Course Design Reimagined:
Using Novice Experience to Teach Expert Knowledge

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ABSTRACT
Learning a new skill or topic can be daunting experience and when a person learns from a person, an expert in the field or someone certified to teach the material, the action can seem almost mysterious. In order to facilitate the experience better, a better approach may be to allow others in similar situations handle the instructing or at least shape how the instruction is delivered. This may allow all those on equal footing relate to the experience better and consequently connect various details in a manner that seems more intuitive. With this premise in mind, a new course in a challenging subject matter was designed based on the journey of someone with zero experience in the field.

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INTRODUCTION
In today's education curriculum, most material being designed is done so by various experts or leaders in the field. Curriculum design varies between each country but the overarching theme is leaders and experts decide what to learn and then require experts to facilitate that learning process [1]. However, while avoiding the debate on the selection of topics, should the facilitation of the material be more ad hoc or formalized individually and by those learning the material?

Why might that approach serve the learning process better? What if there is a disconnect between the expert or chosen facilitator and those trying to gain the knowledge [2]? My experience with the topic chosen is that many times instructors and experts assumed they knew the best approach or the reason a student was confused. While many times their experiences with similar situations served them adequately to justify their assumptions, many times the disconnect proved to be discouraging for struggling students. If the instructor doesn't understand why I'm confused then maybe my situation is unique or worse, maybe there is something wrong with me individually? That struggle between those that truly understand the material or even those tasked with following rigid guidelines can cause great rifts in the knowledge required to truly understand the topic or to crucial components of it. If disconnects establish early on then it stands to reason more challenging aspects of the topic will seem more complex to the student, sometimes at the confusion of the instructor.

What if the learning process was being dictated by fellow novices or those on similar knowledge footing? King [3] points out that collaborative learning allows students to feel more engaged both with their grasp of the concepts but with the others in the process. That responsibility motivates the students to help each other truly understand the various barriers that may block those struggling on a key point. Relating to my own experience again, the core of people I was tasked with learning with developed a similar team mentality which helped us decipher issues that each of us encountered and in turn share how we overcame them. That outside look from a less intimidating origin encouraged students to share things that bothered them more freely. When that occurs, everyone realized their situation was not only unique but there were potentially numerous solutions for handling it.

Zone of proximal development (or ZPD) was developed Lev Vygotsky in 1978 and he established its definition as:

> the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem-solving under adult guidance, or in collaboration with more capable peers [4].

What Vygotsky is describing is a 'zone' in which a student has achieved a certain understanding however, with the assistance of an instructor or capable peer, a push can be achieved to facilitate a deeper or better understanding. Wood, Bruner, and Ross [5] established what they referred to as scaffolding, which is a process "that enables a child or novice to solve a task or achieve a goal that would be beyond his unassisted efforts." Together these two processes, which have been linked since their inception, formulate the backbone for what is used in ensuring novice lead instruction is successful.

My hope is the course designed by own learning process and experiences, showcase a template for how this process can be applied to wide range of skills and topics. As I focused on learning, the research I did, the instructors that interacted me, my peers I interacted with established the flow for me to master the subject at hand. One note, it stands to reason that if all students engage in this same activity there will be a multitude of curricula taking shape. That issue and solution will be addressed later.

It is important to point out that experts are not shunned in this process. In fact, their knowledge and assistance is widely accepted an encouraged. A lot of the course material utilized is a collection of various experts and the knowledge they must share. Utilizing those that have paved a valid path is wise however, the focus is showcasing that using experts as the single source of truth can be problematic and in fact less efficient.

Figure 1. Makerspaces, like the one shown above in Urbana-Campaign, have become popular throughout the world as people interested in learning and working together to learn focus on various projects.

RELATED WORK

Makerspaces (shown in Figure 1), "physical location where people gather to share resources and knowledge, work on projects, network and build" [6], are a popular phenomenon happening around college campuses and Trust, Maloy, and Edwards [7] point out that they should be used directly in the classroom. They discuss how they currently occur in dorms, libraries, common areas, and more organically, however a major opportunity is being missed by not utilizing them directly in the classroom. They believe college campuses should push to incorporate this style of education which encourages a more student involved approached to interacting and assisting each other to develop the focused skill. This group effort learning and obtaining a goal encourages the above-mentioned team mentality that students strive to ensure their success and the success of others if they are properly given the responsibility.

