IDSA

NURTURING CREATIVITY IN STUDENT WORK

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PAPER ABSTRACT: Industrial Design Education (IDE) is a delicate balance between developing skills (practices and methods) and nurturing creativity (developing opportunities). Assigned projects need to emphasize, to varying degrees, both skills and creativity. There are two main constituencies within IDE, educators and students. Because educators develop the projects and assignments, they can be viewed as Top-Down processors; seeing the whole project and how it can be broken into different parts. Students can be viewed as Bottom-Up processors, reacting to the assigned projects. They, generally, see each individual part but not, necessarily, how each part contributes to the whole. When projects are assigned, students must review, reflect, and develop/expand ideas based on the project description (i.e., prompt). There is a propensity for design students to quickly lock on to an idea, rejecting alternate potential project directions. Quickly locking onto an idea negates exploring iterative solutions resulting in less opportunity for a new/improved project direction. Alternately, when the assignment description is too focused, it does not allow for opportunities that do not exactly match the description. Introducing ambiguity into project descriptions allows students to consider a variety of solutions and use the Industrial Design process to develop proposed concepts. Sidney Parnes says in, Creativity: Unlocking the Human Potential "…without the ability to synthesize, evaluate and develop our ideas, we achieve no effective creativity." (Parnes, 1972, p. 7) This paper will reflect on how design students translate assigned information into creative product solutions.

Keywords: Industrial Design Education, Ambiguity, Creativity, Project Descriptions, Opportunities.

1. INTRODUCTION

Imagine you are a design student on the first day of college and about to receive the first project for the semester. The description states: you can design anything you want but it must be spherical, heavy, have three holes (two if which are identical and directly next to each other as well as one that is larger and below the other two), and must have a highly smooth surface. What does this description suggest…? Does this project description suggest freedom of exploration? How often do students do this very thing when interpreting a project? "I will design X and that X will do Y and be appropriate for the Z user group." Is it not astonishing when "X" is exactly the resulting proposed design.

Industrial Design Education (IDE) should have a continual goal to produce thinkers as well as doers, typically beginning with a foundational-level learning of skills and increasing to larger conceptual designs. Project descriptions (prompts) are direct and not usually open for large amounts of

interpretation. This allows faculty the ability to isolate particular skills and allows students opportunities to develop and reinforce those skills while not, necessarily, requiring larger conceptual thought. For example, “Using your selected Gestalt Principle, design a wall mounted light.” Or “Develop a chair out of two pieces of 5’ by 5’ cardboard.” These projects provide the means of understanding the physical aspects of design, allow students to see and experience project completion, and prepare students for formal review (critique). As students progress from first-year to their second-, third-, and fourth-years of study, they must advance to larger concepts and more creativity. Too often projects are over-defined limiting freedom of exploration. How can faculty promote creativity in projects? Introducing ambiguity to the beginning of the project helps true exploration producing more innovative concepts.

2. LITERATURE REVIEW

Faculty must do their best to provide opportunities for students to grow, however, with the massive amount of education to disseminate and only four years of study, when and how projects are assigned matters. To provide the best opportunity for student growth, faculty need to encourage a solid foundation of skills and methods thus allowing for greater creative thought. To understand how to encourage creativity in students, we first need to understand how students process information and apply their knowledge to generate ideas for any design prompt.

2.1 KNOWLEDGE

When humans enter the world, perceptual learning begins by touching and mouthing objects to understand their attributes; a haptic and tactile experience. As we age, and our eyes develop, we transition to sight as our perceptual method of understanding objects. “Information about visual objects is cognitively stored in a way that ties together critical features, such as oriented edges and patches of color and texture, so that they can be identified, visually tracked, and remembered.” (Ware, 2013, p. 227) Stored information then becomes part of our knowledge and can be recalled as needed as well as be used for image-based object recognition. “The term priming refers to the fact that people can identify objects more easily if they are given prior exposure to some relevant information.” (Ware, 2013, p. 229) Priming is a method of using information to create mental images for object recognition. Another method is a tuned filter, “a tuned filter is a device that responds strongly to a certain kind of pattern and responds much less, or not at all, to other patterns. (Ware, 2013, p. 159) Both are useful when recalling visual information in object recognition. They become “…’visual phonemes,’ the elements from which meaningful perceptual objects are constructed.” (Ware, 2008, p. 160) The more information we have, the more we can recall, and the more mental images we can create. Those recalled mental images apply to objects that already exist in our world but students need to create objects that have yet to exist. How can they apply stored information to develop objects that have yet to be designed? Understanding how we access object information and develop it into new ideas involves how we process information.

