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# Reflective Journaling: A Theoretical Model and Digital Prototype for Developing Resilience and Creativity

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**Abstract.** Reflection is commonly discussed as a tool for personal and professional development that is becoming increasingly important in today's global and digital world. In this paper, we propose a model that suggests ways in which reflection, in the form of Reflective Journaling, can support the development of creativity and resilience, which are needed to enable individuals to function effectively in a fast-changing environment. In addition, the model proposes ways in which external support and progress monitoring can be used in conjunction with skills in adaptive resilience and structured creativity, to support the maintenance of reflective journaling as a habit, in the longer term, thus creating virtuous cycles of skills and behaviours that can reinforce each other. Based on our model, and additional user research, we describe the design of a first digital prototype that aims to support the use of Reflective Journaling and to develop creativity and resilience through suggested mechanisms. Initial evaluations of our prototype are positive. It has been well-received by early test users, and has the potential to address all the connections defined. We therefore suggest that the theoretical model can be used to develop digital tools, such as the one included, to help those who wish to develop the habit of reflective journaling, and through that a range of other skills associated with resilience and creative thinking. We see this as a starting point for investigating this potential in more depth.

**Keywords:** Reflective Journaling, Learning, Digital Prototype, Creativity, Resilience, Emerging Technologies.

## 1 Introduction

We are increasingly finding ourselves overwhelmed and under-equipped to deal with global and digital disruption, where data travels fast, in bulk, and in every direction [30]. An important component of the lifelong learning that may help us to manage this situation, by learning how to adapt to each new circumstance in which we find ourselves, is reflection, or reflective practice.

Reflective practice is a crucial activity for learning from experience, and adapting to new circumstances [2]. Its most popular form is Reflective Journaling, which we define as a structured writing process with the purposes of acquiring a set of abilities and skills;

thinking in a critical inquisitive way; and solving problems within a professional context. Reflective practice through journaling, also known as Reflective Journaling, allows us to externalize important thoughts and feelings in academic, personal, and professional contexts [21, 33]. Unfortunately, while the benefits of journaling are noteworthy, O’Connell and Dymont [32] remind us that striking issues and challenges remain, not least in understanding how best to employ Reflective Journaling to support learning in a range of different contexts.

In this paper, we first present the results of a literature review that illustrate the links between Reflective Journaling, creativity and resilience, to better understand each of the concepts, and what may be needed to build strong habits, and monitor ongoing progress in each area. The links are shown in a model, as a series of virtuous cycles, in which Reflective Journaling supports the development of creativity and resilience, and vice-versa. This is important, since both creative thinking i.e. the development of original and effective solutions, and resilience, i.e. the ability to recover quickly from encountered difficulties are also key to helping us overcome new challenges and think of new ways forward in today’s uncertain and ever-changing circumstances [24, 37].

Based on our model, and some additional user research, we then describe the design of a first digital prototype to help reflective practitioners develop their creativity, resilience and reflective journaling habits through mechanisms suggested by our model. This prototype is digital to exploit the advantages of e-learning in enhancing self-monitoring skills and supplying online support. Initial evaluations of our prototype are positive, and we end with some discussion and suggestions for further work.

## 2 Theoretical Model

Reflection as a learning method was first introduced with Gregory Bateson’s levels of learning in 1972 [35]. However, better known is the concept of single and double loop learning by Argyris and Schön from 1978, which achieved great relevance in organisational learning and evolved into Schön’s reflection in and on-action model [31].

Reflection is a common approach to engaging in structured, self-directed learning and integrates theory with real world practice, due to the ease with which it can be implemented, the potential depth of feedback it provides, and the variety of structures that can be used to support it [31, 36, 38]. Reflection in the context of practice, reflective practice, originated in the professions of nursing, but has broadened across many industries over the years [10]. There is little consensus on a definition for reflective practice. Moon [31] listed some of them, which define reflection as a: set of abilities and skills [6], critical thinking process [36, 38], state of mind [8, 35], problem solving process [7, 16, 25], intuition and cognition trait [26], behaviour pattern [41], practice within professional context [22], or a maturation process [15].

