The Art of Creative Problem Solving

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Several years ago, my department was invited to a luncheon with President Clark Gilbert. As we settled in, we had the opportunity to visit with and get to know one another a little better. At one point in the discussion, President Gilbert asked, “What is the most important thing that your department does for its student population?” It was enlightening to hear the responses from my colleagues as they shared their thoughts and insights. During these types of discussions, I’m normally the type of individual that is happy to sit back, listen, and silently process the discussion. However, during this exchange, I experienced a moment of clarity and felt subsequently prompted to share it. Timidly, I raised my hand and stated, “We train our students to be problem solvers. The creation of art is nothing more than having a problem that needs a solution. As art faculty, we strive to equip our students with the understanding of creative problem-solving processes and the skills necessary to understand, address, analyze and appropriately solve those problems.”

Around this same time, I found myself being drawn into the art of lutherie — the field that deals with the design and fabrication of musical stringed instruments such as guitars, violins, etc. I slowly immersed myself in this area and found that I just couldn’t shake the idea of lutherie being just another problem in need of a solution. As I conducted my research and experimentation on the processes and methodologies surrounding lutherie, I also spent a fair amount of time researching and reflecting on the topic of creative problem solving. I would like to share what I discovered by addressing three primary topic areas: 1) The need to clearly define the problem, 2) Developing fluency regarding the problem, 3) Dealing with the unexpected.

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Defining the Problem

Early in my research and work phases, it became apparent to me that a poorly defined problem produces poorly executed solutions. Through a series of small-scale failures, coupled with trial and error, I came to recognize the following contributing factors to a poorly defined problem:
Common Issues with Defining the Problem
Before we jump into exploring how to define a problem, I’d like to address some issues that impede our ability to do so. These can include:

- Avoiding generalities - Often, a poorly defined goal is one that simply does not provide enough specific information regarding the problem. Details are critical when formulating concrete goals. Simply stating “I will build a guitar” doesn’t answer the questions regarding style, aesthetics, acoustics, etc.
- Avoiding tangents or misinterpretations of the problem - Once you have clearly defined your problem, do you revisit it often enough to ensure that you are staying focused? Additionally, if the nature of the problem organically evolves as you strive to resolve it, are you recognizing that change of direction and appropriately reframing the problem?
- Avoiding Bias - It is incredibly easy to bring old biases to the table when attempting to solve new problems. These biases can be foundational to the way that we perceive the world around us, yet they also can hold us back when discovering something new. As I tackled issues related to lutherie, I discovered that bias was an unfortunate, recurring issue for me. Given my training as a visual artist, my natural tendency was to put the visual design of the instrument first. With that emphasis, I was overlooking the purpose of the instrument. It was meant to be played, not simply hung on a wall as a piece of art. In addressing my problem, I needed to address who would be the beneficiary of my instrument. I reached out to a number of professional musicians and asked them what they looked for in selecting an instrument. The general consensus was that the primary concern was how the instrument sounded with the secondary concern being how well it played. The visual design typically fell to the bottom of their lists of concerns.

Recognizing the Scope of the Problem
Understanding the general scope of the problem that we are trying to solve can help tremendously. Looking at the entirety of the problem helps. It will define the complexity of the problem and the level of investment that will be required of us. The following areas can do this:

- Research - Much can be accomplished by conducting simple research surrounding a problem. A myriad of resources exists online, in books, and through networking. You may find
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that a lot of your problem-solving groundwork has already been done by someone else.

• Understanding the components involved - What materials will I be using? What are the physical properties of those materials? What resources and tools will I have access to? What type of operating budget will I have? Identifying and understanding variables such as these will help you to better anticipate the process of working towards the solution.

• Understanding your operating parameters - Will the nature of the work require special precautions? Will it require specialized training or research and development? Will the work need to be accomplished in a certain space? What are the time frames involved?

• Defining the risks involved - Project risk is something that is defined as an event that can occur that can impede certain project goals and objectives (Wiley, 2012). We should attempt to exercise some foresight to anticipate potential issues that we may encounter and attempt to preemptively enact solutions.

Visualization
All the aforementioned points direct us to this the importance of visualization. In regard to the need for visualization, legendary New York Yankees catcher Yogi Bera famously said, "If you don't know where you are going, you'll probably wind up somewhere else," (Fogler, LeBlanc & Rizzo, 2014).

Problem Fluency
In 1998, I was a new missionary serving in Belo Horizonte, Brazil. Despite studying Portuguese for two months in the MTC, I distinctly remember feeling lost and disoriented as I attempted to directly engage the native speakers. It wasn't until I was able to develop cultural and linguistic fluency that I began to feel comfortable in my role as a missionary. As I've slowly worked at developing a new set of Lutherie-based skills, I’ve revisited this concept of fluency.

Learning a new language.
BBC published an article in one of their travel columns. It was written to help travelers quickly pick up a language and suggested that the following steps could be taken:

• Take risks and speak the language whenever you can
• Read children's books and comic books in the foreign language
• Consume foreign language media
• Immerse yourself in the local culture.
• Make use of free foreign language podcasts and apps
• Don’t practice in isolation; get feedback from native speaker
• Don’t worry about making mistakes (Budden, 2015)

The summative point of this article was that mastering a language required an individual to fully immerse themselves. The article illustrated that this process doesn’t have to be overly complex and that resources are
readily available. As we strive to solve our own unique problems, what resources are available to us to aid us in that full immersion and subsequent problem-based fluency?

