

الجامعة  
البريطانية في  
دبي



The  
British University  
in Dubai

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## The Second BUiD Doctoral Research Conference



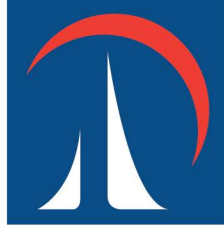
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**The 2<sup>nd</sup> BUiD Doctoral Research Conference**

**BDRC 2016**

**The British University in Dubai, 14th May 2016**

**Conference Proceedings**

**Extended Abstracts and Conference Papers**

## Introduction

The Annual BUiD Doctoral Research Conference took place for the second year on the 14<sup>th</sup> of May 2016. The conference included submissions from both Doctoral and Masters students from the British University in Dubai and UAE based universities, including Manipal University and Heriot-Watt University. In addition, there were a large number of submissions from several UK based universities including universities from the UK Alliance. Students from Cardiff University, the University of Glasgow and Liverpool John Moores University participated and presented at the conference, as well as students from the University of Rome and Skolkovo (Moscow School of Management).

Over 100 students attended the conference, with 74 participating students from local and international universities. Keynote speaker, Professor Ghassan Aouad, President of Applied Science University in Bahrain, presented on the “Art and Science of doing a PhD.” Dr. Maureen Farrell from the University of Glasgow, one of BUiD’s UK associate universities, gave a second keynote speech in the morning on the topic of “Journeys with Children’s Literature: Research with impact.”

The conference included a range of themes from several disciplines to ensure that all students who are studying a wide range of doctoral research topics can participate in the conference. The themes adopted in this year’s conference included: Innovation, Sustainability, Business, Project Management, IT, Engineering, Law and Education.

Students from both BUiD and UK Associate universities reviewed papers to gain experience and practice for their future academic activities. Academics from the University of Glasgow and the University of Manchester were also present on the day to support the conference.

Six best paper awards were given to the best submissions, which included 2 from Education, 1 from Business & Law and 3 from Engineering & IT. This year, all participating students were given the option to decide whether or not to be included in the BDRC 2016 published conference proceedings.

## **BDRC 2016 Editors**

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Christine Unterhitzberger	PhD, Liverpool John Moores University

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## The 2nd BUiD Annual Doctoral Research Conference 2016

<b>8:30 – 9:00</b>	<b>Registration</b>								
<b>9:00-9:15</b>	<b>Welcome and Introduction</b>								
<b>9:15 - 10:15</b>	<b>Keynote Presentation: “The Art and Science of Doing a PhD.”</b> <i>Prof. Ghassan Aouad, President of Applied Science University (ASU), Bahrain.</i>								
<b>10:15 - 11:00</b>	<b>Keynote Presentation 2: “Journeys with Children’s Literature: Research with impact.”</b> <i>Dr. Maureen Farrell, University of Glasgow, UK.</i>								
Session	Time	Auditorium Engineering & IT <small>Chair: Prof. Halim Boussebaine</small>		CR1 Full Research Proposal Closed Session <small>Chair: Prof. Ashly Pinnington</small>		CR 2 Education <small>Chair: Dr. Solomon David</small>		CR3 Engineering & IT <small>Chair: Prof. Bassam Abu-Hijleh</small>	
		Presenter	Discussant	Presenter	Discussant	Presenter	Discussant	Presenter	Discussant
<b>1</b> <b>11:15 - 13:15</b>	11:15 – 11:35	Ibrahim Nasser (BUID)	Eyad Megdadi (BUID)	Shireen Chaya (BUID)		Roeia Thabet (BUID)	Doaa Mostafa (BUID)	Hamdy Elsayed (BUID)	Shaikha Abdool (BUID)
	11:35 – 11:55	Eyad Megdadi (BUID)	Ibrahim Nasser (BUID)	Samih Yehia (BUID)		Doaa Mostafa (BUID)	Roeia Thabet (BUID)	Alya Harbi (BUID)	Shaikha Abdool (BUID)
	11:55 – 12:15	Noha Amer (BUID)	Jimoh Kareem (SKEMA)	Mohamed AlDhanhan i (BUID)		Senthilnath an Ramakrish nan (BUID)	Ashok Iyer (Cardiff University)	Alya Harbi/ Shaikha Abdool (BUID)	Hanadi AlSuwaidi (BUID)
	12:15 – 12:35	Jimoh Kareem (SKEMA)	Noha Amer (BUID)	Fatma AlHashimi (BUID)		Heba Daraghmeh (BUID)	Lara Abdallah (BUID)	Hanadi AlSuwaidi (BUID)	Hamdy Elsayed (BUID)
	12:35 – 12:55	Muna Ali (BUID)	Maitha AlHameli (BUID)	Nawfal Ghani (BUID)		Khawla Al-Shehi (BUID)	Rania Amaireh (BUID)	Alia Marjan (BUID)	Evgeny Plaksenkov (SKOLKOVO)
	12:55 – 13:15	Maitha AlHameli (BUID)	Muna Ali (BUID)	Ebtihal Al-Tamimi (BUID)		Lara Abdallah (BUID)	Heba Daraghmeh (BUID)	Evgeny Plaksenkov (SKOLKOVO)	Alia Marjan (BUID)