Reflective practice can be exercised in an infinite number of ways as long as individuals can learn from their personal experiences and theory [4]. However, the most popular form is journaling, which allows to display thoughts and feelings of the academic and professional pursuits [21, 27]. For the purpose of this paper, reflective practice through journaling, or Reflective Journaling, is defined as a combination of the

above: a structured writing process to acquire a set of abilities, skills, and wisdom; think in a critical inquisitive way; and solve problems within a professional context.

Below we introduce each component of our model of Reflective Journaling based on this definition.

## 2.1 Reflective Journaling and Adaptive Resilience

An appropriate level of self-doubt allows individuals to acquire a stronger mindset – to be more resilient – while simultaneously becoming more flexible and sensitive – or more adaptable. De Haan [9] refers to this process as becoming both thicker and thinner skinned, or having both backbone and heart. To face adversity, practitioners must develop their resilience, and to retain a beginner’s openness, they must develop their flexibility [6]. So far, little research has focused on resilience in the workplace: in other areas of study, sleep, exercise, and diet have been identified as health factors that help build resilience [24]. In the same way, Reflective Journaling can be seen as a healthy habit, that can contribute to acquiring resilience.

On the other hand, too little self-criticism can hinder our learning abilities by mistakenly focusing on the external environment instead of ourselves [2]. Freire [12] defines this negative perception of commitment to critical reflection as the “banking model” of education. Individuals need to constantly work on their weaknesses by staying open to feedback, however uncomfortable it may be, and Reflective Journaling can provide a mechanism for doing this [11].

Skinner [39] pioneered one of the first models to understand patterns of behaviour and broke the process into three steps: antecedent, behaviour, and consequence. Many models of reflection are based on this structure and aim to help individuals focus on their own actions and behaviours, instead of external factors, by reframing attitudes to re-evaluate events. In this context, Reflective Journaling can help to build an open attitude to understand and evaluate how behaviours shape triggers into outcomes.

In summary, an appropriate level of self-doubt, developed through Reflective Journaling, allows individuals to acquire a stronger mindset – to be more resilient – while simultaneously becoming more sensitive and flexible – or more adaptable (Fig. 1).

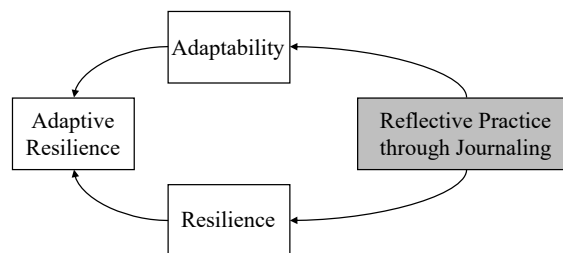


Fig. 1. Reflective Journaling, Resilience and Adaptability

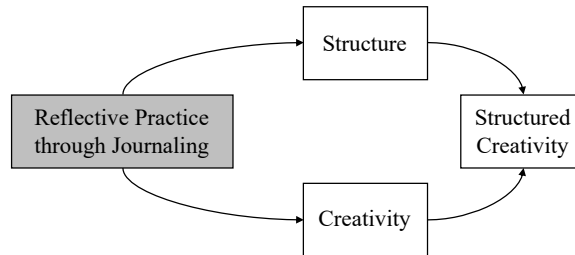
## 2.2 Reflective Journaling and Structured Creativity

To achieve optimal learning for long periods, reflective practitioners must be organised, and to maintain interest and motivation, they must apply variation to their practice [28].

Multiple studies demonstrate the obvious lifestyle improvements of implementing orderly activities and behaviours, such as self-control or positive discipline [3]. In a similar way, there are many ways in which a process of reflection can be structured: for example, there are many levels of reflection that can be engaged in, from basic observation, to integrating theory with practice, to connecting experiences [23]. Many authors have observed that the majority of reflective practitioners mainly describe events without reflecting on them [32]. However, Reflective Journaling can be used to develop critical, reasoned and rational thinking [30, 38], thereby enhancing structured thought processes that help improve our healthy behaviours.

Additionally, Reflective Journaling provides a space to promote creativity and provides individuals with the opportunity for self-expression [17, 18], and the variety of forms in which reflection can be practiced allows individuals to express themselves in their own way [32].

Thus, an appropriate level of structured thinking, developed through Reflective Journaling, allows individuals to acquire an organised mindset – to be more structured – while simultaneously becoming more self-expressive – or more creative (Fig. 2).