2.2 INFORMATION PROCESSING

It is not uncommon for faculty to spend large amounts of time developing a project and corresponding timeline. It can be assumed that the project begins with the final deliverable and is worked backward to the kickoff. Faculty use their experience to gauge reasonable assignments/milestones to allow student for success in their work. In this case, the faculty can be viewed as Top-Down processors. “Top Down Processing is the idea that our brains form an idea of a big picture first from previous knowledge and then break it down into more specific information.” (Top Down, 2023) Faculty were once students and have transitioned to Top-Down processors and because of this, they understand where the project should end and how to keep students on track.

Have you ever heard the saying, “you can’t see the forest for the trees?” This saying basically states that you are incapable of seeing the overarching forest because your focus is on each and every individual tree. This is how many students view assignments, seeing each part like they are processing from the bottom up. “Bottom-up processing is the idea that we begin to perceive items with sensation, as opposed to our conceptual ideas….Right now, you see a computer screen…But before you could recognize the computer, you took in the individual parts of the computer: the shape of the machine, the light emanating from the screen, each of the keys on the keyboard, etc.” (Bottom Up, 2023) This relates to how we gain knowledge, beginning with small things and grow to larger concepts and should be remembered in the creation of assignments. Often times, students get bogged down on each assignment and do not “see” that everything builds up to one point, the final deliverable. Processing from the bottom-up can cause a student to view assignments as unrelated, quickly latch onto ideas, and fall short of creativity. If we can provide opportunities for students to see how each part builds to a whole, we can encourage more creative ideas.

Figure 1. Ideation Exploration Sketching of key Fob.

2.3 IDEAS

The development of an idea can be a challenging and scary task. “You stare at the paper. It stares back at you. And nothing happens.” (Emmerling, 1992, p. 58) Often when students get their project prompt, they go straight into answering questions and can be quickly discouraged if those answers are slow in coming. They do not ponder the question but see it as something to be immediately answered and all design work points to a single direction. Sketching is a way to show potential employers how a person visually thinks and tackles any problem. If all sketching points to a single direction, it is clear the problem was quickly answered and that the student did not truly explore. John Emmerling states in his book, *It Only Takes One* that you should “Stew about the ‘wants’ that surround you—but stay away from the ‘hows.’ ‘How’ questions become too specific; they can be harshly autocratic in their demand for a solution.” (Emmerling, 1992, p. 64) By asking ‘wants’ questions we give our subconscious the ability to explore blue-sky ideas. We then do not focus on ‘how’ questions and are therefore not answering the prompt too quickly and allow for more exploration. However, when they have those blue-sky ideas, there is a habit of dismissing them. “The radical idea is almost always rejected at the get-go….although many times one or more of its features would appear in the final design.” (Johnson, 2021, p. 18) Just because an idea appears to be radical or blue-sky, does not mean there are not usable elements that can be incorporated into another idea and encouraging students to pursue those ideas can also provide students the ability to connect different bits of information and develop more innovative design concepts.