There are other ways being explored, and encouraged, for students to shape the curriculum and learning approach. Supiano [8] describes how the University of Dayton took a subject matter with less than enthusiastic desire from students and developed the course with feedback from students. Ultimately this lead to an increased buy-in from both faculty and students which leads to greater enthusiasm for the course. The process taught the faculty that a lot of nuances they never considered as detrimental could be improved to encourage. While this approach is not squarely in line with the focus here, it proves how allowing the learners to have any impact on the material encourages involvement and gives instructors insight they previously missed.

One format that seemingly would be in line with the focused approach is online platforms such as Udemy. What those platforms allow is non-accredited or seemingly anonymous 'instructors' to create and post material portraying themselves as experts in the field. Ultimately reviews and recommendations can be a shield, raising quality guidance to the top and hiding unhelpful or inaccurate material. That solution will only work with popular subjects. More obscure topics will have less attention and therefore less scrutiny. Some guidance or oversight is necessary to ensure accuracy and consistency.

COURSE MATERIAL

The material [9] utilized to setup this course revolved around my desire to learn how to acquire and ride a motorcycle. My interest began from a loose collection of sources that did not offer a defined walkthrough of the various steps or if they did leave out key components. I was able to finally design the course with the steps I took to achieve the 'mastery' status I preferred, but I did so with the guidance of some established curriculum, such as the dmv.org's motorcycle guide [10]. The material involves a mixture of publication and expert video guidance (shown in Figure 2), but ultimately revolved around the thought processes and experiences I dealt with.

Figure 2. Experts from RevZilla created a video discussing the various motorcycles that a beginner should consider and why. The video served as important information for myself and was used within the course.

Ownership Interest

The first section dealt with discovery why someone would be interested in owning motorcycles and what the advantages plus disadvantages are. Each of the topics include:

1. Why Get Into Riding – This unit covers various reasons people consider riding and what led to my decision as well as cost considerations a potential rider may be unaware of.
2. Brands and Stereotypes – For this unit information about brands themselves as well potential stereotypes that may be encountered a new person may be unaware of consequently wish to avoid.
3. Motorcycles and Where to Start – Knowledge of individual types of motorcycles is covered since there is a much vaster world than many may realize. However, there are certain bikes that are better for beginners, and those are discussed as well.
4. Motorcycle Safety – Safety is cornerstone for motorcycles because of the serious risk of danger, as GQ points here there is a 30-fold greater chance of death in motorcycle crashes than car crashes [11]. Discussing safety and the motorcycle safety course while considering becoming an owner may make or break someone's desire. That is important to figure out early.

Becoming an Owner

With the next section, it is assumed the participant is enthusiastic and ready to become a motorcycle owner. The units for this section cover:

1. Search and Purchase – The first unit deals with the various pitfalls and resources to lean on when searching and selecting a motorcycle. Avoiding mistakes purchasing a used motorcycle and being aware of what occurs when purchasing a new one, as well as the various outlets to search on are all covered.
2. Getting the Gear – The importance of gear can't be stressed enough. This unit dives into the various things every rider needs and tries to include a decent gauge on the costs associated.
3. First Rides – Assuming the person has their bike and gear, the first rides are important for fundamentals. This unit goes over what to practice while also following myself on what I focused on and achieved (shown in Figure 3).
4. Thoughts and Issues – This unit is dedicated to a lot of items I've come across through either predicament I encountered or various struggles I had. I wanted to illustrate them to assure that these are the sort of situations to be cognizant of and that they are normal.

