Thinking Outside the Box: Novice Designer Perspectives and Recommendations for Template-Based Graphic Design Tools

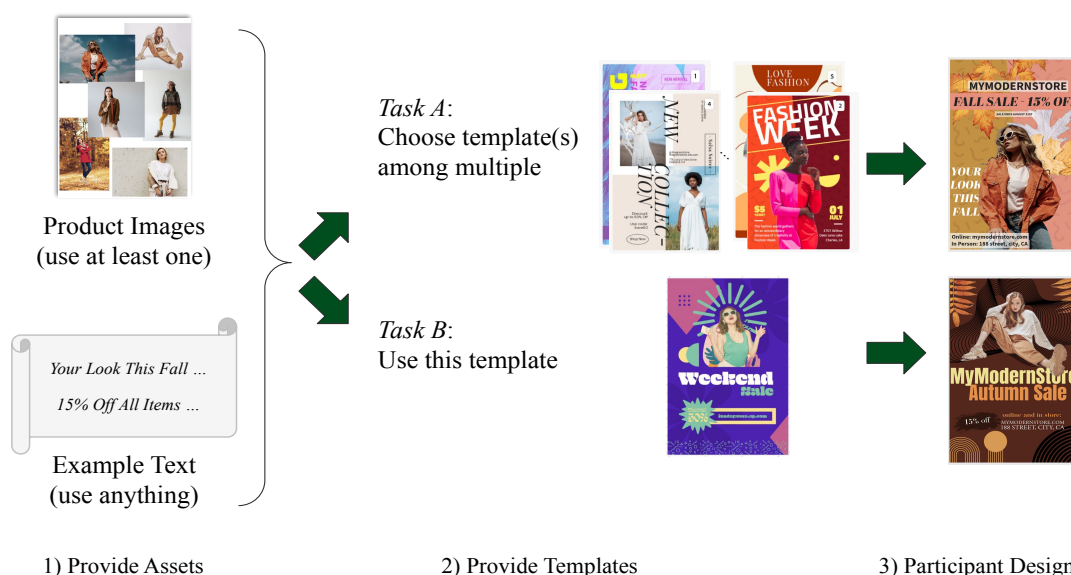ANONYMOUS AUTHOR(S)

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Fig. 1. The design scenario in our study: Participants (novice designers) were asked to create an advertising poster given product images and some example text, to simulate real-world use cases. In a within-subject study, *Task A* provided participants with 9 templates to choose from, while *Task B* forced them to use a particular template, for the same design scenario. In both tasks, participants customized the template(s) to create their own design.

Many digital graphic design tools provide design templates to help novice designers quickly get started. Users often have assets (e.g. images and text) that they want to incorporate when starting their design. Existing interaction schemes may be insufficient to help users adapt a template to work with their assets and hinder their sense of creativity and productivity. To investigate the effects of templates on novice designer workflows, we conducted a think-aloud design workshop (N=10) where participants designed posters

using one or more templates, followed by semi-structured interviews. Our findings show that while templates help users converge to a final design quickly and partially alleviate the need for tedious decision-making, they may also lead to fixation and frustration when interactions do not support divergent thinking and flexible editing. We present design recommendations for creativity support tools (CSTs) that make use of templates, to address novice designers' creative and practical needs.

CCS Concepts: • **Human-centered computing** → **User studies**.

1 INTRODUCTION

Providing expert-made templates is a popular way of scaffolding and guiding novice designers in the graphic design process. Templates are often curated and presented in graphic design tools (e.g., Adobe Express, Canva, Powerpoint) to help users get inspired and provide a starting point for their design process. Research has shown that examples, defined as materials or previously-created artifacts that can contribute to the design process, help design professionals in various steps of the design, such as providing a framework or direction for the project, facilitating ideation and stimulating the generation of new ideas, or providing a reference for evaluating generated solutions [7]. For novice designers, templates serve as a form of examples that can be used to focus their attention on important design aspects in the domain of interest [8, 16]. Templates have also been shown to be helpful in guiding users through a predefined path to valid solutions [22] by providing initial constraints for the vast design space [19]. The paralysis from facing too many possibilities and the 'blank page' effect [10] can be mitigated to some extent by leveraging templates before starting the design. In graphic design tools, templates for posters, fliers, etc. are provided as complete, one-page documents with example text and image assets, and users are encouraged to edit them for their own purposes.

