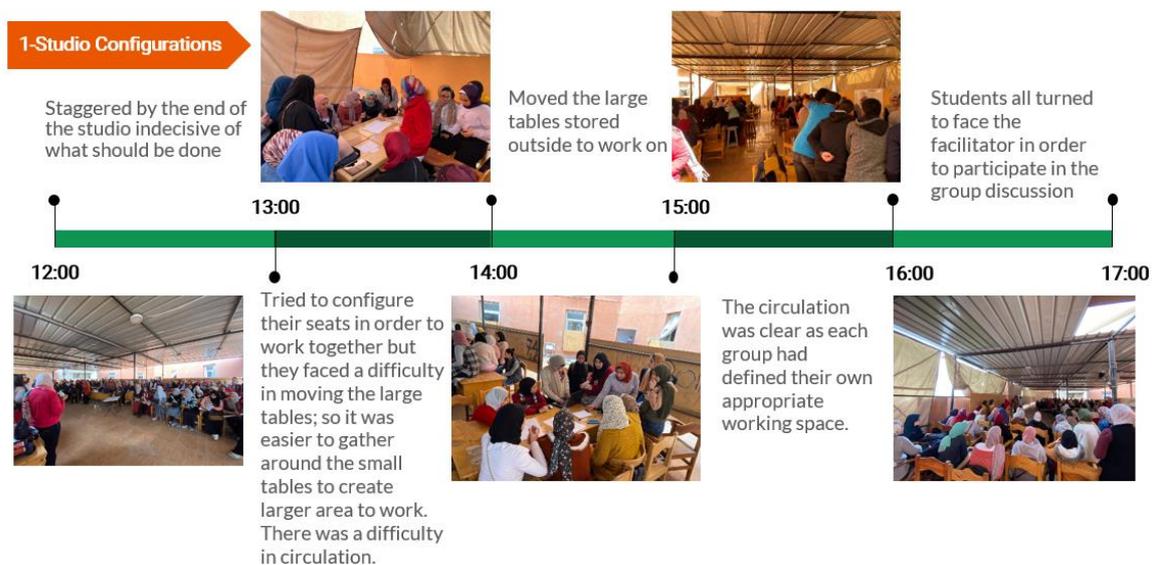


Figure (2) shows the timeline of the Physical Vertical Studio (source: the authors).