Many students also have a concern about being correct—as if there were some type of answer key. They want to impress the teacher and fellow students but when that happens, they typically fall short as they are working within smaller boundaries. “Are we denied access to true innovation potential because our conscious mind is constantly saying no, telling us to proceed with caution or even stop?” (Henderson, 2019, p. 9) Trying to quickly arrive at an answer typically results in the limitation of exploration. Focusing on answering the question rather than exploring why the question needs to be answered is a very large and difficult concept for students to understand. Students might also see the exploration of different project directions as a waste of time by saying to the teacher “why, when I already have an idea?” “Ideas are hard. So, when we feel like we find one that has real teeth, we adopt it like a child.…In most cases, the first, second, and even 100th ideas are not the ones that should survive. But because we’ve grown so attached and defined by them, we can’t let them go. We drop anchor and progress ceases.…We are not our ideas” (Gresham, 2018, p. 29) When this happens, students often stay within set boundaries and have difficulty in branching out and are non-receptive to any feedback seeing that it is against them as a person and not just what is on paper. If students do not branch out, they do not comprehend the need for iteration. “…iteration is key, and that design without diligent exploration is a snipe hunt or design-by-ego.” (Rasche & Zlevor, 2019, p. 48) There is the chance that an idea may be successful from the beginning but is will not be until other options have been explored. But how is that exploration possible and how can faculty encourage that in students?

3. CREATIVITY

"Creativity is thus a function of knowledge, imagination and evaluation. Without knowledge, there obviously can be no creativity. By way of an analogy, we might consider the kaleidoscope wherein the more pieces we have in the drum, the more possible patterns we can produce, Likewise, in creative learning, the greater our knowledge, the more patterns, combinations or ideas we can achieve." (Parnes, 1972, p. 6–7) The different "pieces in the drum" are our experiences and the resulting patterns become mental images of ideas. When we have more experiences we can add pieces to that drum allowing for the creation of more mental images. "Understanding mental images is critical because design is a creative process wherein some parts are done as mental images, and some parts are done by a sort of hybrid between mental imagery and normal seeing where design elements are cognitively added to incomplete sketches." (Ware, 2008, p. 150) Connecting the two and relating them to a project prompt becomes a possible project direction. These directions do not, necessarily, always become the final. By using the mental images, sketching them on paper and pinning them up, they can be evaluated as appropriate or not or be combined to make new ideas. "…the more elements in one's experience, the more new relationships he is able to concoct; and again, all other things being equal, the more new relationships he concocts, the greater the chances of his producing a potentially fruitful one." (Parnes, 1972, p. 7–8) These fruitful relationships mean nothing if not subjected to the initial design prompt and evaluated as to their appropriateness. "The effectiveness of creative productivity also depends, of course, on the evaluation and development of embryonic ideas into usable ideas. Without knowledge, imagination cannot be productive…And without the ability to synthesize, evaluate and develop our ideas, we achieve no effective creativity." (Parnes, 1972, p. 7)

It is the faculty's responsibility to introduce projects with the most opportunity for exploration and creativity. Tom Kelly writes in The Art of Innovation that a brainstorm session needs "…a well-articulated description of the problem at just the right level of specificity." This holds true for project descriptions. They should provide enough for students to begin without being too narrow. For example, "'spill-proof coffee cup lids' would be a bad brainstorming topic because it's too narrow and already presumes you know the answer." Faculty also need to be careful that project descriptions do not focus too quickly on a product solution such as, "bicycle cup holders, is too dry and product-focused. Maybe bicyclists shouldn't use cups at all, in which case they certainly don't need cup holders. A better, more open-ended topic would be 'helping bike commuters to drink coffee without spilling it or burning their tongues." (Kelly, 2001, p 57) Project prompts that are open-ended and without too much focus provide students more opportunity to be creative.

4. DISCUSSION

Nurturing creativity in students is a combination of faculty lead and student driven work. Faculty provide a framework for the project and students develop the specific direction within that framework. Consider the mental image of an infinite hallway that is lined on both sides with open doors. Having every door

open can be daunting similar to a blank sheet of paper. Every criterion closes doors that do not relate to it. Closing too many doors does not support creativity nor does having too many open. Carefully imposing project criteria, and closing a select set of doors, provides a starting point. Students then use information from the prompt and find their own direction for the project. As students' progress from foundational learning into larger concept learning, it is the faculty's responsibility to guide them away from limitations toward exploration. This can be done with the project descriptions and criteria, encouragement for students to ask why and what questions rather than how, provide opportunities for experiential learning and discussion, and helping them to see how each assignment relates and builds to become the overarching project.

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