**Fig. 2.** Reflective Journaling, Structure and Creativity

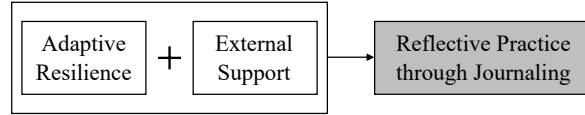
### 2.3 Reflective Journaling and External Support

Integrating Reflective Practice in a routine requires an important behaviour change in the sense that reflective practitioners must learn to maintain their practice over time [32]. Reflective practitioners should be aware that relapses, or periods when little reflection is undertaken, are unavoidable, and should therefore, prepare themselves with appropriate tools, or support, to bounce back into practice [19].

This support can take several forms, such as training or financial incentives [32]. It may also take the form of emotional support from a social network of the kind that is known to contribute to an individual's personal resilience, if, for example, an individual is willing to share entries in their reflective journal with others.

Reflective Journaling is a very personal activity and many authors have raised issues in regard to sharing reflective journal entries with others, considering ethics and psychological safety and the effects on the quality of the reflection [14]. If reflection is to be shared, the risks it involves must be addressed: accepting feedback from others and giving deep reflections.

There is still much to be learnt about how best to use external support as part of a reflective journaling process, but certainly a combination of adaptive resilience and external support can be helpful in generating momentum in the reflective journaling process (Fig. 3).



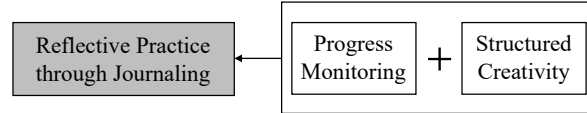
**Fig. 3.** Adaptive Resilience and External Support facilitate Reflective Journaling

## 2.4 Reflective Journaling and Progress Monitoring

As mentioned above, a certain level of originality and novelty is necessary to maintain motivation in learning [28]. Therefore, practitioners should use diverse structured approaches to Reflective Practice, such as remix exercises [28], creativity triggers [1], serious play [40], or Socratic questioning [13].

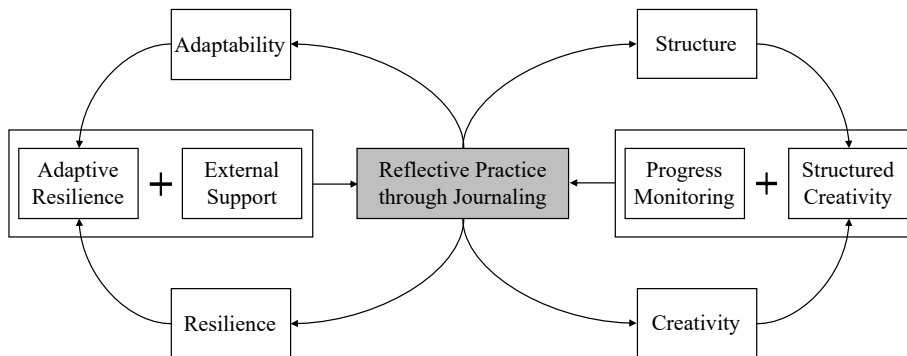
Additionally, Edmondson and Saxber [11] state that students should think about learning and development as an investment, asking questions and setting frequent follow-ups and key performance indicators to monitor progress. Measuring progress is key in certain activities, such as sports performance [19], and we argue that the same may well be true for Reflective Journaling.

Thus, a combination of structured creativity and progress monitoring can support the practice of Reflective Journaling in the long-term (Fig. 4).



**Fig. 4.** Structured Creativity and Progress Monitoring enhance Reflective Journaling

Bringing together all of the above, the developed theoretical model (Fig. 5) shows the virtuous cycles, through which Reflective Journaling supports the development of creativity and resilience, and vice-versa.