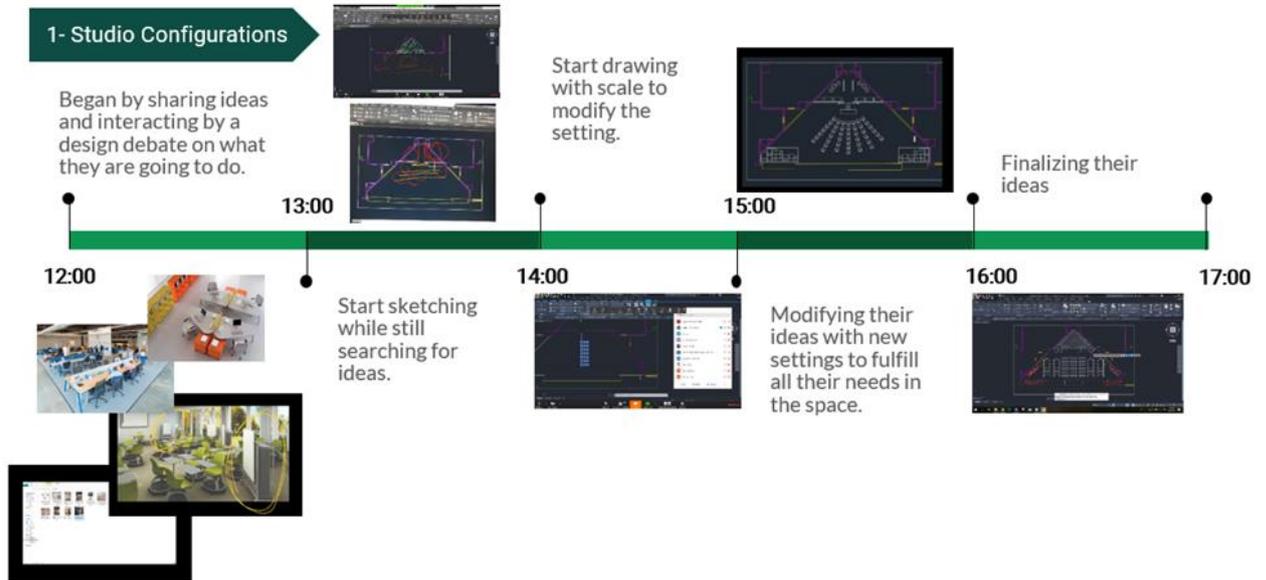
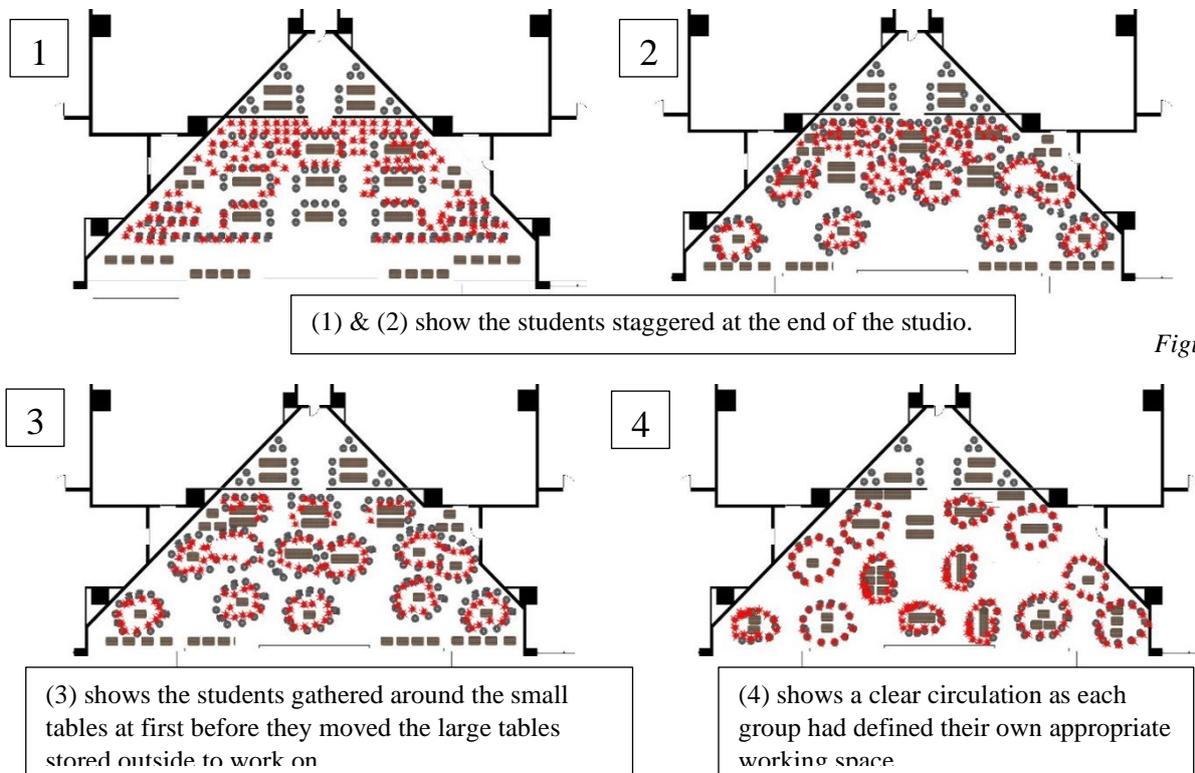


Figure (3) shows the timeline of the Virtual Vertical Studio (source: the authors)

The following behaviour mapping of the students' interactions in the physical experiment within the space show changing studio configurations throughout the experiment (Fig. 4).



Figure

Fig. (4) shows the behaviour mapping in the Physical Vertical Studio (source: the authors).

