AN INTERDISCIPLINARY APPROACH TO PROMOTE CREATIVITY

Lyubava Fartushenko

University of Alberta, Art and Design, Faculty of Arts, 3-71 Fine Arts Building, University of Alberta Campus
Edmonton, Alberta, T6G 2C9, Canada, (780) 492 7877, fartushe@ualberta.ca

ABSTRACT

Creativity is a key factor in a well-rounded design process; without creativity, there will be no design. There are a number of practical methods for promoting creativity in design pedagogy on the undergraduate level, including an interdisciplinary approach. However, an interdisciplinary approach has not been officially integrated into the university curriculum yet. Using Canadian post-secondary design schools, this research will identify the state of the current education model, define the importance of an interdisciplinary approach and its benefits, describe creativity traits, and draw the links between an interdisciplinary approach and creativity. Design educators from 86 institutions contributed to this research by participating in a national survey; further, some participants allowed themselves to be interviewed. The fundamental goal of this research study is to find out how the integration of an interdisciplinary approach can effectively encourage creativity in the design classroom on the undergraduate level.

INTRODUCTION

Whether it is within the university classroom or in a professional field, creativity is a key factor in a well-rounded design process. Creativity and innovation are the essential components to an improved future education model. (Saebo, McCammon and O'Farrell 2006) Although creativity is difficult to measure or quantify, there are some studio-based theoretical and practical techniques for promoting creativity on the undergraduate level in design. This research study investigates how creativity can be promoted through the use of an interdisciplinary approach in Canadian post-secondary institutions that offer design.

The interdisciplinary approach to promote and encourage creativity is a relatively new method with a lot of potential for advancing teaching practices in design. It has also been used in some post-secondary design programs in Canada, although it has not been officially integrated into the curriculum yet. Researching, exploring, and testing this method will not only provide links to creativity but also should greatly benefit post-secondary design education. This research will first define "an interdisciplinary approach" and "creativity", and then draw connections between these two based on primary and secondary information gathered for this study.

INTERDISCIPLINARY APPROACH

Design as a discipline keeps on evolving and thus design academics constantly re-define design education and, consequently, propose new teachings methods. Currently, design is seen as a combination of applied art and applied science. But this model is outdated. Design educators must move away from the model of "applied" to one of "involved", "situated", and "embedded". (Findeli 2001) Since there is no consensus on the effectiveness of an interdisciplinary approach, design education still mimics the "applied" studio-based model dating back to the Bauhaus era. This research study explores further possibilities of the interdisciplinary approach, its links to creativity, and its use in design education within Canadian post-secondary schools.

Design as a field is interdisciplinary in its nature. The majority of design schools in Canada continue to use a studio-based approach as a standardized curriculum paradigm. This approach is described as "reflective practicum in designing", where students grasp concepts by trial-and-error practice and establish conversation with their teachers. (Wang 2010) During studio-time, students are also asked to become short-term experts on the areas outside of their expertise ---— including a wide range of science disciplines, engineering, programming, fine arts, psychology, and many others ---— and then propose solutions to simulated design problems by implementing their creative and technical skills. Since average design students do not possess an extended knowledge of other disciplines, a lot of issues remain unnoticed, unresolved, and unquestioned, which eliminates room for innovation, unexpected positive results, and extensive thinking outside of their own discipline. This is because design is not a simple link between art and science. Instead, both art and science should be fundamentally implemented into the classroom, resulting in a mutual flow and interchange. Design education needs to develop a system that would allow an understanding not only of planned artifacts but also "invisible relations among inner worlds of designer and the client(s) and the outer worlds of society and biosphere." (Wang 2010) Therefore, this research study examines further possibilities of moving beyond traditional and historical studio-based curriculum by proposing an interdisciplinary method as a model of establishing design in relation to other disciplines in a learning environment.