Gaining Experience

The last section revolves around building on the fundamentals established and illustrating the various pitfalls of riding that many first timers encounter. The units in this section include:

1. Building Confidence – After the first practice rides are complete, riders should push themselves to more challenging (and practical) situations. The point of this unit is to cover those new challenges and help build the confidence necessary to feel ok riding to any destination.
2. Dealing with Issues – With new challenges comes new obstacles and the point of this unit is discussing those obstacles. After the fundamentals have been established and riders attempt more challenging situations there are things that will arise that even the motorcycle safety course did not cover with any depth, if at all.
3. Achieving Daily Rider – The final course's unit will go over the joys that become motorcycle riding and how to ensure that enjoyment. It also focuses on things that can occur to riders as they become more comfortable and how that can be a negative thing. It also showcases my last trip and how I believe I've achieved a status that I'm confident in taking my motorcycle anywhere at almost any speed.

Figure 3. Throughout the course, I included personal videos of various experiences including my visit to the dealer I ended up purchasing my motorcycle from, the store I bought my gear, and mostly various rides I did to gain the experience in real time (image of riding video shown above).

Engagement

Finally, user engagement with this course is important due to the disconnect between the skills needing practice and the participant practicing them. My fear throughout the course is that a student could simply read and watch all the information until the end, and consider the course complete. Therefore, throughout the course various quizzes (shown in Figure 4) were used to facilitate some user engagement and assist with critical information retainage.

METHODOLOGY

There are various ways that could be used to test the material and if the approach is successful. Some examples desired include:

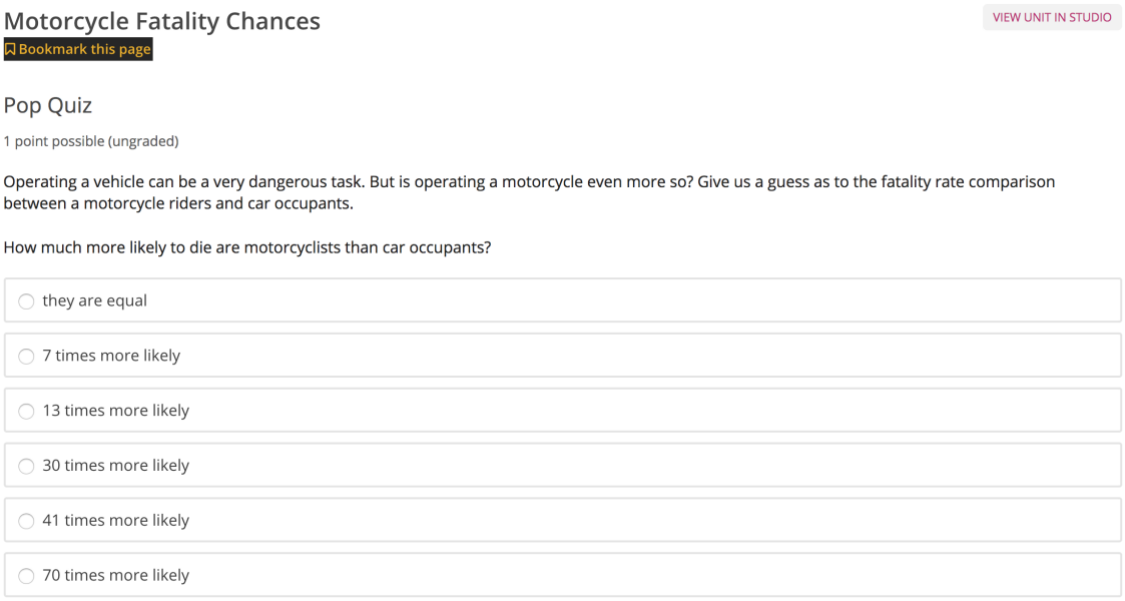

Figure 4. An example quiz that is given in the course. The focus here is to reinforce how dangerous motorcycle riding can be.

- Allow two groups of random students complete two 'courses', this one designed by a fellow novice peer with expert guidance or free-form find what information they can and then test knowledge and skills at the end of the exercise
- Bring in various experts to attempt the course and return feedback based on things they may have learned as well as comparison with their experiences as a beginner.

Unfortunately, none of the above or any other in-depth planned forms of testing were utilized due to time constraints. Peer and mentor feedback was received though and that allowed for a lot material shaping and determination as to the success of the course format.