**13:15 – 14:15 Lunch & Prayers**



Session	Time	Auditorium Engineering & IT Chair: Prof. Julian Dow		CR 1 Business & Law Chair: Dr. Abba Kolo		CR 2 Education Chair: Dr. Lang Wanphet		C3 E-Sessions Chair: Student Organizing Committee	
		Presenter	Discussant	Presenter	Discussant	Presenter	Discussant	Presenter	Discussant
2 14:15 – 16:35	14:15 – 14:35	Alya Harbi (BUiD)	Shaikha Abdool (BUiD)	Rajesh Pai (Manipal University)	Nada Rabie (BUiD)	Mohammed Assaf (BUiD)	Hannah Wilson (Liverpool John Moores University)	Khalid Hashim (Liverpool John Moores University)	Ameer Jebur (Liverpool John Moores University)
	14:35 – 14:55	Shaikha Abdool (BUiD)	Alya Harbi (BUiD)	Gabriele Capogna (University of Rome)	Ruslan Ibraev (SKOLKOVO)	Yan Zengh (University of Glasgow)	Susanne Abou Ghaida (University of Glasgow)	Hayder Shanbara (Liverpool John Moores University)	Anmar Dulaimi (Liverpool John Moores University)
	14:55 – 15:15	Shaikha Abdool (BUiD)	Alya Harbi (BUiD)	Christine Unterhitzenberger (Liverpool John Moores University)	Nadia Mohammed (BUiD MBA)	Susanne Abou Ghaida (University of Glasgow)	Yan Zengh (University of Glasgow)	Hassnen Jafer (Liverpool John Moores University)	Ali Al-Attabi (Liverpool John Moores University)
	15:15 – 15:35	Ala'a Abuhejleh (BUiD)	Bertug Ozarisoy (Cardiff University)	Nada Rabie (BUiD)	Rajesh Pai (Manipal University)	Nesrin Tantawy (BUiD)	Fatema Huzefa (BUiD)	Ameer Jebur (Liverpool John Moores University)	Khalid Hashim (Liverpool John Moores University)
	15:35 – 15:55	Issam Ezzeddine (Heriot-Watt University)	Marwan Abu Ebeid (Heriot-Watt University)	Ruslan Ibraev (SKOLKOVO)	Gabriele Capogna (University of Rome)	Fatema Huzefa (BUiD)	Nesrin Tantawy (BUiD)	Anmar Dulaimi (Liverpool John Moores University)	Hayder Shanbara (Liverpool John Moores University)
	15:55- 16:15	Shireen Chaya (BUiD)	Sundus Sherief (BUiD)	Nadia Mohammed (BUiD MBA)	Christine Unterhitzenberger (Liverpool John Moores University)	Hannah Wilson (Liverpool John Moores University)	Mohammed Assaf (BUiD)	Ali Al-Attabi (Liverpool John Moores University)	Hassnen Jafer (Liverpool John Moores University)
	16:15 – 16:35	Bertug Ozarisoy (Cardiff University)	Sundus Sherief (BUiD)					Ali Al-Zeyadi (Liverpool John Moores University)	Christine Unterhitzenberger (Liverpool John Moores University)
	Session	Time	Auditorium Education Chair: Dr. Lang Wanphet		CR 1 Full Research Proposal Closed Session Chair: Prof. Paul Gardiner		CR 2 Full Research Proposal Closed Session Chair: Prof. Julian Dow		CR3 Engineering & IT Chair: Prof. Halim Boussebaine
3 16:35 – 18:15	16:35– 16:55	Rania Amaireh (BUiD)	Khawla Al-Shehi (BUiD)	Aysha Al Janahi (BUiD)		Bhavana Nair (BUiD)		Ashok Iyer (Cardiff University)	Sundus Sherief (BUiD)
	16:55 – 17:15	Auditorium Engineering & IT Chair: Dr. Lang Wanphet		Sulaiman Shebli (BUiD)		Lolowa AlMarzoqi (BUiD)		Nawal Rashed Al Hassani (BUiD)	Christine Unterhitzenberger