Previous research has shown that while templates are valuable as design starters [17], they may also cause restrictions in users' creative explorations [8, 16]. In the context of graphic design, one such scenario may occur when users enter the design process with their own visual or textual design assets and ideas, and are challenged with adapting the existing template into a form that fits their own text and image assets. It is unclear whether current interactions with templates are supporting novice designers with these issues. Moreover, there is a lack of insight into how the selection and use of templates in graphic design tools are steering the creative process for novice designers and affecting their productivity. This paper bridges these gaps by investigating novice designers' use of templates, understanding the pros and cons of current interactions with templates in shaping design workflows, and exploring opportunities to improve graphic design tools to meet user needs more effectively.

Our research questions are as follows:

- **RQ1**: How does the existence and variety of templates affect users' design flow, sense of creativity, productivity and satisfaction?
- **RQ2**: What issues do novice designers experience when integrating their own assets into expert-made templates?
- **RQ3**: How might current template-based design tools improve to support novice designers in their workflow, while addressing the above issues?

To address these questions, we used Adobe Express[1] as a case study, which is a graphic design tool that provides templates as a starting point (An overview of the tool can be found in Appendix A). We recruited 10 novice designers for participation in a within-subject think-aloud workshop, who completed two poster design tasks using the tool. To understand the usual novice designer workflow, we created a scenario in which a user is assigned a poster project and provided with some assets and goals, and has limited time to finish the task. In one task, users had access to nine templates to choose from, which helped us examine how the variety of templates (i.e. access to multiple design instances) helps inspire them with further ideas. The second task, however, forced them to use one template. After each design activity, participants were interviewed about their experience and reflected on their design workflows, especially in relation to the use of templates.

2 RELATED WORK

Prior research in analogical reasoning has assessed how the use of examples similar to a design problem can affect the design process and outcomes [1, 23]. Expert designers make use of examples for inspiration in multiple stages of design [7]. However, it appears that exposure to examples can lead to design fixation, which occurs when the designer reproduces features of the examples frequently, leading to limited exploration and output generation [9]. Studies have shown that examples that are more similar to the problem at hand, or are more familiar to the designer tend to cause more fixation [23].

Templates, as used in digital CSTs, are example designs that are usually similar to users' target problem and ready to use as a customizable design. Previous work has demonstrated the role of templates in scaffolding the design process for novices, in various domains such as storytelling [11], user experience design [17], online learning [22] and professional writing [8]. More recently, generative text-to-image models have been used to create template artwork that follows the style of an artist [2]. While these studies have demonstrated use cases on templates in several domains, little is known about graphic design templates and how they impact novice designer workflows. This paper bridges this gap in understanding and proposes future directions for creativity support tools for graphic design.

3 METHODS

The goal of our study was to understand how design templates impact novice designer workflows, what issues they face in the process and whether their sense of creativity and productivity is impacted by the use of templates.

3.1 Participants

We recruited 10 participants (3 men, 7 women; age range 21-32) from among employees of a large technology company, through group messaging channels. None of the participants identified as professional graphic designers and some had experience designing posters using Canva, Microsoft PowerPoint or similar tools.

3.1.1 Procedure. Each study session took 75 to 90 minutes to complete. The first 10 minutes involved an on-boarding activity, where the researcher provided a sample poster design task and explained various functionalities of Adobe Express. Once a user felt comfortable using the tool, we presented the design scenario, which was consistent across both design tasks. We then provided the participant with a link to the main project, which consisted of multiple pages corresponding to the two tasks in the study. Counterbalancing the tasks was performed to avoid bias from carry-over learning effects, leading to half of the participants beginning the study with *Task A* while the other half started with *Task*

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[1]new.express.adobe.com

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B. We also instructed participants to think out loud at all times. After each task, we conducted semi-structured interviews that probed on participant's template and design choices, points of frustration and satisfaction, and perceptions of creativity and productivity.

3.1.2 Design Scenario. We developed a poster design scenario to simulate a real-world activity and understand organic behaviors of novice designers toward template-based tools. Participants were asked to design an advertising poster for a fictitious clothing store, and advertise this store's new collection of garments for the upcoming autumn. Some assets (i.e., images and text) were provided, as well as a set of design requirements. These included: targeting customers who are in the age range of 15-21, have a modern and chic and warm look and feel, convey autumn vibes, and a confident tone of text. Figure 1 illustrates the design scenario and the two tasks that participants completed using the provided assets and templates.