Some design educators try to incorporate an interdisciplinary approach into their studio-based classes, but there is still a lack of training on complex issues, such as behavior sciences, technology, the scientific method, experimental design, and business. There is an acute need for entire projects to be conceived in a new way, where merely presenting problems to students and asking them to come up with solutions is not enough. (Wang 2010) Don Norman believes that there should be a new form of design education "with more rigor, more science, and more attention to social and behavioral sciences, to modern technology." (Norman 2010) As a result, new kinds of designers will emerge, those who can work across various disciplines, who understand human beings, business, and technology. (Norman 2010)

For the purpose of this research, an interdisciplinary approach is defined as a curriculum structure in which the faculty integrates information, techniques, concepts, and theories from various disciplines and other fields of study to advance students' capacity to understand issues and propose new solutions that extend beyond the scope of traditional visual communication design studies. (Rhoten 2006) In this study an interdisciplinary approach refers to involving disciplines outside of visual communication design programs – including other research and study areas, professions and real clients – to participate in the design classroom. Another term that is incorporated into this research study is "intersdisciplinarity', which indicates a collaboration between various disciplines and visual communication design.

CREATIVITY

Creativity is difficult to define and characterizations vary from one researcher to another. However, having multiple definitions gives researchers a wider perspective! "Creativity is a state of mind in which all of our intelligences are working together. It involves seeing, thinking and innovating." (Saebo, McCammon and O'Farrell 2006) This statement demonstrates that creativity is the combination of many intellects and is not its own independent intelligence. While the mental process of creativity is hard to identify, "we know creativity when we see it." (Saebo, McCammon and O'Farrell 2006)

The most apparent undergraduate disciplines that require students to be creative are fine arts and arts. However, other disciplines are as creative as arts; hence, the majority of schools in developed countries are stressing the importance of creativity in their general educational system as well. "In the industrial nations, where technological and manufacturing jobs are being outsourced to other countries, there is a need for new workers who are creative and innovative." (Saebo, McCammon and O'Farrell 2006) For instance, in England researchers have put creativity on the agenda as a central element in education by claiming that "no system can be world-class without valuing and integrating creativity in teaching and learning." (Saebo, McCammon and O'Farrell 2006)

Creativity has often been regarded as a talent associated with novelty and uniqueness. (Apara and Srivasan 2010) Only since the late 19th and early 20th centuries have researchers began to develop the thought that creativity is not innate, but acquired. While accepting that creativity can be learned, there are still some people who are generally more creative than others. Even individuals with great technical talent and knowledge can be notably uncreative. (Von Stamm 2008) Aside from investigating learning processes of being creative, the main challenge of current research is to explore how creativity can be taught.

"Creativity can be encouraged, not forced." (Von Stamm 2008) There is no definite method that is proven to work for everyone. There are many principles and methods in undergraduate design education, but they can be classified roughly into four main categories: motivation, identification, fostering, and collaboration. The first principle involves encouraging students and should give them more confidence while engaging their sense of possibility. The second one focuses on helping students to identify their own strengths and weaknesses in different areas. The third principle is to foster a creative potential and enhance creativity through the process of being creative. The final principle is a co-creative process where students can create with each other or their teachers. (Saebo, McCammon and O'Farrell 2006)

This research study takes into consideration that teaching creatively does not necessarily promote creativity. *Teaching creatively* occurs when the process of learning becomes more exciting, engaging, and effective because teachers use unconventional imaginative approaches. *Teaching for creativity* happens when various pedagogical methods are targeted to promote students' own creative thinking. (Saebo, McCammon and O'Farrell 2006) The main challenge occurs when it becomes hardly possible to teach educators how to be creative because *teaching for creativity* is like an art form that you need to foster. As a result, a creative teacher is no guarantee for creative teaching. (Saebo, McCammon and O'Farrell 2006)

DATA COLLECTION

This research study consists of three main parts: survey, interviews, and testing. The survey is designed to quantify a large sample of data, approximately directed at 70 to 100 people. The survey determines the percentage of design schools in Canada that use an interdisciplinary approach, how such an approach is being implemented into curricula, and what its main advantages and disadvantages are. Interviews are targeted to collect qualitative information. They are designed for a country-wide participation, involving 10 to 15 design educators. Interviews identify teaching methods within Canadian schools, specific examples of interdisciplinary projects, and personal pedagogical experiences that can benefit the study. The last part consists of summarizing both the survey and interviews by creating a tangible testing process to be undertaken with various groups of undergraduate design students. The testing should identify links between the interdisciplinary approach and creative processes, as well as determine pedagogical methods that are most successful in promoting creativity.