4.5 Students Design Proposals in the ‘Physical Vertical Studio’

The outcomes were divided into three main categories:

Formal (traditional) studio design (7: 12 groups) – as shown in the example of (Fig. 5); the designs resembled their current studio as a formal traditional studio while adding the feature of flexibility in moving the desks to create a collaborative setting. What is interesting is that some groups were precise in choosing the instructor's location in the "focal point" of their design which highlights the Tutor-Student relationship or the (Master-Apprentice Pedagogy) they are used to.

- Two out of seven showed more emphasis on individual studio configuration.
- One of seven showed emphasis on only collaborative studio configuration.
- Four out of seven were considering both individual and collaborative studio configuration equally.

Modular desks for flexibility (3: 12 groups) – as shown in the example of (Fig. 6). The three groups showed that smaller desks are more adjustable and flexible; this was inspired from their actual experience of setting up their working place to start their design of ‘Live Project Simulation’.

Multi-functional setting (2:12 groups) – as shown in the example of (Fig. 7). These two groups decided to give the mobility factor a lower impact as they accommodated several settings within the same place:

- One group applied the concept of multifunction setting integrated with the factor of flexibility. As their choices in furniture where light and movable.
- The other group created a fixed centered space for theoretical lectures to compensate their need for that space. This design decision sacrificed the area needed to the studio work; but interestingly they chose it to be a collaborative setting rather than an individual setting.

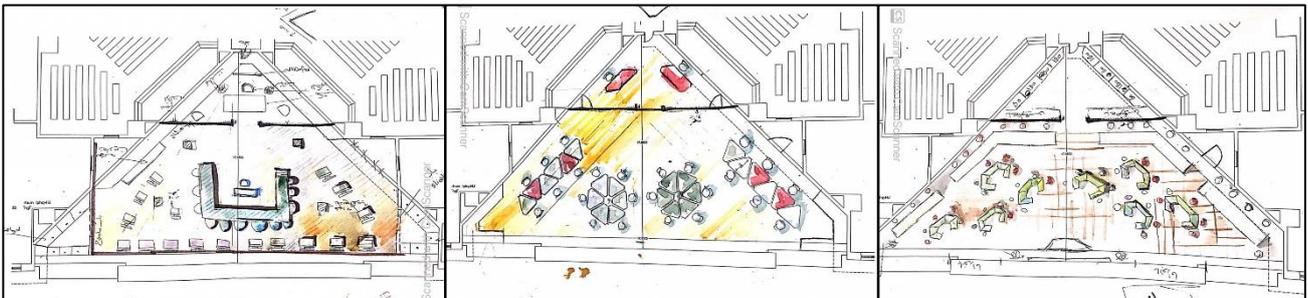


Fig. (5) shows formal (traditional) studio design resembling the current

Fig. (6) shows Modular desks for flexibility as smaller desks are more adjustable & flexible.

Fig. (7) shows Multi-functional setting which is applied through a light and movable furniture.

NB. The previous figures are photographs of original students’ manual drawings.

4.6 Students Design Proposals in the ‘Virtual Vertical Studio’

The outcomes were all categorized as a Multi-functional setting and applied flexibility and mobility in their design; Two out of Three groups were precise in choosing the instructor's location in the "focal point" of their design which highlights the Instructor-student relationship or the (Master – Apprentice Pedagogy) they are used to.

- **Group 1** added the feature of flexibility in moving the desks to create a collaborative setting, first option was an individual setting, while the second showed emphasis on collaborative setting (Fig. 8).
- **Group 2** was more creative in adding more space to the studio as they extended the studio vertically by a mezzanine floor with a set of modular drawing tables that can be gathered to achieve a collaborative setting (Fig. 9).
- **Group 3** tried to use the maximum space for different design features and functions to maximize space usage due to the alignment of different curricula activities. The student focus is on the front to the teacher / projector while working individually at the center of the plan and on the edges in contrary beside the lecture style studio which emphasizes the group work and collaboration (Fig. 10).

