

The effect of a gamified goal-setting intervention on confidence in navigating problems and the interaction with depressive symptoms

Abstract

Digital interventions are employed in Depression research alternatively to in-person interventions due to their ability to overcome limitations of face-to-face approaches, like accessibility. Goal-setting is one such interventional activity made digital. Though digital goal-setting has been investigated, there is limited research on how levels of depressive symptoms can influence the effectiveness of such digital approaches, particularly in gamified formats. This study aims to transform a single goal-setting technique into a brief gamified intervention using a game-creation platform, Ren'py. The effect of a text-based versus gamified intervention on confidence in navigating problems will be measured through an online survey using a confidence rating scale. Additionally, participants' level of depressive symptoms will be measured using the CES-D 10, a self-report depression scale. Consistent with previous research, it is hypothesised that the gamified intervention will promote greater confidence than the text-based intervention. The study will also determine whether participants with varying levels of depression will equally benefit from the intervention. The results will showcase whether gamified forms of interventions can have an advantage over traditional text-based interventions in serving individuals with differing levels of depressive symptoms. It could create a platform for further research on the development of alternate goal-setting or confidence-building interventions utilising gamification, with their effectiveness compared between mild and severely depressed individuals.

Keywords: Intervention, Goal-Setting, Digital intervention, Gamification, Depressive Symptoms

Introduction

The use of digital interventions has risen due to their ability to tackle issues posed by face-to-face interventions like accessibility and stigma (Hollis et al., 2015). There is a growing body of literature on the same, consistently highlighting their positive influences on mental health outcomes (Richards et al., 2015). Gamified interventions are one form of digital interventions becoming increasingly relevant due to mobile and social media use (Kim, 2015). Past research finds benefits of gamified interventions on alleviating anxiety and depressive symptoms (Cheng & Ebrahimi, 2023; Aschentrup et al., 2024). Their effectiveness and high levels of engagement (Curland et al., 2025) can be owed to features such as rewards, badges, points, etc. (Kelders et al., 2018). Goal-setting gamified interventions are shown to be beneficial in promoting physical activity and self-regulated learning (Patel et al., 2021; Cortes & Carreño-Bolivar, 2024). Therefore, the current study aims to replicate past research on gamified goal-setting with a focus on boosting problem-solving confidence in individuals, a measure of efficacy of goal-setting (Bailey, 2017). Aligning with prior research, it is hypothesised that a gamified goal-setting intervention will promote significantly greater confidence in navigating problems than a non-gamified intervention.

There is, however, a lack of research on how characteristics of populations targeted by goal-setting interventions may influence their effectiveness. One such characteristic is the level of depressive symptoms. Depression is characterised by a sustained low mood and loss of pleasure in activities, whose severity may vary (Kennedy, 2008). A meta-analysis finds larger effects of gamified interventions in reducing depressive symptoms for non-clinical populations (Cheng & Ebrahimi, 2023) whereas others show larger effects for those severely depressed (Bower et al., 2013). Nevertheless, there is little research on whether gamification of goal-setting can be suitable for individuals with all levels of depressive symptom severity.

The current study will implement a brief goal-setting intervention that is either gamified or non-gamified via an online survey platform, Qualtrics, and measure problem-solving confidence upon the intervention. Self-report depressive symptoms will be measured. Through this design, the study will investigate the comparative effectiveness of a gamified versus non-gamified intervention on confidence ratings, and the relationship between intervention type and depressive levels.

Method

Participants

Participants were a volunteer sample of 52 adults from the public, recruited online through social media advertising. Data of participants who were under 18 or who requested data withdrawal were removed from the analysis. No demographic information was collected.

Design

The study was conducted on Qualtrics. Participants were placed in a between-subjects design and randomly allocated to one of two interventions - gamified or non-gamified – by Qualtrics. Intervention type and depression levels were the independent variables used, and confidence rating was the primary dependent variable.

Materials

A 'snapshot' intervention was implemented lasting around 15 minutes, consisting of a single goal-setting technique - this paradigm was intended to provide a preliminary idea on the influence of depressive levels on confidence and invite further research involving more large-scale interventions. Goal-setting was incorporated into the gamified and non-gamified interventions by reviewing goal-setting principles within the literature such as short-term and long-term goals (Yanamadala & Weiss, 2022). The gamified intervention (see Appendix A) contained features characteristic of similar gamified interventions like badges, interactive

quizzes, and the use of virtual guides (Cheng & Ebrahimi, 2023). The non-gamified intervention (see Appendix B) contained the same content presented through text and bullet points without any gamified elements - similar to a text-based guide (Estrapala, 2019).

The CES-D 10 item depression scale was used to measure participants' depressive levels (Andresen et al., 1994), which showed good internal consistency ($\alpha = 0.80$). Finally, a 10-point confidence rating scale was provided to participants to report their confidence in navigating problems by using the goal-setting technique from the intervention - separate from global problem-solving confidence (see Appendix C).

Procedure

Participants were first randomly exposed to one of two goal-setting interventions and then provided the confidence rating scale to measure their confidence in navigating problems. Lastly, they were given the CES-D scale to report their level of depressive symptoms in the past week.

Results

A multiple regression analysis was conducted to predict confidence ratings from depression levels and intervention type. Together, the variables explained 16.9% of the variance in confidence ratings, which was significant, $F(2,49) = 4.99$, $p = .011$.

Table 1

Regression coefficients and variance in confidence ratings explained by variables

	Coefficient	<i>t</i>	<i>p</i>	% Variance
Depression Level	-0.38	-2.94	.005	14.7
Intervention Type (Gamified = 1, Non-Gamified = 0)	0.11	0.88	.384	1.3

Note. % Variance is the percentage variance uniquely explained by the predictor variable.