									(Liverpool John Moores University)
	17:15 – 17:35	<b>Fuad Al Attar (BUID)</b>	<b>Ibrahim Nasser (BUID)</b>	<b>Yacoub Petro (BUID)</b>		<b>Fatima Abazar (BUID)</b>		<b>Marwan Abu Ebeid (Heriot-Watt University)</b>	<b>Issam Ezzeddine (Heriot-Watt University)</b>
	17:35 – 17:55	<b>Fuad Al Attar (BUID)</b>	<b>David Kantro (BUID)</b>	<b>Sundus Sherief (BUID)</b>		<b>Nooreya Alobeidli (BUID)</b>		<b>Hoor Riadh (BUID)</b>	<b>Aseel Hussein (BUID)</b>
	17:55 – 18:15	<b>David Kantro (BUID)</b>	<b>Fuad Al Attar (BUID)</b>	<b>Jumah Al Mazrouei (BUID)</b>		<b>Reena Rajivan (BUID)</b>		<b>Huda Al Suwaidi (BUID)</b>	<b>Christine Unterhitzenberger (Liverpool John Moores University)</b>
<b>18:15</b>		<b>Awards Ceremony &amp; Farewells</b>							

## **Approaches to Learning Adopted by Students of Architecture – A Classification**

*Ashok Ganapathy Iyer, PhD Student,  
Welsh School of Architecture, Cardiff University, UK*

### Abstract

The paper explores the ongoing PhD research work being done to classify the students' approaches to learning in architectural education through an international perspective. The research hypothesis, the qualitative methodology used for the research; phenomenographic research and approaches to learning are reviewed in detail. The results of the pilot study conducted to understand the phenomenographic approach is discussed with reference to earlier studies in higher and university education. The paper attempts to present 'the way forward,' by initiating a discussion within the research community on the research journey adopted in the search of this classification.

### Introduction

The research has looked into the nature of students' approaches to learning in the architecture program through their experiences in the core coursework of architectural design, presented within the larger research context of architectural education. What are the approaches to learning being adopted by the students of architecture in the coursework of architectural design, has led to another exploratory question; how theory introduced in the first year architectural design coursework impacts on their learning approaches in the subsequent years? The above research hypothesis has been further reinforced by the research question; why do approaches to learning evolve in the architectural design coursework from the first to the final year? The basis to look at learning approaches in architectural education is due to the significant research gap in this field in comparison to the relative clarity within research in other disciplines. The aim is to classify the learning approaches adopted by students of architecture in their design coursework, with the vehicle for this classification being explored through theory introduced in early-stage curriculum and its impact on the learning approaches in the subsequent years. The main objective of the research is to identify the approaches to learning adopted by students of architecture in their design project work by looking at theory introduced in the students' first year core coursework of architectural design and using that as a vehicle to evaluate their learning approaches in subsequent years. The research has endeavored to classify these learning approaches to understand how they actually manifest themselves in architectural education. The identified research methodology; phenomenography has been used to categorize the students' approaches to learning in the early-stage curriculum and subsequent years of their architectural program. The research outcome will be presented as categories of approaches to learning presented through an outcome space.

