

## A THEMATIC REVIEW ON STUDENT-CENTRED LEARNING IN THE STUDIO EDUCATION

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### Abstract

Student's centred learning (SCL) has become a popular approach in today's higher learning education. It involves a collaborative synergy where teachers see the benefits to students, regarding increased enthusiasm, participation, and better preparation in the class project. Despite its popularity, there is no review paper discussing the type of SCL that has been implemented in the design studio teaching. This review was motivated by the belief that design studio in an immense pedagogy that needs to innovate the way it is taught in the classroom. Therefore, the goal of this systematic review is to synthesize literature from 2010 to 2019 on the SCL approach practices in the design studio using ATLAS.ti 8. A keyword search, followed by a filter using inclusion criteria from SCOPUS, Science Direct and Mendeley databases, identified 42 peer-reviewed journal articles. However, after the inclusion and exclusion process, only 23 articles were used as the final articles to be reviewed. A thematic review of these 23 articles identified 17 initial codes characterizing SCL in the design studio, grouped in 5 clusters: cooperative learning, inquiry-based learning, project-based learning, problem-based learning and technology-based learning. The results benefit the future study on SCL for architectural studio and can be a guideline for design studio educators in the 21<sup>st</sup>-century studio teaching.

**Keywords:** SCL, architecture education, studio teaching, ATLAS.ti 8, thematic review

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### INTRODUCTION

Student-centred learning (SCL) has become a popular approach in today's higher learning education. It involves a collaborative synergy where teachers see the benefits to students, regarding increased enthusiasm, participation, and better preparation in the class project (Zairul, 2018b). Furthermore, in SCL student's take charge in their own learning and thus increased their autonomy (Wang & Zhang, 2019). In addition, E. Lee & Hannafin, (2016) supports that student-centred learning (SCL) is a learning approach during which students generate learning opportunities and reconstruct knowledge dynamically in an open-ended learning environment. Often, students identify individual learning goals to pursue external goals. In the design studio, students build on unique background knowledge and experiences and further explore, select, and use tools and resources (Powers, 2016). Although studio education applies constructive experience, pedagogy related SCL in design education is still scarce.

This paper argues that SCL is a complex learning process that students must be thoroughly supported in the motivational, cognitive, and social aspects. There is a misconception about SCL is students steering their studies without guidance (Hannafin et al. 2014). Instead, students will be facilitated in terms of organizing the study, peer-reviewed and involve in the assessment progress. Supported by Elen, Clarebout, Léonard, & Lowyck, (2007) student's centred learning creates a powerful learning environment among student's in the classroom. Further, S.O.L.E module emphasis on leadership, communication, life-long learning, participation and teamwork (Zairul, 2018b). Two decades ago, Grabinger and Dunlap

(1995) promoted the Rich Environments for Active Learning (REAL) model in which students involves in debates and higher-level order of thinking and became critical of their own work. Later, Casey (2013) presented a SCL framework that focused on the social aspect of SCL capitalizing active learning and peer support via social media. Earlier, Keller's ARCS model (Keller 1987) provided a motivational design approach to instruction to systemically enhance attention, relevance, confidence, and satisfaction. Previous design frameworks for learning and instruction have not adequately embodied the intersections of the key motivational, cognitive, social, and affective constructs afforded by emerging technologies. Particularly, existing frameworks typically failed to scaffold student autonomy and rarely reflected in the studio education.

Despite SCL popularity, there is no review paper discussing the type of SCL that has been implemented in the design studio teaching. Therefore, this review was motivated by the belief that design studio in an immense pedagogy that needs to innovate the way it is taught in the studio. The design studio atmosphere has continued the same during the past century although active participation and personalized learning environments have always been emphasized in studio teaching (Powers, 2016). Further, the methodology of SCL in studio teaching tends to be overlooked. Hence, this paper aims to do a systematic review on the literature from 2010 to 2019 on the SCL approach practices in the design studio and to discuss methods used in the current studio around the world based on the following question: -