The selection of assets provided to the participants included: 1) a few product images (models wearing the garments) from which at least one was required to be included in the design, 2) some example text that can convey the message and holds the website and address of the store, and 3) some optional assets with photographic or graphic elements.

3.1.3 Tasks. Users completed two tasks: *Task A* required users to browse and select a template among nine different options; and *Task B* required users to use a preselected template. In both tasks, we emphasized to participants that they do not have to stick to any features of their initial template(s), to avoid fixations that may originate from requirements. We also recorded the time taken to finish each task. Paired-sample t-tests on this time showed no significant difference between *Task A* and *Task B* across all participants.

Task A:. This task involved choosing among a set of nine pre-selected templates that the user could use to start their design process. The templates were all relevant to advertising for clothes and included keywords such as 'sale' or 'limited offer', and addresses. Templates did not meet all the requirements of the project to encourage participants to edit the design as needed. Since we were interested in observing natural behaviors with the templates, we also did not set any requirements for how participants should use the template (e.g., edit a template in place or copy parts of it in a new page).

Task B:. For this task, participants were told that their client has suggested one template to be used to begin their design process. In this case, they were not allowed to use any other templates for inspiration.

3.2 Analysis

We used Rapid Qualitative Analysis (RQA) [27], a technique used to gather and analyze actionable, targeted qualitative data within a shorter timeline than traditional qualitative methods [27]. We used RQA for analyzing qualitative data from interviews and think-aloud activities. A description of this approach can be found in Appendix B.

4 RESULTS

4.1 Designing with Templates: Two Approaches

Users take two general approaches to leveraging templates: 1) Choose one template to start from and add edits in place (**customization approach**) and 2) Borrow assets and ideas from multiple templates and combine them in a blank canvas (**mix-and-match approach**). These approaches were mainly highlighted in *Task A*, where participants had to

choose among or use multiple templates, and constitute the two ends of the spectrum of design approaches found in our study.

Figure 2 shows these design approaches along with two participant designs for illustration. P6, for example, began the design process by choosing a template that she thought already looked modern and chic, replaced the images with two of our provided product images, and began iterating on changes to color theme, text, and embellishments. On the other hand, P4 observed that one template was more suitable for the target audience given its modern, boxy layout, while another matched the fall vibes requirement due to its brown-orange color palette. Hence, she created a new page, copied some assets from the former template and others from the latter, while manually making edits to match other aspects with her chosen templates: "*It's about setting the mood and bringing the pieces together, right? You already have all these inspiration pieces (template options) here, but it's like you want to bring the parts that are particularly meaningful to you in one place*" [P4]. In this case, the collection of shortlisted templates served as creative inspiration for the user to create their own design. We also observed participants who used approaches in between, e.g. starting from one template and editing it to look more like another template. The existence of multiple approaches to using templates is inconsistent with the paradigm assumed by current commercial design tools, which steer users toward using a template as an initial stencil for their design.

4.2 Template Choice as a Design Step

To choose template(s) among the available ones, all participants spent a few minutes browsing through the available templates, discussing their pros and cons in terms of how much they match the project requirements or their personal preferences, or how similar they look to other designs they have seen. When reflecting on their choice of template(s), most emphasized that they would like to minimize the changes they would have to make after choosing a template: "*I consciously went for a template where I wouldn't have to change too many things*" [P1]. For some, this decision-making was based on the color theme of the template being relevant to an autumn palette (including brown, red, yellow and green), and the subjective modernity of the template. Some participants mentioned that they chose a template that is "*not too busy*" and "*closest to a blank canvas*" [P2], such that they would not have to make decisions about multiple elements in terms of removing or keeping them.

It is worth noting that while in this short study, deciding to use a particular template was a one-time step, in a longer and more realistic design process, a user may determine that their choice of template was not optimal and iterate on that decision while making other edits. In fact, participants in our study raised this as a concern: "*I had a choice between a lot of templates and I didn't know if I chose the right one*" [P2]. One participant even felt he made an error in this step, and was unable to recover from it due to time restrictions and the complexity of doing so: "*I missed the fact that the audience of the poster are teenage girls, and I had already started working on that template which now I feel is better for an older age group*" [P8]. Even more, not being able to change the template selection led to further avoidance from taking risks in his design: "*I worried I might make choices that would make the design ugly, so I played safe and didn't add any embellishment.*" [P8]. Looking at template selection as a standalone design choice may thus be a first step to recognizing user needs for guidance in this step and recovery from suboptimal decisions in time crunch.