## **Approaches to Learning Adopted by Students of Architecture – A Classification**

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### Abstract

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## Literature Review

Approaches to learning with reference to students in higher education have been expressed in terms of surface and deep approaches (Marton and Säljö 1976). The surface to deep approaches to learning within the research in higher education has been variedly studied in multitude of disciplines. Students' approaches to learning are directly correlative to their prior experiences of studying and understanding the key concepts of the subject matter, which is vital to the subsequent approaches to studying and learning outcomes (Prosser and Trigwell 1999). Thus research into the approaches to learning has been an endeavor towards reflecting on the student's experience within the domain of higher and university education.

### **Teaching and Learning in Higher Education – 3-P & Phenomenographic Model**

Research into the teaching and learning in higher education has evolved in the past century with a series of theories being put forward by various schools of thought following quantitative, qualitative and mixed methodologies. This journey includes the schism that has developed within the research of higher education at the university where the researcher and teacher are required to holistically look at learning and teaching as a living eco-system (Schon 1987) with the introduction of various theories of learning from the implicit-theories-in-use to the explicit theories or formal theories of student learning; which includes the classroom-based theories of learning, the institutional model, and the phenomenographic model (Biggs 1994). A distinctive differentiation of the classroom-based theories of learning and the institutional model where the student's characteristics with reference to the teaching context and the approaches to learning, thus taken in achieving the learning outcome is seen through the 3-P Model or the Presage – Process – Product classroom teaching model and the phenomenographic model where the learning is seen through the perspective of the learner i.e. the student (Biggs 1994). The emphasis is to the use of the phenomenographic approach in the understanding of learning and teaching through the students' prior experiences and their prior understanding as the key towards looking at the learning approaches, they take in their education and learning outcomes (Prosser and Trigwell 1999).

### **3-P Model and the Phenomenographic Approach**

The 3-P or the Presage – Process – Product classroom teaching model is based on the model that was derived from Dunkin and Biddle (1974) and the present version by Biggs (1987-93) was visualized as a dynamic system within an educational event with a mutual interaction between the students' approaches to learning forming an important part within factors such as prior knowledge, their ability and preferred approaches to learning; the teaching context which includes factors such as objectives of teaching and assessment coupled with institutional procedures and environment; on-task approaches to learning or learning - focused activities, and learning outcomes from a quantitative and qualitative basis (Biggs, Kember, and Leung 2001). The Study Process Questionnaire (SPQ) (Biggs 1987) and Approaches to Study Inventory (ASI) (Entwistle & Ramsden, 1983) have been used as the quality indicators for the 3-

P model and studied from an individual constructivist, social constructivist, or a cognitivist perspective with the three perspectives taking a dualistic viewpoint wherein the individual and the world are seen as independent entities and the process of knowledge is studied accordingly. Trigwell & Prosser have argued for a constitutionalist perspective using the phenomenographic approach to reflect on the relational nature of teaching and learning and re-conceptualize the 3-P model to study their conceptions. Theoretically using the phenomenographic approach, they have pointed at a major task of teaching for the teacher in creating teaching and learning situations in similar ways in which students would experience the teaching and learning content that the teacher has designed (Keith and Michael 1997; Trigwell and Prosser 1997). Trigwell et al. (2005) have also used the phenomenographic approach by developing the structural component using the elements of the Structure of the Observed Outcome (SOLO) Taxonomy (Biggs & Collis, 1982) and pointed at qualitatively different ways in which university teachers' experiences change in their understanding of the subject matter, they have taught (Keith et al. 2005). This brings us back towards understanding phenomenography as a research approach and how can the phenomenographic perspective be used in understanding the learning approaches within the architectural design coursework.

