

Designing Creativity Support Tools for Failure

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ABSTRACT

Creative tools today strive to amplify our ability to create high-quality work. However, experiencing failure is also an important part of mastering creative skills. While experts have developed strategies for engaging in risky experiments and learning from mistakes, novices lack the experience and mindset needed to use failures as opportunities for growth. Current tools intimidate the unsure novice, as they are designed around showcasing success or critiquing finished work, rather than providing safe spaces for experimentation. To better support experiences of failure for novices, we instead propose flipping the value of failure in creativity tools from something to avoid to something to pursue actively. To do this, we develop a taxonomy of creative activities that people engage in when they aim to succeed. We then invert this taxonomy to derive a new set of creative activities where deliberate failure can provide a path towards creative confidence. Lastly, we envision possible creativity support tools as examples of the potential value of supporting activities where failure is encouraged and showcased.

Author Keywords

Creativity support tools; failure; design; novice.

ACM Classification Keywords

H.5.2. Information Interfaces and Presentation: User Interfaces — *User-centered design*.

INTRODUCTION

Creative tools today amplify success, helping creators put their best work on public pedestals. Online creative communities such as DeviantArt [3] provide online galleries for artists to showcase their work. Likewise, creativity support tool design principles developed by HCI and CSCW research communities aim to bolster creative output [16] or decrease friction in engaging in creativity [15]. The goals of such tools include preventing mistakes [17] and helping novices emulate expert work [10]. Creativity evaluation metrics also reflect this desire for success, often aiming to maximize the number of likes and remixes [31], number of completed projects [28], or scores by expert judges [19].

However, this stands in stark contrast to our understanding that *failure*, rather than success, is central to mastery [24]. Writers such as Ira Glass [23] have expounded publicly on the role that repeated and purposeful failure played in their eventual success; rejected academic papers receive more citations when eventually published than those accepted on first submission [13]. Effective deliberate practice of a skill involves continuous corrective feedback to learn from mistakes [22].

However, for novices, a downward spiral forms: novices need experience in order to develop competence in a task or skill, but fear of failure prevents them from engaging in opportunities for growth. Expert creators are able to engage in an iterative process consisting of many experiments to develop the ideas and skills needed to produce a final piece [32] in order to learn both what will and won't work [9]. Novices, in contrast, tend to attribute perceived failure to lower self-worth [18], and will often perform tasks according to context-free rules they've learned in the past [11] rather than adapt their creative process as needed. Current sources of creative support suddenly become more intimidating than helpful: DeviantArt focuses on showcasing art rather than providing a safe space to experiment, critique communities only critique finished or close-to-finished works of art, and online learning communities often ignore beginner work and target feedback-giving efforts towards those who can demonstrate promise.

With this in mind, we propose *flipping the value of failure in creativity tools*: rather than viewing failure as a cost to avoid, what if creativity tools and communities viewed failure as a positive outcome?

Drawing on existing examples of creation tools and creative communities, we develop a taxonomy of common creative activities that occur when the creator's goal is to aim for success. We then derive new types of creative activities that arise when the goal is instead to aim for failure to help expand the possible design space for creativity support tools. Lastly, we envision potential tools that support some of these activities as examples of future work in this space. In this paper, we focus on novices in artistic communities surrounding domains such as drawing, painting, and music, but we anticipate our findings could apply to other domains in future work.

RELATED WORK

We focus on understanding and designing for a particular aspect of the creative process: experiencing failure (especially for novice creators). To inform our work, we look at how current tools and communities support failure as well as existing theories about how people persevere in the face of challenges.

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Failure in Creative Tools and Communities

A number of tools support exploration of a creative space by supporting rapid and rough prototypes of the envisioned goal (e.g., SILK [27]). Additionally, one of the most common ways existing creator tools explicitly respond to failure is by providing an undo function [29], allowing creators to experiment, then backtrack if the attempt is judged unsuccessful. However, backtracking can often only happen linearly, such that if a new experiment is made, the old experiment is no longer accessible. Furthermore, “undo” implicitly assumes a stance that failure is mostly negative and is something to be recovered from rather than encouraged. In this paper, we explore the benefits and limitations of other possible responses to failure in creator tools through design.