RESULTS

Learning how to ride a motorcycle takes time and a lot of practice. There was a fear that I would not be able to reach the desired state of experience in the allotted time. In fact, I do wish to have gained a bit more experience and showcase more challenging skills in the last examples I provided. Overall, I think the content achieved the desired goal of the course. However, did it achieve the desired goal of novice experience as a tool of teaching and curriculum shaping?

The best evaluation tool available from outside perspectives belonged to our courses peer evaluation and my mentor. The results were positive with only one semi-negative mark. Below are excerpts from randomly selected peer feedback as well as my mentor's thoughts:

- Peer 1 – "Your course looks really nice so far. The format is really engaging since you are using videos, photos, and text descriptions, the pacing looks good…"
- Peer 2 – "This seems like such a cool idea. I wonder if your course can also be further used for DMV especially since it includes the safety part..."
- Peer 3 – "I like that you were able to adjust the section based not only on what you accomplished, but on what you think would be a better flow for learning and moving through. I wouldn't worry about the feeling that you haven't done a great deal, as what you've done so far is setting the stage well. You're learning a new platform (along with a new vehicle) and that's going to take time…"
- Peer 4 – "…Its well-structured and provided in right phase wise manner…"
- Peer 5 – "…Going through you course, I felt like I was reading a blog instead of taking a course. I would like to see more original content in your course and less pictures and videos from other people…"
- Mentor – "…this is a great mix of practical advice (like be wary of Craigslist ads) with specialized advice showing your own research. .... Your honesty in this process is going to be helpful for viewers. Everything you describe resonates with my memories of learning to drive a manual transmission when I was 19. …"

The limited results show the flow and formatting was in fact inviting in the subject matter and the reviewers were at times able to relate to the thoughts and struggles I was going through. That feeling helps establish the team mentality that this format of education strives to achieve.

CONCLUSION

The course based on the minimal feedback and my outlook turned out both good in content and great in showcasing the intended goal. As someone who was completely new to the

world of motorcycles I could research for my own gain, work with others, and compile resources, experiences, and various thoughts into a course I believe can help anyone become a motorcycle rider.

The flow of the course centered around similar expert derived courses while simultaneously following my own brainstorming and thought processes. The feedback received showcased some of the connections I made and how others could either relate or understand why

At times, it felt as though I leaned on expert knowledge and guidance too much. However, a skill such as motorcycle riding is very difficult and simultaneously dangerous. Incorrect, bad, or misunderstood advice is potentially fatal, which is not something an instructor would like to be responsible for.

Limitations and Future Work

As mentioned above I believe this project has been successful in a few different regards, however I have mentioned some of the various drawbacks and limitations throughout. The following will illustrate what I believe were some of those as well some directions I would like to see it expand to.

Limitations

The testing and validation methodology needed more time and expansion. Two of the methods were listed above, using experts to evaluate and more formal peer trial, and both could offer great insight into the material and format. The time limitation for completion of this project proved to be a difficulty in the evaluation and with future iterations hopefully is not a factor.

Another limitation, which may apply to the entire approach, is attempting to apply this system to all subjects. There may be certain topics that in which expert instruction and supervision of the curriculum is a necessity. One such topic, learning how to perform a complex and life-saving operation, could have catastrophic outcomes if a novice explored with loose expert supervision. Subjects such as these most likely will require the classic form of education processes.

Future Work

Expanded subjects should be explored with novice experience and scaffolding. Learning how to ride a motorcycle worked for this experiment due to my lack of knowledge on the subject and interest to become more educated. I would like to attempt more subject matters with their results better evaluated.

Applying novice experience teaching at scale could have various implications and results which need to be evaluated and understood. Online platforms like Udemy were scrutinized earlier for the lack of oversight and the same issue could arise here with various ‘novice’ instructors tackling similar subjects. Especially if each participant approaches the subject from different angles with different knowledge backgrounds. The solution may ultimately lie with an expert in the subject compiling the experiences and content into a sort of master collection. This would return the curriculum control to the expert but still retain the heart of the premise, using novice experiences to help teach. I would like to experiment with multiple contributors and then enlist an expert to pool the resources together and build a fluid curriculum.

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