The students of architecture are introduced to various theoretical constructs in the coursework of architectural design as a part of their architectural curriculum. The study has looked at the theory introduced within architectural design coursework in the students' first year as the research vehicle to evaluate their learning approaches in subsequent years. The vehicle of the introductory theory-based model of looking at their design coursework is the most appropriate way of classifying the students' learning approaches instead of history and theory or technology; as architectural design plays a central role in the design studio through the years of their architectural education. The academic context has been explored from a historic background of literature review with the focus on approaches to learning in architectural education (Iyer 2015). This review has explored facets of students' learning approaches in the coursework of architectural design (Roberts 2006; Webster 2001, 2004), the design studio (Schon 1985); in addition to the historic and prevailing schools of thought with reference to the architectural curriculums (Bax 1991; Gulgonen and Laisney 1982; Littmann 2000). The learning approaches shall be categorized using a phenomenographic study. The physical domain of the research has been taken from an international perspective by looking at the design curricula with reference to the architectural programs at four schools of architecture including one each from United Kingdom and India; with two from the United States of America (Iyer 2014-15).

### Research Methodology

The focus of the research is to explore the approaches to learning of architecture students using the qualitative research methodology of Phenomenography. Phenomenography has been defined by Marton (1992) as "the empirical study of the limited number of qualitatively different ways in which we could experience, conceptualize, understand, etc. various phenomena in and aspects of the world around us. These differing experiences, understanding, etc. are characterized in terms of categories of



descriptions, logically related to each other, and forming hierarchies in relation to the given criteria. Such an ordered set of categories of description is called the outcome space of the phenomenon or concepts in question” (Drew, Bailey, and Shreeve 2001). Using this research methodology, the researcher can put together a “range of different ways in which people understand and experience the same thing” and “is interested primarily in surfacing variation of experience and understanding” (Cousin 2009). “Each phenomenon in our world can be seen and understood in only a limited number of distinctively different ways” and this understanding can be correlated by defining it “as the experiential relations between an individual and a phenomenon” (Marton 1992).

Phenomenography helps the researcher in mapping the experiences of the research participants based on their understandings of the phenomenon. It reflects these understandings within a limited range or categories of description, helping further in building an outcome space for the said phenomenon and the final analysis. The approaches to teaching and learning in various fields of higher education and in creative fields within design education have been studied using Phenomenography. With an emphasis on design education, literature review on phenomenography points at further research that needs to be undertaken in the design curricula for architectural education (Bailey 2002; Drew, Bailey, and Shreeve 2001; Trigwell 2002).

#### Pilot Study & Results using the Phenomenographic Approach

The pilot study looked into the architecture students’ evolution in their learning approaches by comparing the first year and fourth year of the program; charting the variation and exploring the reasons this evolution. The study was aimed to understand phenomenography as a methodology in identifying learning approaches from a qualitative perspective. A sample of thirty-nine students in two colleges of architecture in India participated in this study.

The semi-structured interviews undertaken using phenomenography; focused on the students’ approaches to learning in the architectural design coursework of first and fourth year with the design project as the learning context. The study was done on the lines of earlier phenomenographic studies to understand the variation in the approaches to learning of fashion design students based in various institutions in the United Kingdom (Bailey, 2002; Drew, Bailey, & Shreeve, 2001).

A sample of first year and fourth year students from two schools of architecture were interviewed to understand the approaches to learning with reference to their architectural design course work. A semi-structured interview using the phenomenographic approach was designed and ethical approval for the interview questions was obtained. The interviews were conducted for a sample of ten students of each year, chosen randomly from the year’s population for the selected schools of architecture. A qualitative analysis of the students’ responses to categorize the approaches using phenomenography was undertaken and used for the final study. A paper was published in a peer-reviewed journal, outlining the full project (Iyer and Roberts 2014).