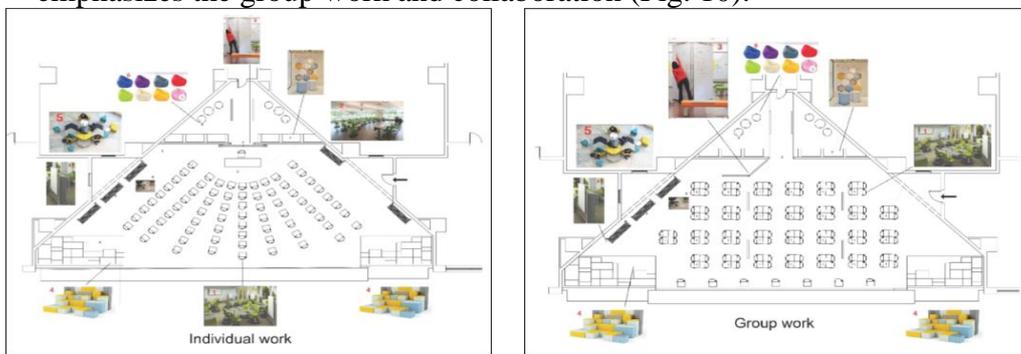


Fig. (8) Shows flexibility in moving the desks to create a collaborative setting.

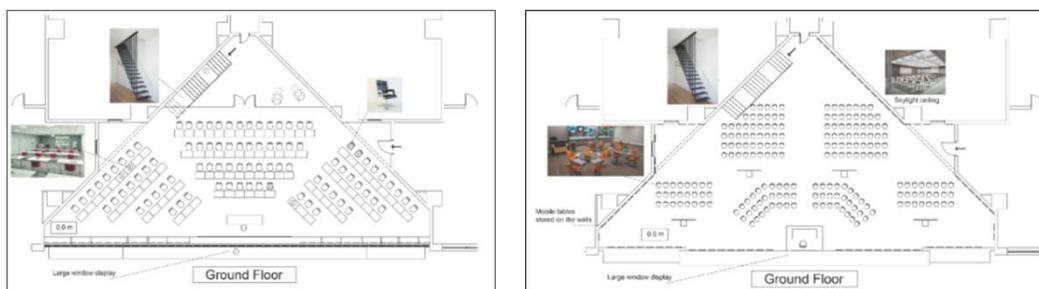


Fig. (9) Shows creativity in adding more space to the studio with a set of modular drawing tables that can be gathered to achieve a collaborative setting.

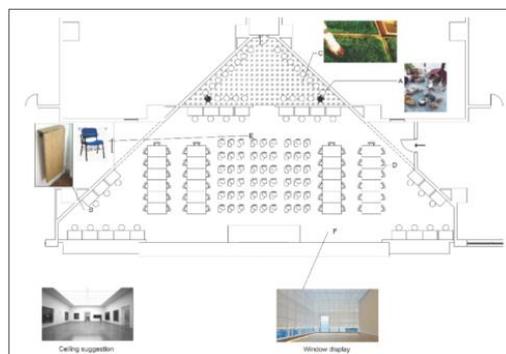


Fig. (10) Shows different design features and functions to maximize space usage due to the alignment of different curricula activities.

4.7 Group Discussion between Students and Facilitators

The third aspect to analyze these case studies was group discussion, the students reflected their experiences upon the experiments physical / virtual vertical studio.

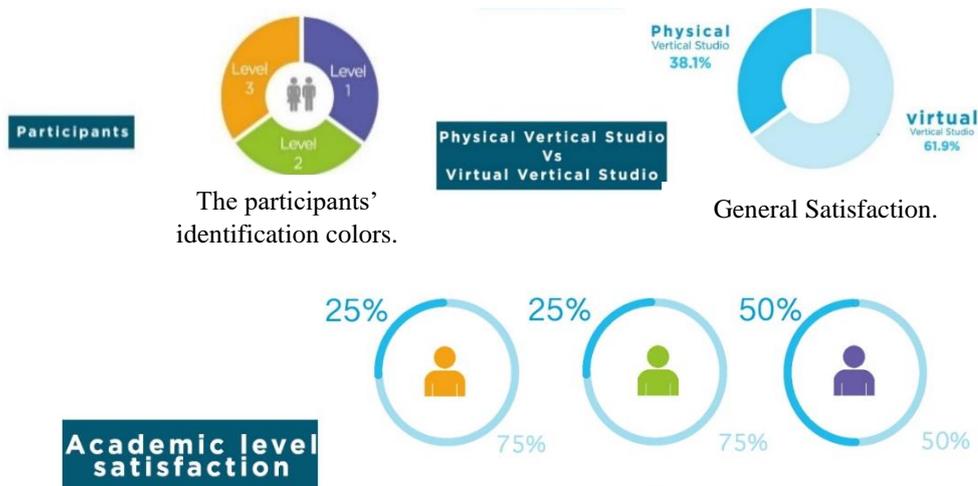
Table (5) A comparative students' reflections on their experiences (Physical Vs Virtual) 'Vertical Studios'