4.3 Templates: Facilitating vs. Constraining Exploration

We identified a number of ways in which novice designers may feel constrained in exploring the design space. For those with a mix-and-match approach to design, not having a space for divergent thinking felt restrictive, as they had to make unnecessary efforts to explore various design trajectories using the existing interactions in the tool. Templates
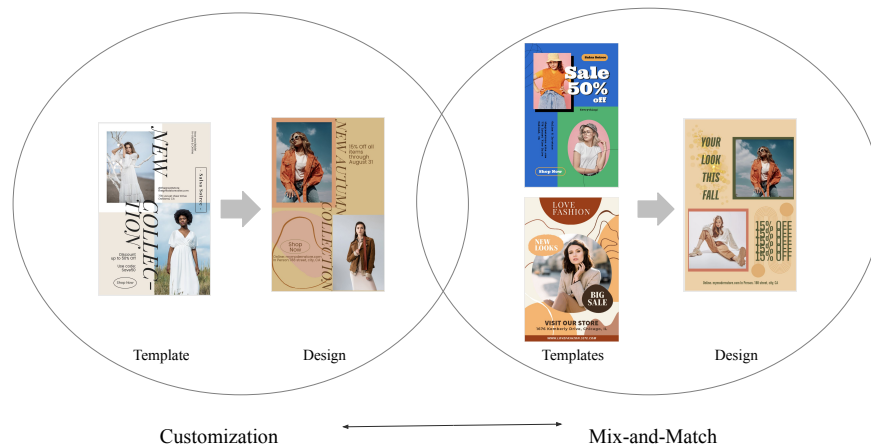
Fig. 2. The two main approaches to using templates in our study, which can have overlaps (in-between approaches such as starting from one template while gaining inspiration from another).

are previously-completed designs by expert designers, which made them difficult for some participants to adapt them to their own assets. This issue was exacerbated in some cases by the lack of expertise and confidence to make edits in the seemingly-perfect templates, leading to frustration and limited risk-taking. A lack of space for trial and error further made users fearful of making major changes and limited their creative exploration.

Lack of Space for Divergent Thinking. We found that participants with higher motivation to create novel designs by mixing multiple aspects of templates felt constrained by the existing interactions, as they had to move back and forth between pages to view multiple templates and draw inspiration. One participant suggested that she would rather have a curation space, such as a mood board within the tool, and see all templates and assets of interest in one frame or move between them seamlessly: "*I want my own curated mood board somewhere [accessible] around here*" [P4]. Most existing graphic design tools prescribe a more linear approach, assuming that users choose a template first and then make iterative edits. We observe these assumptions are not well suited to support users who start their design from a mix-and-match approach.

Feeling Restricted by A Complete Design. Templates in both tasks were found to be well-designed around their original assets, making them difficult to adapt to the new assets that participants intended to use. P3 highlighted this by explaining that his chosen template in task A had a modern, muted look and feel that he liked and wanted to keep, and that look was emphasized through the model images' backgrounds which showed light blue skies and dull nature scenes. Replacing the template images with the required images disrupted that look. To work around this, the participant decided to change the template's color palette entirely. Many participants also used the template as a guide for layout, which sometimes came with frustration: "*It's just a template and you have to adapt things to your own project. But I feel like it's harder to adapt things from a template because you're trying to make 'that thing' work, like shoehorning it, and sometimes it's just easier if you start from nothing*" [P5]. Frequently, participants felt stuck finding a good place for their images or text, and ended up either sticking to the original template layout and "*playing safe*" [P8] or editing things

and not being happy with it as if "*something feels off*" [P7]. Being unsure how to edit a template, in fear of ruining the design, could lead to frustration and low confidence: "*I'm more frustrated with myself than with the tool, I'm just not a good designer*" [P8]. Templates can be perceived as completed designs. Novice users may experience frustration from not knowing how to edit a template and fear making a mistake as the template looks too final.

Fear of Trial and Error. Lastly, a fear of trying new ideas was observed in some participants, as they were unwilling to change the template design and regret their decisions later. As an example, a couple of participants found assets that they liked, but they first wanted to check if they would look good in the design. Since they only had one page at their disposal, putting those assets in the template was conducive to a more permanent change in their work than they intended, one that can disrupt the current state of other assets. To this end, a few participants expressed the need for a trial and error space outside of the main canvas.