Embracing the language.
It is often not enough to simply learn and understand the language associated with a specific set of problems. We need to adopt and use the language as we strive to solve the problem. I found this to be true on two fronts:

- When I initially began to interact with professional luthiers, I found it difficult to engage them meaningfully when I didn’t fully understand the jargon of their industry. Some luthiers were patient and others dismissive as I discovered that there was a fluency issue that I needed to address as I conducted my research and built my network. As I’ve worked on developing fluency in the language of this field, I have had a much easier time interacting with others in these areas.

- As a missionary in Brazil, I recognized that my fluency truly began not when I learned to simply speak the language but when I learned to think in it. Similarly, I have found that as I adapt my cognitive processes to use the vernacular and concepts associated with a problem, I am able to develop solutions more intuitively.

Mileage and Experience.
Another important factor in problem solving revolves around the amount of experience we have in a particular area. The more experience we have, the easier it is to naturally solve the problem. However, problems often arise that fall outside of our immediate area of expertise. When I was a graduate student, one of my instructors taught me that when unfamiliar problems arise, I shouldn’t shy away from the situation. Instead I should strive to quickly gain some measure of expertise in that area. While this sounds daunting, I have experimented on this logic and have discovered that it is possible to quickly acquire experience. This can come in the following forms:

- Borrowing it - Why reinvent the wheel? Some simple research into another individual’s problem-solving processes can go a long way. How can their workflows be directly utilized or adapted to suit your specific problem?

- Prototyping – Prototyping (and/or role playing) can allow an individual to experiment with situations, vocabulary, processes, tools, and mediums in a safe and low-risk environment. This can be done as a rehearsal for enacting the actual solution.

- Reflection - In tackling issues related to our problem, we should plan to set aside some time for personal reflection. I regularly do this on the front end of a problem in an effort to strategize a plan of attack. I’ve also found that this is helpful as a self-assessment on the back end of an enacted solution. Evaluate your definition of the problem, your formulated outcomes, and your enacted solutions or process. And then be prepared to do something with the insights you gain.

- Appropriation - Sometimes we can find solutions to our problems in unlikely areas. In the book
Creativity, author Mihaly Csikszentmihalyi notes that a number of Nobel laureates were distinguished by their ability to apply an idea, concept or solution from one discipline to another (Csikszentmihalyi, 2013). I found this concept of finding solutions in other disciplines to be incredibly beneficial as I struggled to engineer the body of a bowl-backed instrument. In exploring potential solutions, I discovered pattern transfer techniques commonly used in sewing. This technique provided me with a highly efficient solution to an issue that had tied me up for several days.

**Becoming vs Doing.**
True creative problem solving is so much more than simply enacting a solution to a problem. It means becoming so immersed in the problem that we are able to rely on feeling and intuition to help us progress. This has the benefit of producing lasting confidence in the part of the problem solver. This will ultimately lead to enlightenment and inspiration. We will not be so absorbed in the issues that we are tackling that we can’t listen to the Spirit.

**Being Prepared to Deal with the Unexpected**
As I explored the problems associated with the various types of instruments that I was building, varying degrees of failure and other unforeseeable mishaps regularly reared their ugly heads. While these setbacks were never a welcome occurrence, I had to learn to shift my thinking to accept them as opportunities. This change in attitude helped stay the hand of discouragement and enabled my optimistic and creative side. I largely attribute this to the following practices:

A. Embracing Risk. There is a quote from legendary radio talk show host Barry Farber that I have learned to whole-heartedly embrace. "There is no reward in life without risk,"(Harvey, 2017). It’s not just enough to accept that there might be risk. We should desire to create it.

B. Adopting a "Yes, and?" attitude. This is something that I learned from improvisational theater. When one person spontaneously introduces an element into a theatrical sketch, the other actors must accept and incorporate it into their performance. This attitude saved my emotional state on more than one occasion. In one particularly poor call, I ruined a $250 piece of wood. I wanted to curse and swear. I wanted to start punching things. I think I cried. But in the end, I was able to say to myself, "Yes that happened. And it was terrible. Now, what am I going to do about it." This gave me the resilience to keep moving on.

C. Be Flexible and Adaptable. As mentioned earlier, visualization is an incredibly important part of solving problems. However, it is not always possible to envision every situation or set of circumstances. When you will encounter unanticipated issues, step back from the problem, reassess it, redefine it if necessary, reformulate new strategies, and resume working through your solutions.
D. Remain Optimistic. Above all, choose to be optimistic. An optimistic mind is one that is flexible, adaptable, open to risk, and willing to accept and learn from setbacks.

Conclusion

The preface to the book Strategies for Creative Problem Solving offers a wonderful analogy for creative problem solving. It suggests that we need to develop skills analogous to a sharp pair of scissors with two special blades. The book states, “One of the shears is made of the knowledge necessary to understand the problem and to develop technically feasible solutions. Of course, no cutting can be done—and no problems of invention can be solved—with just one shear. The other shear contains creativity that can generate new and innovative ideas. Likewise, creativity alone will not necessarily generate solutions that are technically feasible—and no cutting can be done with just this single shear, either. Instead, the combination of creativity with a strong technical foundation allows us to cut through the problem to obtain original solutions,” (Fogler et al., 2014).

Whatever problem that you or your students are trying to solve, the processes and exercises that I have laid out will aid in both understanding the problem and enacting creative solutions to resolve it.

References