SURVEY

The anonymous survey includes six questions in total. Half of those are short quantitative questions determining the participant's undergraduate program, whether the program offers interdisciplinary approach, and if it is beneficial to students. The other half is more extensive, asking participants to share methodologies for promoting creativity, to list both advantages and disadvantages of an interdisciplinary approach, and to determine whether students are more

creative if *interdsiciplinarity* is emphasized in the classroom.

Since the number of schools that offer visual communication design across Canada is substantially large, the institutions that are invited to participate are those that are officially recognized by the Society of Graphic Designers of Canada (GDC). About 420 educators from 86 Canadian universities and colleges that offer design are invited to participate. Participants represent institutions that range from four-year university Bachelor Degrees to one-year community college Design Certificate programs.

SURVEY RESULTS

Since the survey remains open to participation, the results presented here are based on an up-to-date number of participants, which totals to 72 people. 58 percent of those participants represent four-year programs, 18 percent represent three-year programs, 11 percent come from two-year programs, and the remaining 13 percent are part of one-year and design foundations certificate programs. There is also an exception within the province of Quebec, where educational system does not fall under a category of a four-year design diploma degree. Students in Quebec who intend to pursue post-secondary education must first attend a college called *Collège d'enseignement général et professionnel* (*CEGEP*), which literally translates as 'College of General and Vocational Education', before enrolling in any Quebec university. The programs that offer a complete Bachelors degree, that would be equal to a regular four-year degree in other provinces, in Quebec are only three years long. (The Canadian Encyclopedia) However, this stipulation does not interfere with the objectives of this study.

According to the survey data, 78 percent of survey participants said that their program incorporates an interdisciplinary approach into its curriculum. All participants also fundamentally believe that an interdisciplinary approach is beneficial to learning. However, about 10 percent of participants expressed their concern towards the definition and implementation of an interdisciplinary method. The wide spectrum of answers provided by design educators are summarized into five main categories:

1. STUDENTS IMPROVE CONCEPTUAL AND CRITICAL THINKING

An interdisciplinary approach gives students a greater breadth of tools with which to communicate. Students become better thinkers, conceptually and technically, when they are pushed in diverse directions. The ability to analyze and conceptualize is as important as having technical skill.

2. STUDENTS HAVE A BETTER PERSPECTIVE OF DESIGN AS AN INTERDISCIPLINARY SUBJECT

Design as a discipline is situated at the boundaries of diverse disciplines, so an interdisciplinary approach in design education is extremely beneficial in developing a holistic understanding of design. Incorporating interdisciplinary thinking, theory, and skills, which are completely transferable in the educational system, gives graduating students an opportunity to move into a range of disciplines in design. It also provides them with a wider understanding of the role of design in problem solving, and gives more focus to the process rather than to specific solutions. As a result, students gain a better understanding of the interdisciplinary nature of design.

3. STUDENTS DEVELOP SKILLS THAT ARE TRANSFERABLE ACROSS DISCIPLINES

Students gain a broad exposure to materials from art and design, interactive technology and programming, cognition, art, social sciences, media and games — they experience an education that goes beyond one focused solely on practical art and design education. Additionally, students generally have a chance to brainstorm solutions with other disciplines and thereby get a broader perspective on how design relates to the greater community.

4. STUDENTS BECOME BETTER DESIGNERS

An interdisciplinary approach is very helpful in creating good designers. To "design" is to "create an experience" and the better the designer understands the human experience, the better the output. Creating experiences is

different from gaining the skill set that young designers learn at school, which is quite the same wherever one studies. Students can perfect theirs skills at typography, colour theory, layout, and expand their knowledge on design history and theory, etc., but what will distinguish them as creative and good designers is additional learning outside of their discipline.