**RQ: What are the current practices on SCL in the design studio discussed in the publications from 2010- 2019?**

METHODOLOGY

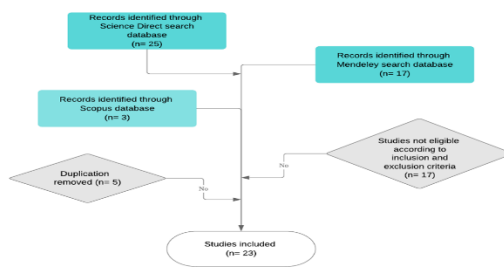


Figure 1: Inclusion and exclusion criteria

In the first step, a systematic review of research articles is carried out to identify the current state of academic insight with regards to the SCL in the design studio. If accessible, published articles were extracted from the Science Direct using the keyword “Student-centred learning” AND design studio as well as Scopus using the keyword TITLE-ABS-KEY (“Student centred learning” AND “design studio”) AND PUBYEAR- 2010 to 2019, TITLE-ABS-KEY (“Student centred learning” AND “studio”) AND PUBYEAR - 2010 -2019. Mendeley database was also used to extract Elsevier publications using keyword “Student centred learning” AND design studio year: [2010 TO 2019] This resulted in about 45 publications considering the results from three

databases. As this review is limited to peer-reviewed journals and thesis and after some duplications found 22 publications were removed. As a next step, articles have been considered for review that was published during the last five years (2010 until 2019 inclusively). After removing duplicates and scanning of all abstracts to remove articles irrelevant to the topic of this research a total of 23 papers resulted as a basis for review. Articles have been regarded as irrelevant if the association with SCL in the design studio, i.e. an Architecture perceived as IoT, has been removed. Due to the major share of articles focusing on SCL in the design studio (see Fig. 1).

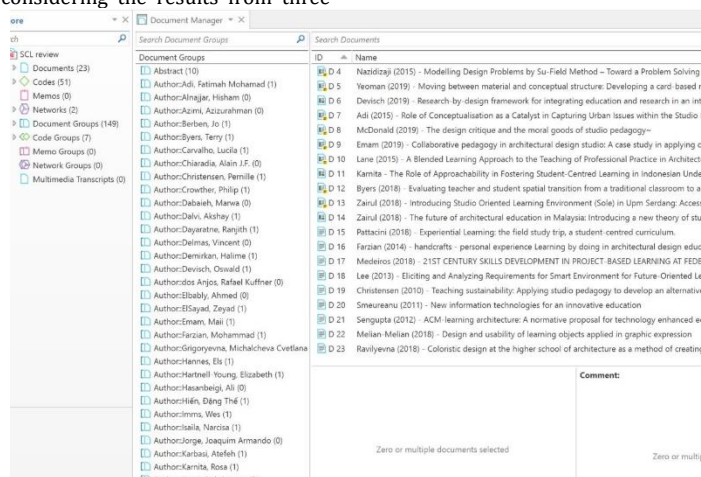


Figure 2: The code group established from Mendeley metadata

Next, all 23 metadata were transferred to ATLAS.ti 8 and created as primary documents. From the metadata established in Mendeley, several groupings were initiated automatically in the code group as (figure 2). The classification in ATLAS.ti 8 has made the sorting much easier and systematic. In the first round of coding, 17 initial codes were produced. Later the codes were group into several themes and to answer the research question on “what are the current practices on SCL in the design studio discussed in the publications from 2010- 2019?” contributed to a final of five main categories to answer the research questions. The findings of this review will be divided into two parts; Quantitative findings and Qualitative findings.

RESULTS AND DISCUSSION

Quantitative findings

As database queries were static and the use of the phrase “SCL” OR “Student-centred learning” OR ‘Learners centred learning’ were scarce in the architectural based education, proceedings

and thesis were also included to evaluate the trends and patterns. Though the paper meant for architecture or design-related pedagogy, the journals recorded that the articles were published varies. These research strings are either directly referenced in the identified 23 articles through several periodicals namely; Alexandria Engineering Journal, CEBE transactions, Compass; Design studies, etc. (table 1). The development of an SCL in the design studio is subsequently carried out by a critical review of the findings from the review in the light of the major associated pedagogies exercises in the studio teaching. From table 1 below, the trend of publishing is seen increasing from year to year. In 2010, there are not many publications highlighted the idea of SCL in their publications, however, the numbers increasing year by year and at the time of this article was written, 2019 recorded only 3 may be due to some articles are still in progress. This article noticed, most journals involved are not necessary architecture-related such as Education Sciences and Journal of Sustainable Real Estate.