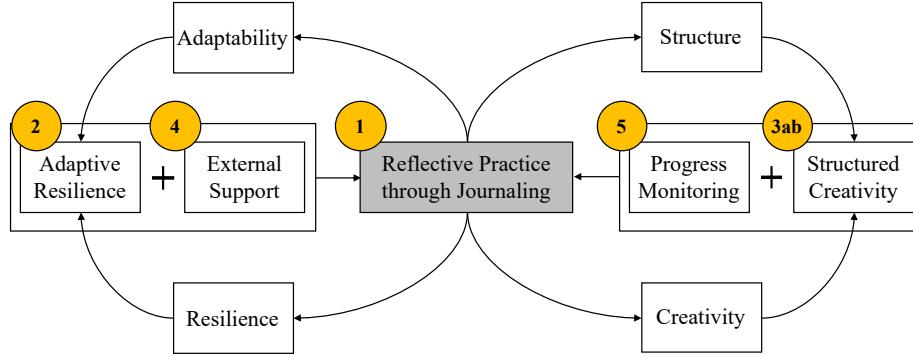
**Fig. 5.** Theoretical model of Reflective Practice through Journaling

This model can serve as a basis for developing applications that use emerging technologies with the aim of supporting lifelong learning through Reflective Journaling, as described in the following section.

### 3 Digital Prototype

To provide some insight into the utility of our model, a digital prototype was designed, developed, and evaluated. Inspired by applications used for habit building in other areas, such as exercise or meditation, and by other attempts to use mobile technologies to support reflective learning in the workplace [34], we first assumed that our prototype should include features corresponding to each of the concepts in the model of reflective practice discussed above, as shown in Fig. 6.

Features proposed on this basis included support for adaptive resilience through plan setting (2), support for creative structure through reflection models (3ab), provision of external support through a social club (4), and progress monitoring through statistics and insights (5).



**Fig. 6.** Links between the Theoretical model of Reflective Practice through Journaling and the Five Main Screens on the Prototype

The prototype was further designed by following a human-centred design approach, as characterised by Maguire [29]. This approach involves 4 main stages: understanding and specifying the context of use, specifying the user requirements, producing design solutions and evaluating designs against requirements. The previous section has sketched out the context in which a digital tool for reflection would be used. In this section, we describe work done to identify user requirements for such a tool, and then design and evaluate a first prototype.

#### 3.1 User Requirements

To better understand user requirements for a digital reflection tool that could support the various elements of our model, we began by surveying thirty-eight participants to



analyse their journaling preferences and strategies. Participants included master's students with previous professional experience, researchers, and professors (Males=17, Females=20, Prefer not say=1, Majority aged 26-35, Participant ages ranging from 26-35 to 46-55).

The survey was broadcasted through social media, shared with researchers through email, and included in email newsletters, such as the one circulated by the Boosting Resilience project [5]. All participants signed consent forms before completing the survey. The survey included four screening questions to ensure the participants were fit for the study as current reflective practitioners.

The survey was used to understand current reflective practitioner's preferences including: journaling frequency (daily, almost daily, weekly, almost weekly, monthly, almost monthly, or barely), seniority (a few months, 6 months, 1 year, 2 years, or more than 5 years), writing prompts or guided questions (Structured Creativity), and shared reflections with trustees or community of friends (External Support). The responses were analysed using statistical analyses, extracts of which are shown below.

From the pool of thirty-eight respondents to the survey, seven participants (Males = 4, Females = 3, Majority aged 26-35, Participant ages ranging from 26-35 to Over 66) that practiced Reflective Journaling and showed some level of dissatisfaction with at least one aspect of their practice were selected to understand their preferences in more depth using semi-structured interviews to allow unrestricted responses within the required questions.

Interview participants included four beginners and three senior practitioners. The choice of beginners for the interviews was motivated by our interest in observing a habit less built, while the choice of senior practitioners was motivated by our interest in the use of writing prompts and writing structure variation.

Three participants were interviewed in-person and four via Skype. All participants signed consent forms and agreed to being recorded. In-person interviews were voice recorded with the smartphone Record application and video interviews, performed through Skype or Google Hangouts, were screen recorded using QuickTime Player. The interviews had five main sections and lasted about 30 minutes: thoughts on key aspects to practice reflective journaling, preferred format and style, use of progress evaluations in their practice, and preference in using prompted questions or reflective models to journal.

Interviews were used to further understand the more personal elements of the model, which would have been difficult to explore through questions in the survey: the use of plans in reflection for self-evaluation, Adaptive Resilience, (for example, by asking "Is there anything you currently do to keep track of your personal evolution in reflective journaling? How is this working for you?") and use of goal setting and personal evolution, Progress Monitoring, (for example, by asking "It is my understanding that you have not used pre-filled journals before, why is this?"). The responses were transcribed and analysed with a thematic analysis.

The findings are examined below.