5. STUDENTS CAN BE MORE MOTIVATED WORKING ON INTERDISCIPLINARY PROJECTS

The interdisciplinary approach can also be more motivating for students to carry out projects. Students learn different ways of thinking and how to work more efficiently, both with others and independently, to create effective design work.

METHODOLOGY FOR PROMOTING CREATIVITY

Since the majority of design institutions continue to implement the studio-based approach as a standardized curriculum model, the main cross-contextual stimuli that are used to promote a creative process are: notes, diagrams, and models. (Wang 2010) According to this survey, the most popular method used in Canadian design classrooms is brainstorming. The next most common method is drawing or sketching, followed by mood-boards or collages. The least common method is to use a mind-mapping tool. The methods listed above were systematically presented in the survey as the options.

In addition, the survey takers were encouraged to provide other methods they felt were valuable. One common method suggested by the survey is research in design. Furthermore, about 20 percent of the participants mentioned short presentations, collaborative and independent projects, and both individual and group critiques. Some other methods identified by five percent of design educators include conceptual development, user testing, prototyping, visual research, analysis of existing projects, process mapping, and the reading and application of critical theory to experimental projects. Additional methods identified by individual participants are role playing, games, "free discussion", "blue sky approach", "nothing is wrong", "your opinion is valued", "this is the opportunity to test your voice", site-specific tours, the "SCAMPER" technique, involving music, and interpretive dance.

In addition to data collected from the survey, design educators who participated in the interview have further expanded their ideas on methodology for promoting creativity. One of the educators from Ontario College of Art and Design (Toronto) has shared the technique of "Speed Dating". It helps students to articulate the initial concept they are interested in as well as pair up for group work. The idea originally comes from speed dating, where people have three minutes to introduce each other and then move to the next table. Here students are introducing their concept to every other student in class. The benefit of this technique is that students have an opportunity to refine their thinking, and by the end of the session every student has a clear idea of what he or she wants to do. (Ladly 2011) Another educator believes that breaking down the project into small tangible parts and communicating each part individually makes students more aware of the project and inspired to be more creative. (Leroux 2011)

THE LINK BETWEEN CREATIVITY AND AN INTERDISCIPLINARY APPROACH

Creativity is hard to measure or quantify, but it is possible to identify which methods provoke new unconventional ideas in students. Collaboration in general, whether interdisciplinary or discipline-defined, is often seen as a condition for creativity and innovation. According to Sahlberg, "Only rarely is one individual able to come up with original ideas that have value with-out interacting and influence from other people." (Sahlberg 2010) Collaborating and being exposed to a wider range of disciplines can produce innovative results.

The main challenge of this research study is to identify whether students are more creative and innovative while tackling interdisciplinary projects as opposed to projects that are limited to a studio-based approach. In both the survey and interviews design educators are asked, "Do you think students are generally more creative while working on the interdisciplinary projects?" Although the majority of respondents claim that students are indeed more creative,

some design educators have doubts. All the answers provided by the 72 survey participants and seven interviewees up-to-date are summarized under five main categories.

1. INTERDISCIPLINARY APPROACH PROMOTES CREATIVITY BY REDUCING IMITATION

With regard to encouraging students to actively engage in broad critical and contextual thinking and problem-solving, ongoing evidence suggests that *interdisciplinarity* best supports that engagement.

2. INTERDISCIPLINARY APPROACH PROVOKES MORE EXPERIMENTATION

Students seem to work in a more experimental fashion when involved in interdisciplinary projects. They are able to focus their work in a more conceptual way, allowing form to follow idea rather than vice-versa.

3. INTERDISCIPLINARY APPROACH IMPROVES COMMUNICATION SKILLS

When students are asked to work with other disciplines, they are more likely to communicate their ideas in a more accessible and comprehensible way, which can benefit any project.

4. INTERDISCIPLINARY APPROACH ENCOURAGES TO GO BEYOND DESIGN DISCIPLINE

Often students stay in their comfort zone if the project is very limited and can only be applied to one specific discipline. Most interesting results often happen when students go outside of their chosen field. They can see solutions to problems that those who are limited to the field pass-by without even noticing. The use of interdisciplinary projects encourages students to explore other worlds and merge them into original and unique projects.