**Table 1: Articles reviewed based on journals**

	2010	2011	2012	2013	2014	2015	2016	2018	2019
<i>Alexandria Engineering Journal</i>								1	
<i>CEBE Transactions</i>			1						
<i>Compass: Journal of Learning and Teaching</i>								1	
<i>Computer Applications in Engineering Education</i>								1	
<i>Design Studies</i>							1		2
<i>Education Sciences</i>						1			
<i>Frontiers of Architectural Research</i>									1
<i>Honar-Ha-Ye-Ziba: Memary Va ShahrSazi</i>					1				
<i>INTED2018 Proceedings</i>								1	
<i>International Journal of Architectural Research: ArchNet-IJAR</i>								1	
<i>Journal of Sustainable Real Estate</i>	1								
<i>PAM International Education Conference 2018</i>								1	
<i>Perspektivy Nauki i Obrazovania</i>								1	
<i>Procedia - Social and Behavioral Sciences</i>				1		2			
<i>Proceedings - 2012 IEEE International Conference on Technology Enhanced Education, ICTEE 2012</i>			1						
<i>Studies in Educational Evaluation</i>								1	
<i>The Knowledge Management Society of Korea</i>				1					
<i>World Journal on Educational Technology</i>		1							

**Table 1: Publications found according to journal and year**

The 23 research articles have been reviewed in an iterative process in which comparisons for similarities and differences have been made in order to achieve consistency in the resulting sub-categories. A list of publications and their allocation into the subcategories can be found in table 2. Furthermore, the different perspectives from which SCL has been researched so far have been identified. The research articles have been

allocated to the perspective of the methodology used to present SCL in the design pedagogy. The initial coding of 15 codes was further categorized into 5 main theme which is cooperative learning; inquiry-based learning; problem-based learning, project-based learning, and technology-based learning (table 2).

**Table 2: Documents to a theme table**

	Cooperative learning	Inquiry-based	Project-based	Technology-based
(Dayaratne, 2013)			/	
(Murray, 2012)		/		
(Demirkan, 2016)				/
(Nazidizaji, Tomé, & Regateiro, 2015)			/	
(Yeoman & Carvalho, 2019)			/	
(Devisch et al., 2019)	/			
(Adi, Khaidzir, & Said, 2015)		/		
(McDonald & Michela, 2019)		/		
(Emam, Taha, & ElSayad, 2019)		/		

(Lane, Osborne, & Crowther, 2015)				/
(Karnita, 2018)		/		
(Byers, Imms, & Hartnell-Young, 2018)				/
(Zairul, 2018a)	/			
(Zairul, 2018c)				/
(Pattacini, 2018)			/	
(Farzian & Karbasi, 2014)				/
(Medeiros, Santos, Rodrigues Júnior, & Paz, 2018)			/	
(J. Lee, Lee, & Kim, 2013a)				/
(Hwang & Christensen, 2008)	/			
(Smeureanu & Isaila, 2011)				/
(Sengupta, Thamilarasu, Dalvi, & Vellanki, 2012)				/
(Melian-Melian & Martin-Gutierrez, 2018)				/
(Ravilyevna & Grigoryevna, 2018)				/