Physical group discussion	Virtual group discussion
All groups uncovered same space design problems; the idea that they are the users of the space and that it is a 'Live Project Simulation' made them all highlight what needed to be tackled.	As the students preferred to work on the same plan as in the physical, they knew the problems to be solved and started benefitting from the digital resources through selecting and displaying mood boards.
The 'Live Project Simulation' also assisted the students in pointing out the same space design opportunities, however their solutions were diverse.	Level 3 students showed more CAD knowledge whilst level 1 students showed more imagination and aspiration in their ideas.
The students were surprised that they benefited from the vertical (different academic levels) experiment and they recommended to apply it on monthly basis.	The virtual experiment consumed more time in brainstorming and searching for ideas and data at the expense of the given time for drawings.
The physical experiment resulted in several types of design settings proposals	The virtual experiment resulted in one type of design setting – the multifunctional.

5. STUDY FINDINGS – DISCUSSION – RECOMMENDATIONS

5.1 Study Findings

- Indicates that the younger Students from level one showed academic satisfaction equally in physical and virtual vertical studio.
- Students from level two and three academic satisfaction more in the virtual vertical studio.
- The younger students, more physical contact is needed while the older students, the more virtual communication is accepted (Fig. 11).



Students of level two and three showed more satisfaction in the virtual vertical studio
Younger students need more physical contact.

Fig. (11) Students' level of satisfaction based on the results of the questionnaire (source; the authors).

- The notion of having agreement level and satisfaction high in both experiments points out that students of interior design are open for collaboration whether it is physical or virtual they showed high level of engagement (Fig. 12).



Fig. (12) Shows the notion of having agreement level and satisfaction high in both experiments

5.2 Results' Discussion

In answer to the questions formulated above in the problem statement and adopted as the aims of this research, the author(s) discuss the following questions in relation to results:

- *What are the andragogic strategy that would better conform to the optimisation of interior architecture education?*

In this exploratory study, collaborative learning and live project simulation had a huge role in creating students' engagement, interactivity, and sense of involvement. The idea of having a real project of a place they have already experienced and are familiar with, helped them create new concepts of interior settings that could be adaptable to their way of clustering comfortably and be able to communicate and achieve efficiently. Thus, the (Co learning – Co Creation – open discussions) have been attained.

- *What are the types of compatible interior environment settings that would better fit an adopted andragogic strategy?*

Through the students' design proposals and the author(s)' analysis of the changeable settings within the studio, it was clear that the students had a preference to the multi-functional, mobile/flexible and modular units. However, interior architectural elements (walls/ windows, floor and ceiling) were also re-designed as follow: glass walls for natural light and visual accessibility to outdoor nature, gypsum board partition added to enclose a space; the building of a mezzanine floor; an extension area for storage/ break area/ staff area/ feedback zone and greenery planters; floor covering with HDF; part of the ceiling opened with a transparent material (polycarbonate) to allow more natural light.

- *What would be the impact of adopting an andragogic strategy on students' attitude and behaviour?*

During the workshops, it became noticeable to the (author(s)/ facilitators) that the vertical studio (mixed academic levels) increased the students' sense of confidence. The seniors acted as mentors to the juniors; whereas the juniors looked up to the seniors with aspiration and openness to learn. The communicative attitude was apparent in the interactivity that occurred throughout the experiment.