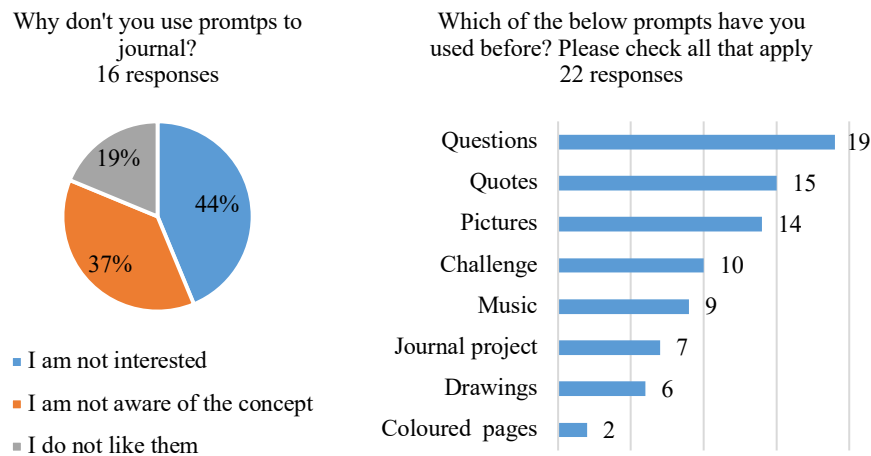
**Adaptive Resilience.** Regarding the development of a healthy reflective journaling habit to support resilience, all interviewees agreed that making time to journal and having a journaling routine is key. Participant 1 (P1) stated: “I struggle to keep it going on a regular basis”. The minimum viable product, required by all, is the ability to set journaling reminders and record activities to develop a journaling habit.

Participants also had different views on goal setting. P2 stated: “I’ve grown up in a world of SMART goal setting in business and while this applies to my career, I am not interested in applying it to journaling”, while P6 showed high interest in applying goals and development planning to their practice, saying: “I personally love personal development apps of any kind”. Given the variety of preferences among the participants, setting of reminders and goals was optional in our prototype.

**Structured Creativity.** Regarding structured creativity, 58% of survey respondents said that they already used prompts to structure their journaling. Favourite prompts were questions, quotes and pictures, with the most common sources of prompts being cited as a participant’s own notes, online searches and books. 42% of the participants had never used prompts to journal.

Of these, the most common reasons for lack of prompt usage were lack of interest (44%) or lack of awareness (37%) (Fig. 7). Additionally, some interviewees had said they found the use of prompts restrictive, P3 stated: “I would find a pre-formatted journal restrictive but I’m sure other people would like that extra layer”.

In our prototype, we therefore offered practitioners the opportunity to search for prompts of different forms (visual, audio or video), but did not mandate their use.



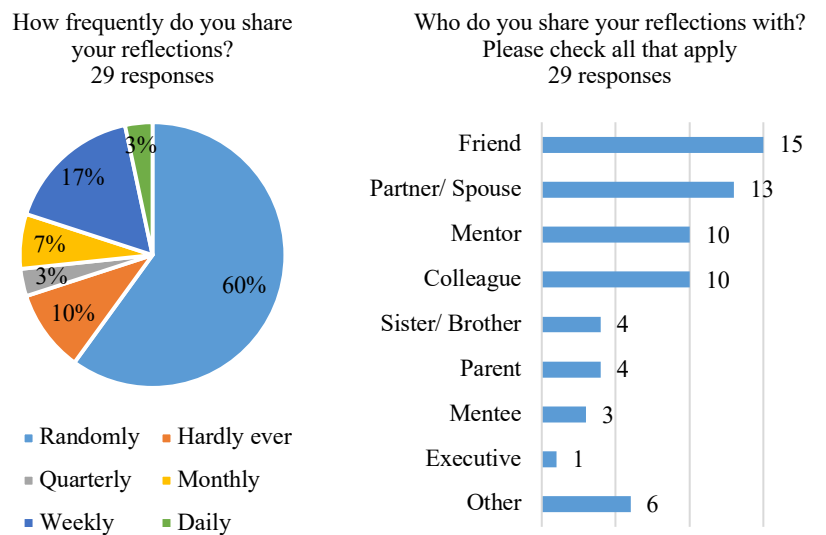
**Fig. 7.** Survey responses regarding Structured Creativity

**External Support.** The survey suggested that although most people (74%) had attended a workshop or programme on reflective learning, not so many (58%) had received feedback on shared reflections, and 21% of respondents had not shared their

reflections at all. Those who did share reflections, would share them with a friend, a partner or spouse, a colleague or a teacher/ mentor (Fig. 8).