Regression coefficients are standardised.

As seen in Table 1, depression levels explained a significant amount of variance in confidence ratings overall. Further analyses revealed this pattern within both gamified [$t(48) = -2.06, p = .045$] and non-gamified conditions [$t(48) = -2.17, p = .035$]. However, the interaction between depression level and intervention type was not significant, $t(48) = -0.63, p = .534$.

Discussion

The study utilised a valid intervention based on goal-setting principles (Yanamadala & Weiss, 2022) and incorporated features of similar gamified mental health interventions within the gamified intervention (Cheng & Ebrahimi, 2023). However, it could be worth analysing potential reasons, including limitations of the study design, that may have led to a non-significant effect of the gamified intervention on confidence and a non-significant interaction between depression levels and confidence.

The study measured participants' confidence in applying a single goal-setting technique, rather than global confidence in goal-setting. However, this form of confidence may still involve some level of competence or training in it over a longer period, or even real-world experience (ChatGPT, 2026) (Moulier et al., 2019; Ghahfarokhi et al., 2015). Therefore, a brief intervention involving hypothetical problem-solving may not be beneficial regardless of intervention format.

Alternatively, features of the gamified intervention may have undermined confidence ratings. The gamified intervention may not have included game elements most crucial for aiding confidence through the mechanisms of goal-setting. For example, benefits of gamified goal-setting in past studies could be due to the presence of features such as earning scores (Nuijten et al., 2022) or tracking progress as goals are set or achieved (Patel et al., 2021) - which the

current intervention lacked. Therefore, further research could involve longer interventions and identification of game features more appropriate to goal-setting processes.

The findings showcased that depression levels significantly predicted variance in confidence ratings overall, aligning with research suggesting that depression influences confidence in navigating situations (Zhang et al., 2025). However, there was no differential ability of either intervention to buffer the influence of depressive levels on confidence ratings - depression levels had a greater impact on confidence levels above and beyond the type of intervention used. Other than the intervention brevity or choice of gamification elements, there may have been certain socio-emotional factors not addressed within the intervention. For example, assisting with emotional regulation before goal-setting is applied (Compare et al., 2014) may dampen the influence of depression. Nonetheless, depression is a stable state (Hinz et al., 2011) possibly, whose effects cannot be quickly neutralised. Further research is needed on how long a similar intervention must be or what features can be incorporated in order to buffer the effect of trait depression on intervention efficacy.

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Appendix A

Gamified Intervention Sample Screens

Figure A1

Virtual Guide



Figure A2

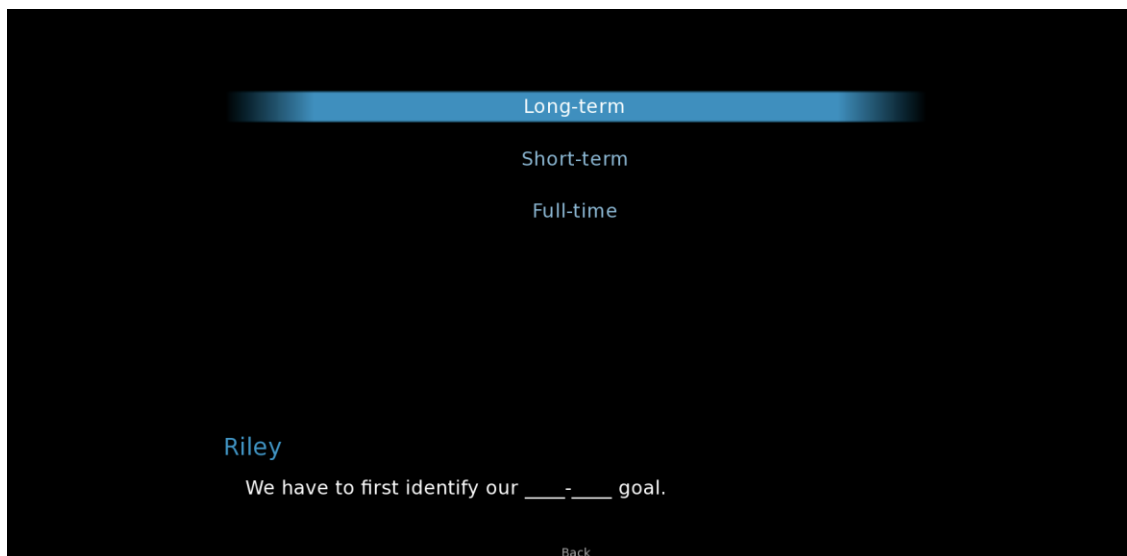
Quests to Earn Badges (Reward)





Figure A3

Quizzes



Appendix B

Non-Gamified Intervention Sample Text

Welcome to Goal-Setting 101. In our lives, we come across situations that are not always simple to deal with. Here, you'll learn how to set goals to navigate different situations.

Let's take an example of Emma, a university student:

Emma is a student at university. She tries to eat food at regular times but cannot because of her busy schedule.

How can Emma use goal-setting to solve her problem?

1. She needs to first identify her **long-term** goal, or the final result she wants to achieve:

Her long-term goal is to eat at regular times even though she is busy.

2. Then, she has to come up with **sub-goals**, or steps to achieve this long-term goal.

Appendix C

Confidence Rating Scale

Do you feel confident that you can navigate problems in your life using the goal-setting technique presented to you? Rate your confidence on a scale from 1–10, with 1 being 'not confident at all' and 10 being 'very confident'.

0 1 2 3 4 5 6 7 8 9 10

Confidence