4.4 The Creativity-Productivity Trade-Off

An important goal of our study was to assess how design templates contribute to the sense of creativity and productivity that novice designers experience. We found that feeling creative can sometimes be at odds with feeling productive, and that templates are viewed as tools that increase productivity but may impact creativity in a negative way, depending on how a user defines creativity. The variety of templates was found to influence these perceptions based on how users approach design (i.e. with a customization or a mix-and-match method).

Perceived Productivity. Almost all participants referred to templates as a great starting point that saved them a lot of time: "*otherwise there is no way I could have finished this [poster] in thirty minutes*" [P8]. For some, starting a design from nothing would have felt daunting: "*I had something (the template) to work with and wasn't starting from a blank canvas, which can be very stressful!...The template already tells you that if you put some image here and some text here, it works*" [P5]. This initial push was deemed valuable especially as users were designing for practical communication, where they have a goal of what they want to communicate but need design help to communicate effectively. The templates therefore generally led to a sense of productivity.

Participants had varied opinions about what creativity means to them and how creative they felt in each task. We report findings about creativity by breaking them down into two definitions of this term, as brought up by our participants.

1) Creativity and the Extent of Contributions. In general, participants felt more creative when they were able to make more edits to the initial templates. Some participants that using a template did not impact their sense of creativity in cases where they tried a number of design ideas and moved or replaced assets [P1, P5], while some others felt the template made them feel lazy as it already included most necessary assets and did not seem to need much change in some cases [P6, P9].

Since *Task A* involved selecting a template, some participants felt this led to decision fatigue and they were not able to focus as much on the design itself. Since *Task B* gave them a pre-selected example, it allowed them to focus instead on completing the project requirements: "*In [Task B] I knew I had to use this template, so the question becomes what can I do with it?...It brought down the number of decisions I had to make*" [P2]. As the focus shifted toward the design task given a template, these participants felt more creative experimenting with more granular details such as colors, fonts, embellishments and layout changes. On the other hand, participants who were more interested in mixing various

design elements from multiple templates (mix-and-match), as discussed in Section 4.1, reported feeling most creative when they were exposed to a variety of templates (i.e. in *Task A*).

2) Creativity and the Quality of Output. A number of participants considered an aspect of creativity that is related to the quality of their design [P3, P5, P6, P8]. In particular, these users felt more creative when their design "*looked more creative*" [P8]. For example, the fact that the templates were designed by experts helped some participants think about styles that they "*otherwise would have not considered*" [P6], such as novel ways of overlying assets. P8 emphasized: "*...because I built on the template the result looks better than starting from scratch, so I feel more creative in that sense*" [P8]. Even though these users admitted that they did not contribute much to these ideas, the exposure to novel design paths gave them a sense of creativity and satisfaction with the result. For participants who had this view, there was no difference between tasks A and B, as the perception of creativity was oriented toward the end result and not process-dependent.

It is important to note that, not only most participants felt more productive due to the existence of templates, but they also actively made choices that would minimize the necessity for future efforts. As discussed in Section 4.2, a majority of decisions with regards to the choice of template(s) and edits were made based on the extent to which they would alleviate the need for edits or major decision making down the line: "*I felt a bit less creative because I get lazy and don't want to think for myself what I do about the assets. But I don't feel it's a bad thing for me, it just increases my productivity*" [P9]. Hence, perceptions of productivity can be in conflict with the user's extent of contribution, which itself impacts users' sense of creativity. Understanding this trade-off may help with designing CSTs that optimize both of these notions, while taking into account the user's practical needs (e.g. designing in time crunch vs. leisurely).

5 DISCUSSION AND RECOMMENDATIONS

Our study highlighted important issues that novice designers face when designing using templates. We observed multiple approaches to design, which can have implications on how graphic design tools may support various users. In this section, we discuss our findings from an interaction design perspective and recommend ways to improve current template-based graphic design tools.

5.1 Support decision-making while recognizing different types of users

For most novice designers, a relief from constant points of decision-making is an important appeal for using templates. Due to their lack of design expertise, these users need guidance to understand design aesthetic rules, choosing the right template for their project, selecting fonts that match, and color combinations or layouts. At a higher level, users also need support connecting a given project brief with design elements and styles (e.g. determining what a 'modern' font looks like), or judging whether a template is flexible enough for their creative moves.