Participants had very different perspectives on their journaling preferences regarding a potential community with which to share reflections. P5, for example, was nervous of sharing their reflections, saying: “when I journal, with real unfiltered comments that could be not politically correct and maybe very exposed”; In P6’s view, however: “Reflective responses as feedback would make a lot more sense because it’s actually engaging rather than simply saying your point of view is awesome or maybe not that good”.

In our prototype, we therefore implemented use of an optional closed community, for people who wanted to share and receive feedback on their reflections, which enabled practitioners to share or not share any individual reflection.



**Fig. 8.** Survey responses regarding External Support

**Progress Monitoring.** While the literature suggests that monitoring of progress is important to maintain practice over time, none of the interviewed reflective practitioners actually applied any sort of progress monitoring or showed interest when proposed, suggesting that users may be wary of this. It was therefore decided that this should only be implemented in the prototype as a background feature that participants could access if they wished to.

### 3.2 Prototype Design and Evaluation

Based on the above, an initial prototype was designed to serve as a mock-up to discuss the proposed system with users. The prototype was developed with Indigo Studio [20], a wireframe service that supports interaction design prototyping.

A controlled evaluation was carried out, working closely with two participants (P1 and P6) from the initial user research interviews to evaluate how successful they were in using the system (Male=1, Female=1, Ages 26-35). Participants were chosen by their availability to test the prototype in an in-person study.

The Indigo platform offered a usability test feature that worked perfectly for the evaluation purpose. However, any modifications to the prototype would not be updated live on the usability test and, therefore, this feature was discarded. However, its design inspired the structure for feedback collection and the tasks were introduced by the researcher manually, using the Wizard of Oz protocol [29]. This allowed think-aloud interaction with the prototype to be observed and to guide participants through emerging interactions. The test included a structured set of activities with each of the prototype's main features, allowing consistent forms of data generation and researcher-participant interactions.

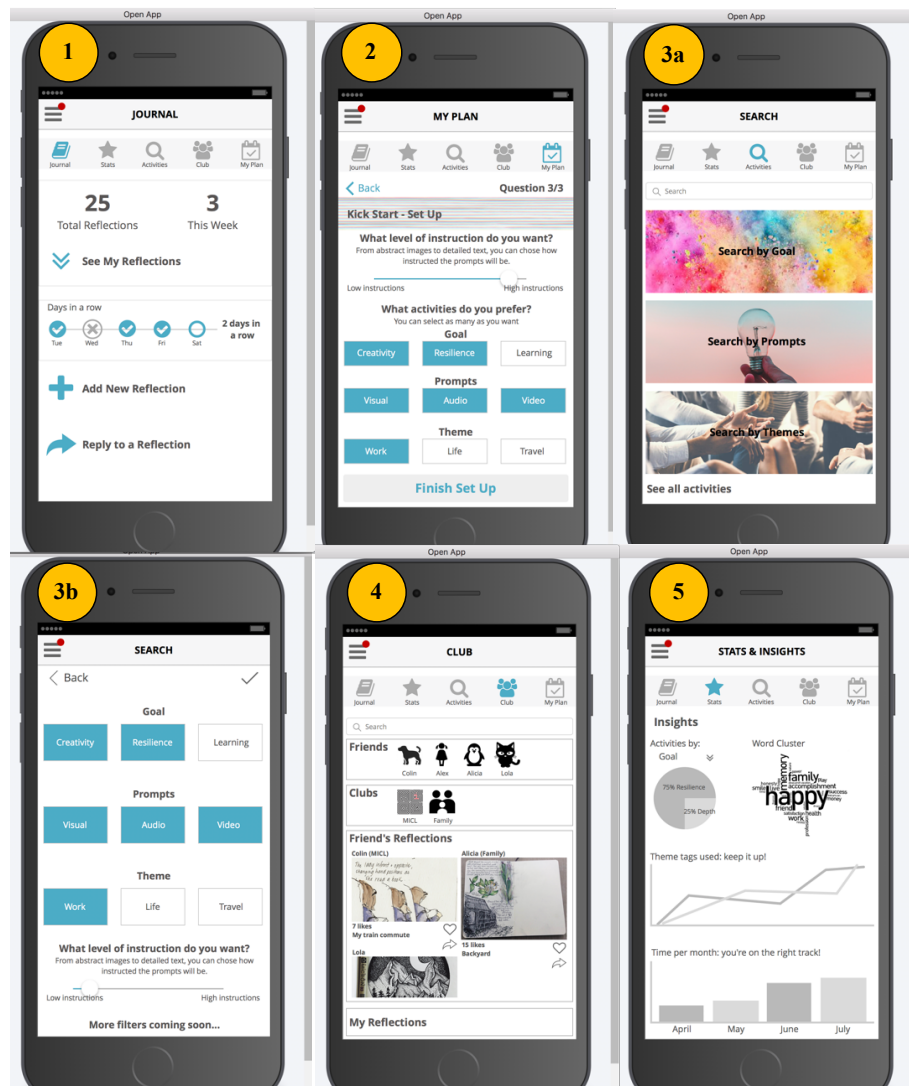
The tasks performed by the two users included: 1) upload a reflection piece, 2) check a reflective response from a friend, 3) upload a reflective response to a friend, 4) review activity progress and recommendations, and 5) create a journaling plan with a set of preferences.