Art and design education has traditionally followed the studio model [20], facilitating peer learning and social motivation by providing an open and shared environment for students to work [30] as well as helping students iteratively improve their work through public critiques from instructors and peers [32]. Online creative communities (e.g., ConceptArt.org [2]) often try to emulate this method of peer learning by providing forums where artists seeking to improve their skills can put forward their best work in order to receive feedback from a community of other skilled artists. However, such communities can sometimes discourage creativity and risk-taking by punishing those who fail to post “good” work with negative social consequences [6]. Other communities, such as Reddit’s /r/sketchdaily forum [5], center around learning and practice of skills, providing drawing prompts and a central location where community members can post responses to prompts and view responses from others. However, unlike in a studio, this is often where the community’s involvement in a novice creator’s development ends; community members can provide critique or motivation to participate in a larger activity, but do not typically offer on-going guidance for how to understand or react to critique or how to tie what they learn from daily sketches into larger work. The novice must — somehow — figure out how to learn from their experiments and failures on their own.

The Art of Failure

Psychology distinguishes two ways in which individuals view intelligence and learning: individuals with a *fixed mindset* believe that intelligence and talent are innate abilities that are fixed from birth, while individuals with a *growth mindset* believe that intelligence and talent can be developed over time [21]. These mindsets can lead to different behaviors in contexts where opportunities for learning arise; those with fixed mindsets will avoid tasks where the risk of performing poorly is high, while those with growth mindsets will anticipate learning from challenges. Similarly, those with high *self-efficacy* (the strength of one’s belief in one’s own ability to complete tasks and achieve goals) exhibit a higher ability for learning and performing tasks [7], and possess robustness in the face of failure [18]. People with low self-efficacy are more likely to interpret criticism as a critique of themselves as a person rather than a critique of the work [26]. Understanding how people change from a fixed mindset to a growth mindset

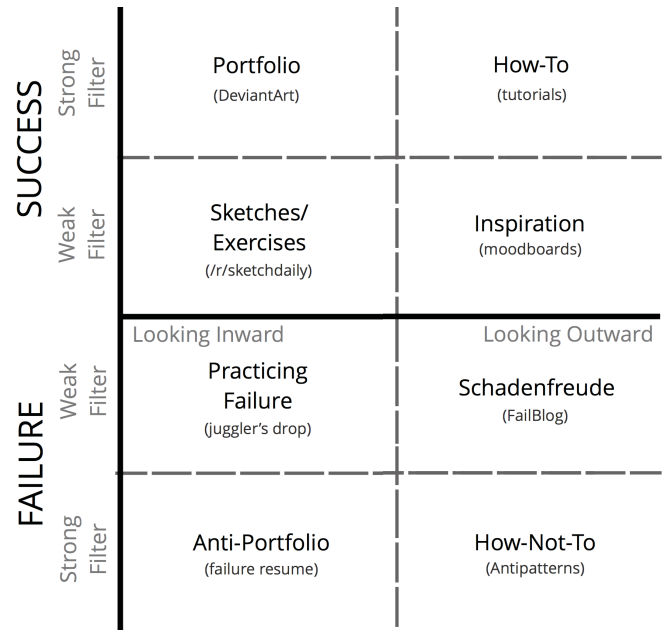


Figure 1. A taxonomy of creative activities according to how strongly they filter for success (top) and failure (bottom).

may be the key to designing tools that support novices in developing creative confidence and in responding to failures in ways that facilitate growth. Video games are an example of an activity that successfully produce high self-efficacy behavior despite repeated experiences of failure. Video games do this by designing for *flow* [25]; games are careful to only expose failures to players when next steps towards progress are clear (even if the end solution is not). Carefully measured exposure to negative experiences may produce positive changes in attitudes towards those experiences [8].

Therefore, we hypothesize that exposing or encouraging failure in a measured way may help creators (especially novices) practice developing strategies for growth and perseverance. By viewing failure as something to be encouraged rather than avoided, we open up new design spaces for the types of creativity support tools that could exist.

CREATIVE SUCCESS AND FAILURE

The attitude a creative tool or activity takes towards failure can be seen in how it asks a creator to filter what has been produced. In our taxonomy, *filtering* refers to how strictly the creator filters produced content for quality. A weak filter activity (such as sketching) tends to accept mistakes and experiments, while a strong filter activity embodies high standards of approval — only the best of what was produced remains. We also consider *where* filtering is directed: is the creator looking inwardly and filtering their own work, or are they looking outwardly and filtering work by others? Though other members of a community certainly also judge created work, our taxonomy of filtering takes the perspective of a creator who is making judgments of their own or others’ work *during their own creative process or development*. The top half of Figure 1 shows the resulting taxonomy populated with

examples of commonly practiced creative activities where a creator filters for success.

