This is the pre-peer-reviewed version of the following article: Fleming, T., Poppelaars, M. and Thabrew, H. (2023), The role of gamification in digital mental health. World Psychiatry, 22: 46-47. https://doi.org/10.1002/wps.21041, **which has been published in final form at https://onlinelibrary.wiley.com/doi/10.1002/wps.21041**

The role of gamification in digital mental health

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In the face of high unmet mental health needs and overburdened mental health systems, scalable approaches to increase use of evidence-based interventions are essential. Smart phone apps, e-therapies and other digital interventions offer promise in this regard. Digital interventions can be effective for a range of clinical disorders. These tools, particularly those that can be used without clinical support, can have enormous reach[1]. However, early optimism that digital interventions could be placed online, optimally utilised by those who need them and thereby improve population mental health has not been realised. Both the uptake of tools and sustained engagement with them have often been disappointing[1, 2]. More sophisticated efforts, in both *systems around* digital interventions and *features within* the digital tools themselves are required. Promising areas in systems around the tools include improved public messaging, clinician training, and embedding tools within clinical, educational or workplace settings. In terms of improving digital interventions themselves, there is potential in further increasing appeal (so people are willing to try the tools), improving usability (the major reason for early disengagement in apps) and enhancing 'stickiness'. By 'stickiness', we mean the degree to which users' adherence or engagement is supported by aspects of the intervention itself, rather than relying on their personal effort or external support. A key opportunity for both appeal and stickiness is increased use of gamification.

Gamification refers to the use of features from gaming, in contexts that are not games as such[3, 4]. Commonly used features include small achievable challenges (often building toward larger objectives), rapid feedback or rewards, and personalisation. Other features include unpredictability, increasing complexity, narrative, themes or imaginary settings, opportunities to choose and explore, and social interaction or competition[3, 4]. Gamification can allow users to test and rehearse skills in a safe yet responsive environment, offer extrinsic motivation, and may support intrinsic motivation (e.g. by noticing progress) [3]. Gamification often includes elements of user control, supporting a sense of autonomy [5], and may facilitate a sense of flow or immersion, important for enjoyment and sustained attention[3]. From step counters to supermarket loyalty schemes, gamification has burgeoned with the development of digital technologies.

Within the field of digital psychiatry, gamification offers three key areas of potential[3]. First, an appeal or attractiveness potential. Games are among the most popular forms of entertainment globally, reaching a hugely diverse audience. Far from the popular stereotype of gaming as a teenage male phenomenon, the average gamer is over 30 years old and 45% are female. A gamified intervention may be more appealing to some users than traditional models due to fun elements. Gamification might also reduce barriers to therapy such as stigma and help-negation[4]. Second,

gamification may offer potential for alternative mechanisms of change to those emphasised in more traditional approaches. For example, facilitating the visualisation of complex ideas, such as negative thoughts, and allowing manipulation of such images. Third, gamification offers an engagement potential, keeping users engaged in the tool longer than they otherwise might be, via the use of rewards, fun and other features, meaning users get a higher 'dose' of the intervention[3].

While gamification has been used in diverse areas, there is little evidence to date in psychiatry. A recent meta-analysis did not identify higher adherence or impact for gamified compared to non-gamified apps for depression[6] and there is a lack of recent evaluative reviews[4]. Reviews are hampered by heterogeneity and lack of specificity about gamification processes and by time delays between rapidly changing digital approaches and publication of trials. However, studies have reported that gamified mental health options are appealing for some users. Young adults with internalising symptoms selected a game promoted as a mental health intervention over an entertainment game[7] and in a community sample, many adolescents considered gamified interventions appealing[8]. That said, the latter study reported polarised views: some adolescents advised that gamification might be trivialising of their distress and highlighted the need for choice in digital approaches[8].

In the face of interest but limited evaluative literature, it is useful to consider illustrative examples. Gamification techniques have been widely used in mental health tools. Here we outline two contrasting examples: Headspace, one of the most popular mental wellbeing apps, and SPARX, a cognitive behaviour therapy (CBT) based treatment for adolescent depression.

Headspace is a meditation app boasting tens of millions of downloads. While it does not look like a game, Headspace uses multiple gamification features[5]. Content comprises short chunks that build into larger achievements; targets and progress are shown clearly; and 'badges' for activities are immediate. Headspace uses other features common to gamification, including a colourful aesthetic, optional notifications, minimal text, animations and social influence. In an often underrecognized but important feature of gamification, it provides extensive yet simple choices and opportunities for user control[5]. While there are few trials of Headspace for psychiatric disorders, it is one of the most downloaded mental wellbeing apps in the world[2] and has among the highest retention rates of these[8], demonstrating both phenomenal appeal and good 'stickiness'. There are no direct comparisons to consider how much these are due to gamification, and Headspace also utilises other features such as a large promotions budget. However, gamification features are integral in this app.

In contrast, SPARX is an unguided computerised CBT program offered in a game-like format. It makes extensive use of metaphor and story to allow users to discover and rehearse therapeutic content in a playful manner, and then reflect on skills and their use in real life with an animated virtual therapist. Gamification features include narrative, imaginary settings, opportunities to explore, puzzles, reward 'mini-games' and playful quizzes. SPARX was not inferior to treatment-as-usual for depressive symptoms in a large trial[9]. Retention rates were good in studies and adolescents reported that game features were helpful for engagement[9]. However, once implemented outside of research settings in New Zealand, retention has been lower, and adolescents have commented on the need for updates in line with expectations of commercial games[9]. Interestingly, while New Zealand adolescents advised that SPARX is suitable for younger teens, a Japanese version of SPARX has been most widely used by adult men[9].

These examples illustrate that far from being only for the young, or for non-clinical use, gamified interventions can engage adults and offer evidence-based treatment. As well as these examples, there are many other instances of gamification in digital mental health[3, 4, 7], however the literature is at an early stage. It would be premature to claim major impact or failure for gamification in psychiatry. There are also specific challenges, including high expectations of gaming in accordance with the high budgets involved in many computer games, and, on the other hand, expectations of

non-playful interventions for serious needs. While we have mentioned that gamification might support motivation, external rewards can undermine internal motivation if not used carefully[4]. Future research should explore these questions and should examine the impact of specific gamification features, make stronger use of gamification theory, and consider audience segmentation and the importance of user preferences[3, 4, 9].

It is critical to expand scalable approaches to improving mental health. Digital tools offer extraordinary potential for this. However, the appeal and stickiness of digital tools must be addressed. Gamification offers promise for increasing appeal and engagement and should be pursed alongside other opportunities.

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