The variables tested were: efficiency, measured as the time it took to complete each task; effectiveness, measured as the number of participants who completed the task successfully, struggled with certain steps, or got lost in the task; and satisfaction, assessed based on the feedback compiled through the think-aloud protocol [51] and post-experience interviews on the user's favourite features to evaluate their satisfaction. Each research-participant session lasted approximately 10 minutes in total, after which, a post-study open discussion was carried out. This unstructured talk allowed the users to express their overall experience and provide us with critical feedback on our design and further design opportunities.

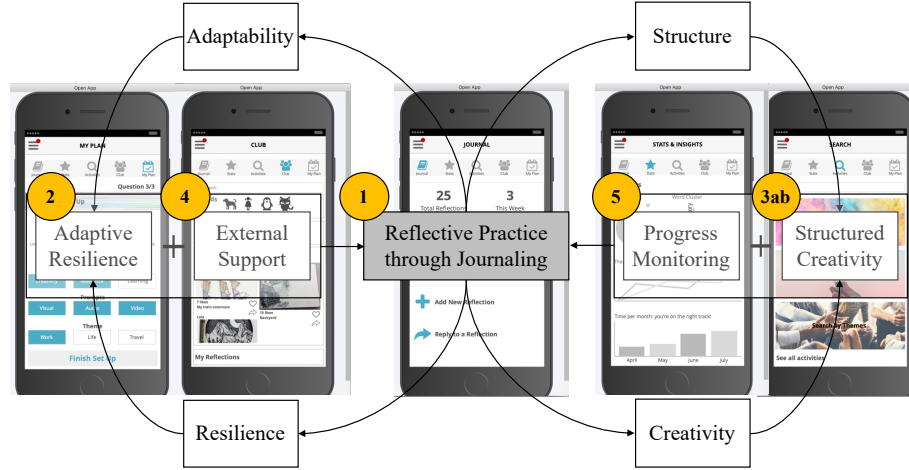
From these insights, a set of changes were prioritized and applied onto a second, and third version of the prototype. The final version of the prototype had five sections (Figure 7) that linked to each of the components of the theoretical model (Fig. 9, Fig. 10):

1. Journal (Main screen): allowed practitioners to record activities, log reflections, and reply to others' reflections.
2. My Plan (Adaptive Resilience): allowed users to set journaling goals and create journaling plans based on a series of preferences, including their main goal, experience, level of instruction, and activity preference.
3. Activities (Structured Creativity): practitioners were able to search reflection models, articles and prompts by a series of filters, including goals (creativity, resilience, learning), prompts (visual, audio, video), and themes (work, life, travel). Additionally, users were able to filter with what level of detail they wished to receive the exercises: from very detailed to barely.

4. Club (External Support): practitioners were able to add community, read others' reflective pages and notes, and share their own journals and reflective responses.
5. Stats (Progress Monitoring): allowed users to view their journaling stats and insights using a series of simple charts and graphs.