The pattern was analysed using the year and country of the study conducted. The paper found the trends on cooperative learning was established or practised in 2010 (which mainly using traditional way) and still relevant until today however through cooperative mobile-learning strategies. The pattern on inquiry-based was discussed in 2012, 2015 and still relevant as part of the main elements for SCL to demystifies teaching and learning in the studio. While problem-based are still a common approach in the studio where it relates to the design issues and how it can be solved through design solution. In the project-

based, although only one project reports on it, it remains as the core and fundamental understanding on the studio pertaining to positioning problem-solving within a studio environment simply because it strongly resembles the processes used by professional architects outside. Further, technology-based education has become much popular nowadays and has given an impact towards the way we taught in the classroom and partly because of the technology-related apps that have become much affordable nowadays (Christensen, Aaron, & Clark, 2001)

**Table 3: The theme according to year**

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
<b>Cooperative learning</b>	1	-	-	-	-	-	-	-	1	1
<b>Inquiry-based</b>	-	-	1	-	-	1	-	-	-	2
<b>Problem-based</b>	-	-	-	1	-	1	-	-	2	1
<b>Project-based</b>	-	-	-	-	-	-	-	-	1	1
<b>Technology-based</b>	-	1	1	1	1	1	1	-	4	-

The trends of SCL in-studio education was seen rather popular towards emerging countries such as Malaysia and Australia. There are also SCL publications reported from other countries such as Bahrain, Belgium, Brazil, Caribbean, Egypt, Indonesia, Iran, New Zealand, Portugal, Russia, South Korea, Turkey, USA and the UK. This shows the SCL has been increasing trends

toward the implementation of SCL in the studio, but it should not stop there. In fact, the SCL shall be an impetus of pedagogical change in studio education and challenge the way pedagogy was taught for the past century.

**Table 4: The distribution of articles according to country**

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
<b>Australia</b>			1			1			1		3
<b>Bahrain</b>				1							1
<b>Belgium</b>										1	1
<b>Brazil</b>									1		1
<b>Caribbean</b>	1										1
<b>Egypt</b>										1	1
<b>Indonesia</b>									1		1
<b>Iran</b>					1						1
<b>Malaysia</b>						1			2		3
<b>New Zealand</b>										1	1
<b>Portugal</b>						1					1
<b>Russia</b>									1		1
<b>South Korea</b>				1							1
<b>Turkey</b>								1			1
<b>United Kingdom</b>									1		1
<b>USA</b>										1	1

Vietnam									1	1
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Qualitative findings

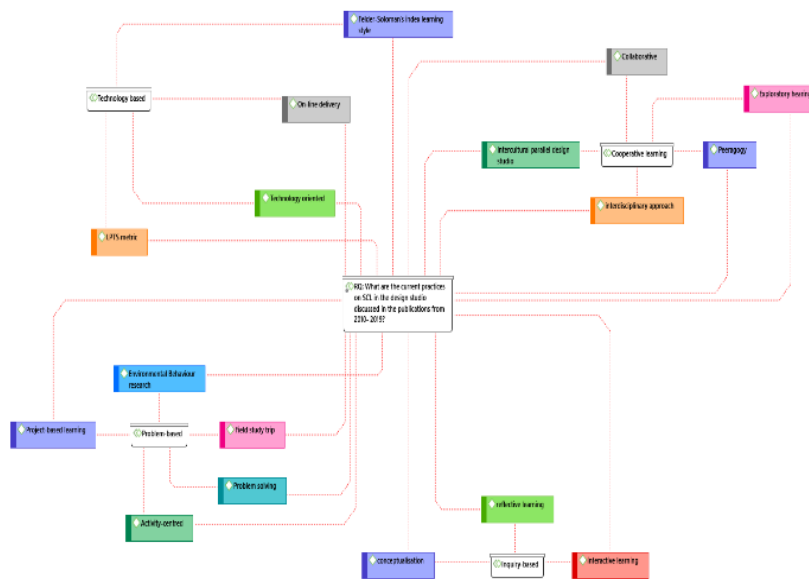
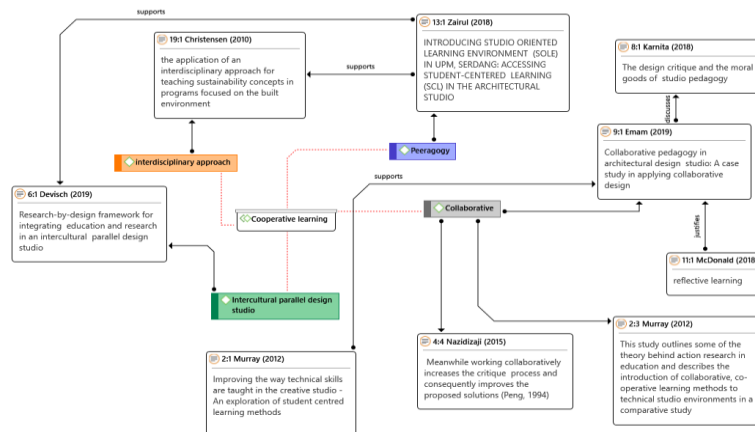