Table 1 - Categorized approaches to learning adopted by First & Fourth Year Architecture Students (Iyer and Roberts 2014)

Approach A	Series of steps taken from the introduction of the design problem to the completion of the final solution with emphasis on presenting a good output and preparing a good portfolio.
Approach B	Trying to understand or experience architecture using the experiences of the faculty as a scaffold or reflecting on their instructions to present the learning outcome.
Approach C	Evolving perceptions of architecture by adopting a series of steps within the process of design which is based on a product-focused outcome.
Approach D	Evolving the perceptions of architecture through the process of design which is based on a process-focused outcome.
Approach E	Conceptualizing the thought process and using it in the evolution of architecture based on in-depth experiences directly correlative to perceptual psychology within the students' experiences.
Approach F	Students' reflecting into the conceptual and abstract focus towards design based on an innately creative and experiential level of understanding architecture.

Table 2 - The Focus on Approach to Learning (based on Bailey, 2002) (Bailey 2002; Iyer and Roberts 2014)

	Deep_-----_Surface			
Text – based	Meaning of Text		Task of reading text	
Practice – based (Fashion Design)	Visualization of concepts	Design Process		Task of producing artefact
Practice – based (Architectural Design)	Visualization of conceptual & abstract focus	Process of design based on perceptual psychology	Production, evolution & execution of design project	production & execution of design project

Table 3 – The Act of Learning Intention (based on Bailey, 2002) (Bailey 2002; Iyer and Roberts 2014)

	Deep_-----_Surface			
Text – based	To understand		To reproduce	
Practice – based (Fashion Design)	To develop one’s own conceptions	To develop one’s own design practice		To develop technical competence
Practice – based (Architectural Design)	To develop one’s own conceptions of architecture based on creative and experiential level of understanding	To develop an evolution in understanding based on perceptual psychology	To develop an understanding based on an instruction based scaffold	To develop the series of steps from introduction to completion of design project

Table 4 – Approaches to Learning activities (based on Bailey, 2002) (Bailey 2002; Iyer and Roberts 2014)

	Deep_-----_Surface					
Text – based	Organizing and integrating content			Memorizing content		
Practice – based (Fashion Design)	Relating fashion to own life world		Experimenting with techniques and procedures		Rehearsing techniques and procedures	
Practice – based (Architectural Design)	Conceptual and abstract focus based on creative & experiential level of understanding architecture	Conceptualizing thought process in evolution of architecture based on in-depth experiences correlative to perceptual psychology	Evolving perception s of architecture through design process based on a focused outcome	Evolving perception s of architecture within design process based on a product focused outcome	Understand architecture using experience s of the faculty as a scaffold to present the learning outcome	Series of steps from introduction to completion with emphasis on presenting a good output

Analysis

The pilot study titled ‘A phenomenographic study in understanding the design students’ approaches to learning the coursework of architectural design’ and its publication has given a clear direction to the final study of my on-going PhD studies (Iyer and Roberts 2014).

The pilot study using the phenomenographic and identified learning approaches adopted by the students of the first year and fourth year of the architecture program as per Table 1 that reflects a variation between product-focused to process-focused and in the direction of concept-focused approaches. Table 2 to 4 has presented a comparison between the dimensions of learning approaches within practice-based learning contexts of architectural design and fashion design; in reference to the

text-based learning context by Marton & Saljo (1976). Table 2 represents the depth in the learning approaches within the architectural design coursework in comparison to fashion design; in the overall framework of deep and surface approaches of text-based learning context. Table 3, presents architectural education in the macro to the micro realm which far exceeds the boundaries of fashion design education in the practice-based learning context. Table 4 is a comparison of the categories of approaches derived from the current study to the earlier studies done on fashion design. Table 1 to 4 represent a new dimension to the practice-based learning context of architecture education and my ongoing work within the international context dwells into the entire cross-section of the five years of the architecture program.

The identified categories of approaches adopted by first and fourth year architecture students is connected to how the concepts of deep and surface approaches to learning manifest themselves in architectural education pointing towards a more complex set of learning approaches than just a simple deep and surface division (Iyer and Roberts 2014). It also raises a further question on do the categorized approaches form different points on a continuum between deep and surface, or are some in a different dimension. The literature review on students' learning approaches in architectural education has provided further pointers from the surface to the deep dimension, through years of training and reflective practice in architectural education (Iyer 2015).