While many current tools support automated suggestions, they often lack an awareness of the current design or project requirements, and scrolling through all recommended options is tedious. Many novice designers therefore use templates as a guide for these principles by inferring expert design decisions from them. However, our findings show that choosing an appropriate template itself is part of the design process, and even when chosen, templates are only the start, as users have to adapt them into a more suited design for their particular project. Crowd-sourced feedback [30] and dynamically-updated recommendations for the template selection, fonts [6, 24], colors [25] and layout [20] are among potential solutions to these problems. Enabling users to filter the provided options in a tool's library may also

give them a more precise control, e.g. by adding tags such as 'modern' to fonts that are often used in modern-looking posters.

Interactions with current template-based graphic design tools often assume that users will choose a template and customize it for their purposes. Most suggestions and decision support mechanisms (such as font suggestions), therefore, come into play after the template has been selected. However, our study showed that the importance of recognizing and supporting all users in ways that may be tailored to their approach. For example, users with a mix-and-match approach may benefit from suggestions on how to combine favorite assets they have gathered into a novel design, while those with a customization approach may prefer to select one template and choose among various layouts suggested for their design.

5.2 Encourage exploration through supporting divergent thinking and iterations

Templates can be, and to some extent are, used as inspiration for design decisions, e.g. by providing example assets, colors, fonts and styles that may be applicable to a user's project. In our study, this behavior was observed more frequently among participants with more of a mix-and-match approach. Particularly, we found that the *choose template-apply to canvas-edit* paradigm was found to be confining and frustrating to these users and creativity was highest when they were exposed to a vartiety of templates (i.e. in *Task A*). To give users access to various design ideas and facilitate exploration before converging into a solution, creating a space for collections of templates, images and text in the form of a mood board was recommended in our study as one method for facilitating divergent thinking. This finding is consistent with previous work that supports the effectiveness of example curation in supporting idea generation [12, 14, 15, 29]. A mood board space may help users browse through the template options as filtered by their project requirements, collect pieces that are particularly meaningful to them, and use ideas from favorite templates to make decisions about their own design.

Design is inherently an iterative process. It is inevitable that a user experiments with a design idea and realizes that it does not fit the project, their own preferences, or design aesthetics [3, 4, 26]. Users may also sometimes be in a time crunch, which not only makes them more prone to mistakes, but also increases the pressure they feel when errors occur. Hence, it is imperative that computer-based tools account for smooth recovery from errors and iterations [21]. In the case of designing with templates, this can be done by developing a scheme for managing assets and ideas within the tool such that multiple iterations of one's own work can be seen and used. This strategy has been shown to aid sense-making and reflecting on design ideas for novice users [15]. Creating a sandbox space or an asset drawer where users can store materials for later use, adding hide/unhide controls for layers, including multiple canvases for alternative designs, and integrating version control capabilities into the tool may help reassure novice designers that their decisions can easily be reverted, thus encouraging creative risk-taking.

5.3 Balance productivity and creativity by identifying meaningful tasks

Novice designers in our study were found to have various definitions of creativity and factors such as output quality can gauge their sense of creativity. However, we observed that some novice designers experience design fixation as a result of using templates, and become resistant to changing the original templates due to the completeness of the template, in line with previous research [5, 17]. Within the study scenario, a majority of users felt most creative when they made edits and contributed to the final design output, which is consistent with previous studies that highlight the role of engagement in creativity [18]. That said, making more edits often takes longer and compromises productivity. In

our study, productivity itself was found to be a benefit of using templates and automated suggestions, pointing to a potential trade-off between two important roles of templates.

To balance users' needs for both productivity and creativity, CSTs can identify meaningful tasks that contribute to the design process, such as choosing a color combination. For these tasks, suggestions that can be vetted by the user are often preferred, as they offer users agency and freedom to make their own design decisions, while also providing guidance to the novice user. On the other hand, more mechanical and redundant tasks can be fully automated, as they do not significantly contribute to the user's decision making and thus may not give them a sense of creativity. An example of these tasks in our study was replacing the original image in a template with a user's image, and applying similar formatting as the original. This task is essential when using a template, but it is also quite tedious. Automatic execution of such activities can reduce the cognitive load on users and increase their productivity by allowing them to focus more of their time on the more important steps of the design.