5. INTERDISCIPLINARY APPROACH HELPS TO DETERMINE OWN AREAS OF INTEREST

Approaching a project with a process that incorporates interdisciplinary research and visual experimentation can offer more avenues for students to find personal engagement with the project, encouraging them to insert more of their own experiences and interests. This engagement often seems to result in enhanced creativity.

The participants that are doubtful towards the use of *interdisciplinarity* raise new questions about the nature of an interdisciplinary approach, in particular its use and its link to creativity. The concerns are summarized under five categories.

1. INTERDISCIPLINARY APPROACH PROMOTES CREATIVITY ONLY IF THE NATURE OF THE PROJECT REQUIRES CREATIVITY

Students are creative if the nature of the project requires creativity. The more "wicked" the problem, the more varied the processes required to address the issue. A traditional "mannerist" graphic design education has no place in the teaching of concept development, and does not serve the current needs of Canadian industry or society.

2. INTERDISCIPLINARY APPROACH PROMOTES MORE THOUGHT THAN CREATIVITY

Students are not necessarily more creative but certainly more thoughtful, while working on interdisciplinary projects. Young students think very narrowly. Putting them in touch with other disciplines broadens their awareness, understanding, and the breadth of creative options.

3. OTHER LEARNING FACTORS HAVE AS MUCH INFLUENCE AS AN *INTERDISCIPLINARITY*

The definition of creativity is highly subjective. For example, one student's solution to a coding program could be extremely creative, while another solution could be mundane. Factors such as individual differences, group dynamics (for team work), classroom climate, previous experience, tools at hand as well as the nature of the problem all contribute.

4. COLLABORATIVE THINKING CAN SUPPRESS INDIVIDUAL IDEAS

Since an interdisciplinary approach requires working in a collaborative way, the individual gets lost in a group. It becomes challenging for a teacher to identify whether any particular student is being creative, or if the idea came as a result of collaborative thinking.

5. IT IS HARD TO IDENTIFY STUDENT'S CREATIVITY

Student's creativity is an internal state that is beyond sight. Educators can only comment on the outcome of student work. This is a complex process and other variables such as time management, class dynamics, project objectives, etc. have an impact on student's creativity.

Conclusively, the initial reaction of the majority of design educators is that interdisciplinary approach is beneficial. However, after encouraging participants to further expand on their thoughts, a clear list of disadvantages has appeared. This can add an unobstructed and unbiased perspective of *interdisciplinarity* to this study. Based on the wide range of opinions collected, the study objectives become more obtainable in terms of future testing and research.

FUTURE TESTING AND RESEARCH

Since this is an ongoing study, the next step is to test the collected data by working with focus groups and conducting workshops. The proposed testing consists of two stages. In the first stage a group of approximately 10 students is invited to participate in a real project designed by a non-profit organization outside of the university. Students are then briefed on the objectives and paired up with an expert from another discipline who should provide insightful information on the project. In the second stage students are assigned to work on a fictional project that requires them to conduct independent research and exploration. At the end students are asked to fill out a questionnaire to describe their process, experience, and work ethics. Based on the questionnaire as well as visual results (in a form of designed artifacts), it will be possible to evaluate and compare advantages and disadvantages of an interdisciplinary approach as well as its link to creativity.

Additionally, the goal is to conduct a few small-scale workshops and exercises on creativity. The results will be carefully evaluated and compiled to share with design educators.

CONCLUSION

This research study defines, identifies, and establishes links between creativity and an interdisciplinary approach in undergraduate design education. The study is designed to define which specific methods and techniques are the most applicable, reliable, and successful in design programs across Canada. Although this is an ongoing study, the link between creativity and an interdisciplinary approach is already well-defined. The next step is to continue to explore the methods, collect educator's viewpoints, and test the results. The fundamental goal of this proposed research study is to find out how the integration of an interdisciplinary approach in design education can effectively encourage creativity in the design classroom at the undergraduate level.

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