## Discussion

The approaches to learning in higher education were reviewed by focusing on deep and surface approaches to learning adopted by the students' cohort and the various student learning models that have been used to map these approaches. The review furthered looked at learning and teaching models with an emphasis on the qualitative research methodology – 'Phenomenography;' and a differentiation of the 'phenomenographic approach' from 'phenomenological approach' or 'Phenomenology.' The students' experiences of their approaches to learning with specific emphasis to learning outcomes; as foreseen by them and the teachers' community were also reviewed using phenomenography. The students' approaches to learning in architectural education were reviewed using the vehicle of theory introduced in the early-stage of the architectural curriculum within the coursework of architectural design. The review further looked at the manifestation of the approaches to learning in subsequent years of the architecture program and studies conducted using phenomenography which has helped in formulating the research methodology for the proposed research. The review also presented a general overview of the physical domain of this research on architectural education with specific reference to the four schools of architecture and the introductory theory coursework of architectural design in the early-stage of the architectural curriculums in these schools. A paper has been published in a peer-reviewed journal and through research funding, I attended an international conference on early-stage curriculum which is outlined in this literature review (Iyer 2015).

## Implications & the Way Forward

For the final data collection, a sample of the first year and advanced years students were interviewed to understand and classify the conception of approaches to learning in architectural education. This was done through a series of semi-structured interviews to explore the learning experiences of the students' cohort using phenomenography by charting the theory introduced in the early-stage of the architectural curriculum on the advanced level architectural design coursework in the subsequent years of the architecture programs at two schools of Architecture in United Kingdom and India. A semi - structured interview was prepared for the students' cohort to get an in-depth perspective on the approaches to learning and eventual outcomes using phenomenography (qualitative method). Ethical approval was obtained from the Research Ethics Committee – Welsh School of Architecture (WSA), Cardiff University for the interview and questions. As a part of the phenomenographic study, semi - structured interviews were conducted using the learning context of the design project work done in the architectural design coursework. This was done with reference to the two schools of architecture as the physical domain of the research. The interview was piloted on a small sample of first and senior students with the data being used to refine the questions. Semi-structured interviews were conducted on a sample of ten to fifteen students for each year from the first year to the final year, chosen randomly from the year's population and the design faculty from the selected schools of architecture. The interim qualitative analysis of the students' responses to categorize the same using phenomenography involved data collection through semi-structured interviews with the students on a one-to-one basis. These interviews were recorded and transcribed as per the guidelines set up by the Research Ethics Committee, WSA. The transcribed data from the students' cross-section of each school were codified manually and using NVivo; a qualitative and data analysis software. The transcripts went through a series of iterations where the experiences of the students with reference to the set phenomena within the research question were codified and de-contextualized from the original experience. These went through further iterations and were presented as categories of description with reference to the approaches to learning for each year of the architecture program for various Schools. These categories of description were then placed within an outcome space for qualitative interpretations in the form of a conclusive discussion with reference to the research question.

The data collection done at one school was analyzed using the phenomenographic approach and this interim qualitative analysis was assessed by identifying the categories of learning approaches. These interim findings were presented in a Research Seminar to get the viewpoint of experts at WSA in February 2014. Based on the interim review, the current analysis was further strengthened by a Focus-Group Discussion with a group of 6 to 8 students from each year for two schools which focused on four broad areas.

1. Theory introduced in early-stage of the architectural curriculum and its relevance in the architectural design studio
2. Role of tutors and critique in the architectural design studio



3. The design process adopted by the students in the architectural design studio
4. The philosophy of the school and its relevance in the architectural design studio

On the similar lines, data collection through semi-structured interviews were conducted at two more schools of Architecture in the United States of America. The final analysis of the categories of description, outcome space and focus group discussions is being conducted manually and using NVivo to determine approaches of learning adopted by students with a focus on the coursework of architectural design in the architecture program.

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