Figure 3: A network view on how to answer research questions through thematic review

Cooperative learning

Cooperative and collaborative learning are defined as conducted by a control group and can be carried out online or offline (Barkley, Major, & Cross, 2014; Shukor, Tasir, Van der Meijden, & Harun, 2014). According to Devisch et al., (2019), cooperative learning can be achieved only through good supervision and aptitude of the tutors to handle the situation in the studio. To support this, peeragogy can be one of the options to allow collaborative strategy among the peers in the studio through review and assessment (Zairul, 2018a). The value on knowledge retaining could be amplified in the design studio, as being proposed by Lane et al., (2015) through art and design

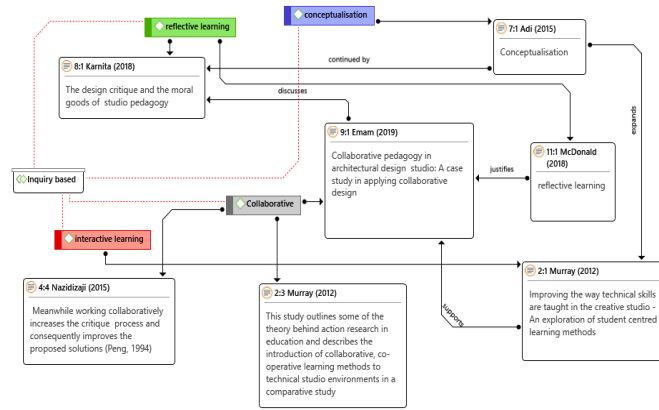
subject. The collaborative learning strategy is the best way to improve graduate’s interpersonal skills (Murray, 2012). Previous studies mentioned, collaboration in the studio improve the solutions and increase the knowledge among members critically (Peng, 1994). Recently, Yeoman & Carvalho, (2019), reported collaboration in the studio can be implemented through real problems based on his case study in the SEED project. Nevertheless, supervision competency is rarely discussed in studio-based education, therefore, provide a gap to establish how cooperative learning increase competency among tutors especially in an online environment.



Inquiry-based

Inquiry-based learning has been one of the foundations for the student-centred learning approach in teaching and learning. Contrary to a traditional way of learning, inquiry-based learning allows the students to explore the topic before the class begin and it starts with posing questions prior to the normal lecture. In a studio environment, inquiry-based learning helps the students generate understanding of reflective knowledge. According to Adi et al., (2015), the conceptualisation process helps the reflection of the knowledge and this is especially important as a designer. The process of

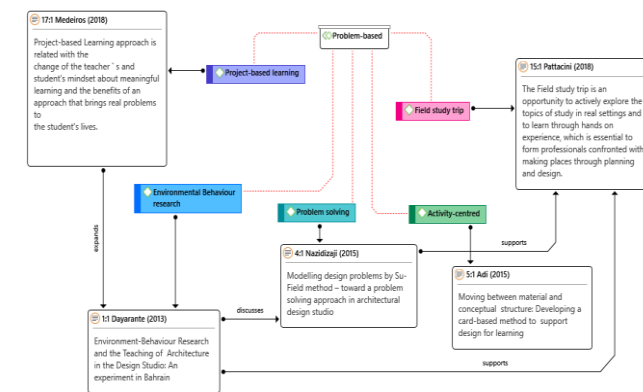
inquiry also supports collaborative and improve the student’s communication skills which will help the graduates in the future (Murray, 2012). The role of SCL helps to create a communal, insightful, independent and cooperative environment in the studio teaching (Karnita, 2018). Inquiry-based also helps to reflect student achievement in the studio through the framework as being discussed by Adi et al., (2015). However, the inquiry-based approach in the current studio is a lack in term of structure and how it is implemented in studio teaching moreover in the online teaching and learning.