**Fig. 9.** Five Main Screens in Prototype of a digital tool to support Reflective Practice through Journaling.



**Fig. 10.** Five Main Screens in Prototype within the Theoretical model of Reflective Practice through Journaling

With the final prototype version, additional interviews were carried out to set future expectations and design recommendations. Two coaches (Male=1, Female=1, Ages Over 66) were identified from the initial survey pool and recruited to gather feedback on the prototype and identify design improvements. Both participants signed consent forms and agreed to be recorded. The first participant was interviewed via phone and recorded through the laptop using Quick Time Player voice recording, the second was interviewed via Skype and was recorded using Quick Time Player screen recording. Similar to the user research interviews, the conversations were recorded and transcribed for thematic analysis.

These coaches were interviewed with a semi-structured approach for 20 minutes each, similarly to the previous interviews. Interviews had three sections: first, about their experience of using digital tools, helping students build Reflective Practice, the combination of digital and physical platforms, and the relationship between reflection, creativity and resilience. Second, their thoughts on the application of prompts, prefilled journals, and evolution tracking in Reflective Practice. Finally, their view on the developed solution and proposed features, gathering feedback for changes to be applied if it were to be used within teaching programmes, either within the prototype, as a follow-up tool, or both.

## 4 Discussion

### 4.1 Summary and integration with previous work

In this paper we have summarised a new theoretical model that characterizes important relationships between Reflective Practice through Journaling and the development of

adaptive resilience and structured creativity. This has been done with the aim of providing a theoretical basis for future design research on how emerging technologies can benefit lifelong learning and enable us to respond adaptively and creatively to ongoing volatility and uncertainty in our environment. Additionally, we have introduced a prototype digital tool to support this process, designed on the basis of our model and subsequent user research to serve as a starting point for future design research.

The surveys and interviews carried out as part of our user research confirmed the current flaws in Reflective Journaling: practitioners have trouble maintaining the practice for long periods of time, do not usually engage in deep levels of reflection, have a great aversion towards sharing their reflections, and do not plan, and much less monitor, their reflections.

The developed model and prototype aim to address these issues: the prototype provides reflective practitioners with models and structures that should help them engage in deeper and higher quality reflections, with a variety of sharing options regarding people, time, and format; with a plan generator to create goals and achievements; and with automated report analyses to monitor progress (Fig. 10).

## 4.2 Limitations of the current work

The data gathered is not sufficient to prove that a Reflective Journaling digital tool can help develop resilience and creativity. Efforts made to gather a more diverse sample of participants for this study met with limited success. Most of the participants belonged to the researchers' network and therefore had a similar educational background.

The survey results show an indicative perspective of 38 reflective practitioners. For the results of our research to be more accurate, more participants' perspectives would be needed to understand the apparently emerging trends better. However, although the results of our research are not sufficient for statistical purposes, they do offer a good basis for initial system development. Our prototype incorporated all identified user requirements and the final product was well-received, suggesting high desirability.

Based on inputs from users who evaluated our prototype, some later stage changes were noted, to perhaps be included in future versions of our prototype:

- Support the digital tool with a physical notebook with prompts, following P8's comment that: "Everybody does reflection both digital and analogue";
- Integrate computer learning and tracking to scan journal entries for progress monitoring, following P8's observation that: "The two main options are creating content digitally or create your content on paper. So, you scan it or photograph it and upload it";
- Sync with other apps, such as Facebook or Meetup, for community simplification, following P8's statement that: "the history of sharing platforms is that there will be popular platforms at any one point in time, but people always use a diversity of platforms".

### **4.3 Future work**

In more general terms, the “soft” skills that were the focus of this study were creativity and resilience. Further research could further explore the links between reflective journaling and each of these concepts, as well as considering links with other characteristics and skills required to thrive in the workplace, such as empathy or collaboration [18]. Regarding resilience, research could examine the effects of different levels of reflection, on resilience and professional development. Additionally, it could explore the diverse points of view on sharing reflections and receiving feedback.

Considering what is shared with others and what is received in exchange will provide insights to improve depth of reflection. Regarding creativity, research could analyse the unpopularity of prompts in Reflective Practice. It is crucial to understand if resistance originates in a specific prompt range or format, or if there is a natural resistance to using structure in Reflective Journaling. This could be carried out by examining the effects of different levels of structured reflection, from free writing to reflective models, on creativity and professional development.

## **5 Acknowledgements**

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