6 CONCLUSION

The use of templates is a common, yet under-researched approach to guiding novice designers in graphic design. This paper contributes to understanding the design process with templates, how the current interactions limit or foster creativity and productivity, and the impact of template variety in stimulating idea generation. We discussed implications of these results to inform the design of creativity support tools for graphic design.

7 ACKNOWLEDGMENTS

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A   OVERVIEW OF ADOBE EXPRESS

Adobe Express has semantic search and browsing functionalities to find templates that relate to any topic (e.g. wedding invitation) for any type of one-page document (e.g. poster, flier, social media post, etc.), along with a stock of searchable assets that may be used to customize the template. A user may, however, decide to begin a design from scratch, which can be done by creating a blank page and adding one's assets to it. For each image, icon or graphic asset that a user includes, multiple formatting options exist, including background removal, recoloring, cropping into various shapes, etc. Text content can be formatted using font selection, sizes and artistic effects, and a list of recommended fonts are provided to the user when they select a textbox. At any point during the design process, a user can also change the background color of their page, or select a color theme among multiple options with semantic tags (e.g. retro or classic) which recolors all shapes, background and text with a palette that is associated with that tag. Users can also move, resize or rotate all assets, or transfer them to various layers of the design. A Screenshot of this tool can be found in Figure 3
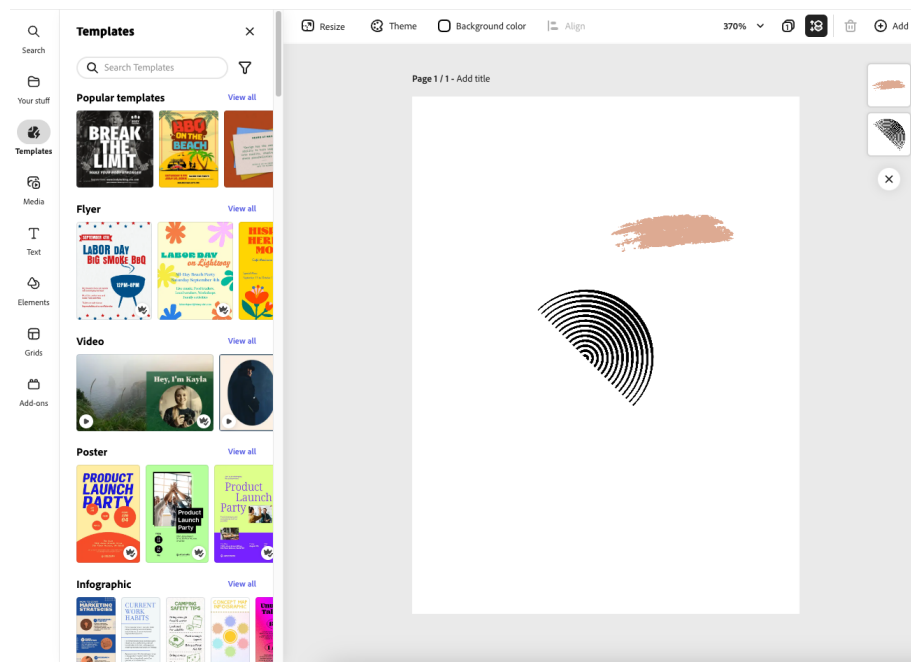
Fig. 3. Adobe Express Environment. The left pane shows a stock of templates that a user can choose from and customize for their own purpose. The design canvas is in the center, where the user may add assets to. Layers of assets can be set from the far-right pane, so that one asset is on top of another.

B   RAPID QUALITATIVE ANALYSIS

We used Rapid Qualitative Analysis (RQA) as the method for analyzing qualitative data from interviews and think-aloud activities. This analysis method is an applied technique used to gather and analyze actionable, targeted qualitative data within a shorter timeline than traditional qualitative methods [27]. RQA has previously been used in developing and improving health interventions and has shown to be helpful in increasing the relevancy and efficiency of data collection and analysis [13, 28].

For each participant, the first author of this paper created a summary page outlining various domains of interest related to the research questions, such as points of frustration and satisfaction when designing the poster. This page includes important quotes or codes from semi-structured interviews, which gives the researcher insights into potential pain points and ways of addressing them in practice. The content of summary pages for all participants were then populated in an Excel sheet, and matrix analysis was performed to find consistencies and develop recommendations for improving graphic design tools as related to templates.