**Problem-based**

Problem-based learning is one of the popular approaches in solving practical issues and solving it by recommending a suitable solution. Under this strategy, several authors talk about activity centred (Adi et al., 2015), environmental behaviour research (Dayaratne, 2013), field study trip (Pattacini, 2018), problem-solving (Nazidizaji, Tome, & Regateiro, 2015) and project-based learning (Medeiros et al., 2018). Real problems from the practice and industry can give good exercise for the students to propose potential solutions. The idea of connecting

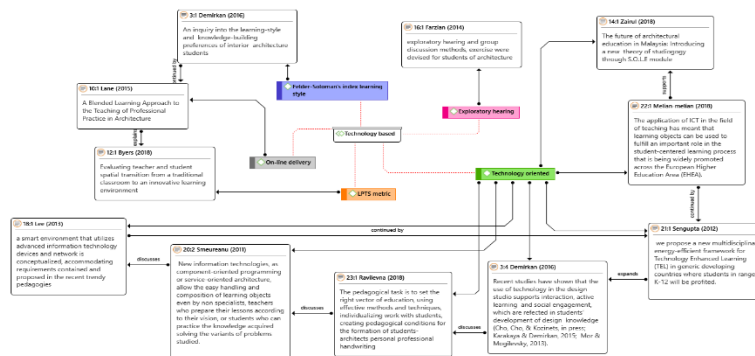
theory and practice, bringing theory into practice has been proposed by Yeoman & Carvalho, 2019). Nevertheless, the lack of peer’s discussion strategy in a real-time has suspended the potential of solving the studio problems in a given time. A normal studio project can last up to 14 weeks thus gives an impression of the problems might not represent a fast reliable solution in the real world. Several strategies may include real-time video conferencing with practicing architects during the critique session.



**Technology-based**

Recently, technology-based learning has become popular thanks to technology advancement. The terms cybergogy emphasis on how students utilize technology for their own education and learning. Several approaches suggesting ICT as the tools for education as highlighted by (Zairul, 2018c) through apps like Padlet and Kahoot. Technology-based learning recognized innovative teaching and learning through an online medium in the cyberspace. The technology also supports student’s participation and social participation in the studio environment (Demirkan, 2016). Recent pedagogies

accommodates technology apps to support their teaching and has become trendy in a smart environment (J. Lee, Lee, & Kim, 2013b). Further, the advent of social media such as Facebook and Twitter and several educational based apps has changed the way we communicate (Lane et al., 2015). The effort on using technology in education has been promoted worldwide and across the Higher Education (Melian-Melian & Martin-Gutierrez, 2018). Nevertheless, how the technology implemented in the studio teaching is still lacking in the current literature.



## CONCLUSION

This review paper highlights the most common approaches in the current SCL method in the studio teaching through cooperative, inquiry-based, problem-based and technology-based learning in the studio teaching. There are several issues raised despite the implementation of the SCL approaches in the design studio. Some of the elements include the supervision competency which is rarely discussed in the studio-based education, therefore, provide a gap to establish how cooperative learning increase competency among tutors in an online environment can be implemented. Further, the inquiry-based approach in the current studio is lacking in term of structure and very few articles mentioned how the approach is implemented and practised in the studio. In addition, the lack of peer's discussion strategy in a real-time has suspended the potential of solving the studio problems within a stipulated time and cause additional workloads for a personal consultation for the studio tutors' sessions with the students. In summarize, future studies should investigate how the technology executed in the studio teaching and to produce a collaborative environment through support from technology that can help to solve real problems through inquiry learning.

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