In activities where creators look at their own work with a weak filter for success, the goal is to practice certain skills. Examples of such activities usually focus on producing a large quantity of small pieces of work, and include brainstorming, prototyping, and doing daily sketches.

When creators use a strong filter for success on the work they produce, their goal is to showcase their best work. The act of creating a portfolio falls in this general area; creators perceive high risk in failing to judge their best work correctly and are thus motivated to judge their work according to a high standard.

When creators use a weak filter for success on work created by others, they usually seek inspiration. A consumer browses others' work and judges them in order to broadly explore work related to their personal tastes or a current project.

When creators use a strong filter for success on work created by others, they are able to closely study others' specific creative processes. The process is sometimes documented in some way (for example, through video recordings or tutorials) for use as a resource for learning how to do something well.

It is also possible for creators to engage in co-production. Examples of such activities are critique (where creators put forward their best work and receive feedback) and peer mentoring (where creators receive feedback on work that is not necessarily finished or polished). While not shown, it may be that these activities lie somewhere at the boundary between the left and right halves of Figure 1 — that is, the boundary between a creator and an external creative community.

Inverting the Design Space: Designing for Failure

The activities in the taxonomy above all strive towards some notion of success, differing only in how strongly a creator filters out work judged as less successful. We may be able to reveal creative activities that are not commonly supported by existing creativity tools if we instead strive to filter for failure, either by filtering out successful attempts or preserving unsuccessful attempts. We show the possible taxonomy that could result in the bottom half of Figure 1, which mirrors the taxonomy in the top half of Figure 1.

When creators view their work with a weak filter for failure, they also create quick experiments and sketches; however, instead of practicing to improve techniques or skills, these activities encourage users to practice reacting to failed attempts. An example of such an activity is the method of practicing dropping balls when learning to juggle to make failure seem more normal than success [14].

When creators view their own work with a strong filter for failure, they focus on showcasing their worst work. An example of an activity in this area might be the anti-portfolio [1], a collection of investment mistakes and missed opportunities sometimes published by large venture capital firms. A failure resume [33] is a similar document for individuals. By

owning their past mistakes, creators can begin to view them as opportunities for growth rather than moments of shame.

In activities where creators use a weak filter for failure on work created by others, failures are collected for the purpose of spectating, often for humorous purposes. Movie bloopers or curated websites like FAILBlog [4], for example, fit in this part of the taxonomy.

When creators use a strong filter for failure on work by others, they also access a glimpse into others' creative processes. However, rather than focusing on how others did something correctly, creators may study failed attempts in order to learn what not to do (i.e., antipatterns [12]).

The boundary between the left and right sides of the bottom of Figure 1 also denotes activities where creators and others collaborate; however, this may involve a creator presenting failures rather than successes to others as prompts for critique or discussion.

FUTURE WORK & CONCLUSION

Focusing on what we can learn from failure, rather than fixating on how to achieve success, can change how we approach creative work. Mistakes become helpful signposts pointing our way to excellence, and failure becomes an event rather than an inherent reflection of self-worth. What would happen if creativity communities and tools helped us look for opportunities for growth rather than opportunities to maximize likes, upvotes, or reblogs?

In this work, we generated a design space centered around encouraging failure and demonstrated new opportunities for creativity support tools. For example, a tool that helps novices *practice failure* might be a community where novices are rewarded for producing a quantity of work by being able to “pay” for mentoring from experts by their show of effort. An *anti-portfolio* may point to tools that are the inverse of showcase websites such as DeviantArt, where people post work they do not like or did not finish with explanations for the failed work to aid in peer reflection and social motivation. As another example, a tool designed around *schadenfreude* might help people curate work according to what they dislike. However, rather than simply allowing people to gather generically bad work, the tool might help artists curate mindfully and purposefully, according to the artist's current project or goals (e.g., “interior designs I don't like”); even negative examples can help creators overcome design fixation [34]. A *how-not-to* tool might expose a creative process with a focus on failure; rather than producing a step-by-step guide for how to do something well, an artist might produce a step-by-step guide documenting their unsuccessful attempts at a new technique.

These examples are only a glimpse into the possible ways we may be able to fill the gaps in support for novices left by current creative tools. By explicitly designing to encourage failure in creative tools and communities, we may better enable creators to not just achieve but also grow.

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