The research led the authors to think that the adaptability to virtual learning was different among different academic levels; early levels need physical contact whilst higher academic levels prefer to be mostly independent in their search and thinking. This leads to the prioritization of early academic levels in the physical premises with direct guidance and use the hybrid or blended learning which is a combination of physical and virtual for the higher academic levels. Besides, when the experiment is an extra-curricular it is attractive and engaging to the students who show more enthusiasm than when it within the regular class and this observation is common among the community of Interior Architecture Educators upon their reflection of students eagerness during the spring term of 2020 (the confinement). Therefore, the researchers encourage further investigations upon this observation.

4.3 Study Recommendations and Further Research

- Investigate recent andragogic strategies to optimize the whole educational process.
- Achieve physical supportive interiors that accommodate recent andragogic strategies to include the basic needs for collaborative learning.
- Apply the 'Vertical Studio' for project reviews periodically.

2. THE MODEL

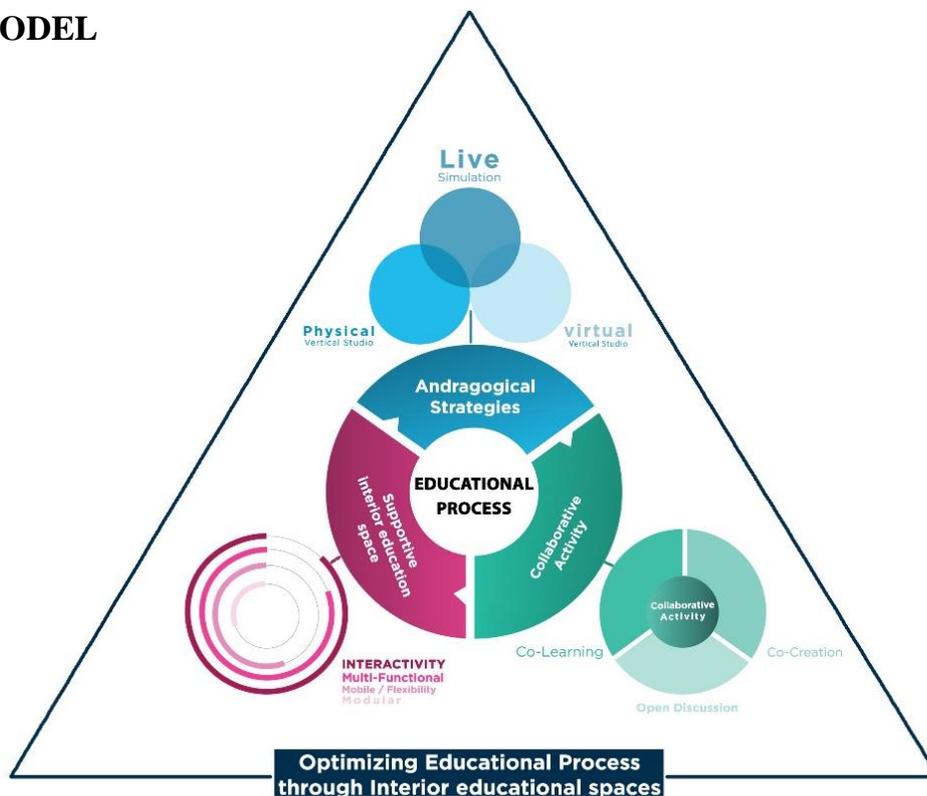


Fig. (13) shows the graphical model illustrates the idea that together, andragogic strategies, collaborative activities and supportive educational spaces optimize the educational process (source: the authors).

In the upper part “*Andragogic Strategies*” (Live, Physical and Virtual), shows that the live simulation project achieves a high level of engagement as the familiarity of the space and experience within the space helps in creating design assessment and visualization. In the ‘Vertical Studio’ both Physical and Virtual, the educational process is utilized to increase the benefits within a design project and at the same time they both need to be used interchangeably.

The right lower part “*Collaborative Activity*” is achieved using the recent andragogic strategies: Co-learning, Co-creation, and Open discussions, whilst the left lower part “*Supportive Interior Educational Space*”, supports Interactivity, Multi-functional Usage, Flexibility, and Changeability.

The model shows that andragogic strategies, supportive interior spaces and collaborative activity are all needed to optimize the whole educational process.

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