





# “Money from the Queen”: Exploring Children’s Ideas for Monetization in Free-to-Play Mobile Games

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**Abstract.** Over 95% of mobile games found on the Android Play Store are free to download and play which typically means that income for the publishers is generated through monetization mechanisms included within the gameplay. It is already established that monetization within mobile games often makes use of deceptive design (sometimes called ‘dark design’) in relation to aspects such as advertising and game-related purchasing. The limited spending power of young people often means that children and teenagers play these ‘free’ games extensively and are therefore regularly experiencing in-game monetization attempts developed by adults to target adult players. Monetization typically plays a key role in gameplay and associated gameplay experience in free games. We asked young people (n = 62) aged 12–13 years how they thought developers should monetize free mobile games. Findings show that participants were able to suggest novel mechanisms for monetization, new monetization possibilities developers could consider, and ways in which the experience of monetization mechanisms for players could be improved. We hope this work can help prompt discussion around participatory approaches for monetization and focus attention on the user experience of monetization techniques within mobile games.

**Keywords:** Children · Adolescents · Teenagers · Mobile Games · Deceptive Design · Dark Design · Deceptive Design Patterns · Monetization

## 1 Introduction

Children and teenagers are prolific users of mobile phone and tablet devices along with the apps and games they provide access to. For example, in the UK, 97% of children aged 12–15 have their own mobile phone and 63% play games on their phones [1]. Due to the limited spending power of this demographic the games they play are often free-to-play i.e., with no upfront cost for downloading and installing. Regardless of spending power, data from the Android play store shows that over 96% of mobile apps (including games) are in fact free-to-play [2]. Clearly the cost of developing and marketing mobile games is substantial and, to generate revenue, monetization mechanisms are built into these ‘free’ games. Monetization within free mobile games appears to be very effective and despite

the extremely high proportion of free-to-play games revenue from the mobile games sector is forecast to exceed \$172 billion in 2023 [3]. Monetization can typically be divided into two distinct approaches, the first being where a user makes small payments (micro-transactions) with actual currency (for example, through purchasing a subscription or purchasing items within the game which may be through an intermediate currency), and the second being where the attention of the user is engaged in ways which generate income for the game publisher (referred to as the Attention Economy [4] and usually involving advertising). Monetization tactics deployed within mobile games are often categorised as deceptive design patterns in themselves or are enhanced using deceptive design. Deceptive design (sometimes called ‘dark design’ or referred to as ‘dark patterns’) is typically defined as an attempt to trick a user into action that that user would not normally choose to engage in [5]. A common tactic is the use of interstitial (full screen) adverts within the game, the efficacy of which may be ‘enhanced’ by deceptive design such as having an extremely small dismiss or skip button which, when the player tries and likely fails to tap it accurately enough, will inadvertently lead the player into visiting the content associated with the advert.

Whatever monetization strategy is employed by a game publisher, whether it contains deceptive design or not, this is unlikely to be a desirable or positive part of the gameplay experience for the player. This is because monetization strategies introduce an ‘annoyance’ [6, 7] which must either interrupt the game to engage the user’s attention (e.g., with advertising), or be annoying to such an extent that the user would be prepared to pay to remove it (e.g., subscribe to remove adverts). Crucially the monetization model and associated tactics are chosen by the developer; if the player wishes to engage with the game, they have little or no choice in how they participate in income generation for the publisher. Outside of mobile games other innovative mechanisms for monetization exist where contributors are given choices such as Crowdfunding, Pay What you Want (/Pay What you Can), Membership platforms (such as Patreon), and appeals for donations (e.g., as used by Wikipedia).

Within this work we sought to gather ideas from young people about how they thought ‘free’ apps should be paid for by asking directly for their ideas. The ideas collected were then thematically analysed to give four themes of Status Quo, Novel Mechanisms, Developer Possibilities, and Improving Experience. The contributions of this paper are twofold, firstly the findings show the potentially valuable insights young people can provide in participatory activities related to mobile game monetization, and secondly findings highlight areas for future work focused on the impact of monetization techniques within mobile games on the player experience. These issues are important due to the prevalence of mobile gaming among young people and pervasiveness of monetization in free-to-play mobile games.

## 2 Related Literature

While historically, mobile developers faced a choice between free or paid (or multiple) offerings [8], most mobile games are now free to download and play (termed ‘free-to-play’ or ‘freemium’) meaning that monetization mechanisms (to earn revenue for the developer) are built into the game. Commonly, monetization is achieved through

advertising using Ad (Advertising) Networks which provide APIs for developers to integrate into products to display adverts to users, for which they receive remuneration from the Ad Network. The appearance of the advert to the player is largely dependent on the Ad Network’s and developer’s choices but five basic types exist: Offerwall, Popup, Notification, Floating and Embedded [9]. Additionally, there are typically five different ways the remuneration to the developer is calculated which is also dependent on the Ad Network’s and developer’s choices:

- Cost Per Mile (CPM): Per 1000 views of the advert.
- Cost Per View (CPV): Per view of a video advert.
- Cost Per Click (CPC): Per click on the advert.
- Cost Per Install (CPI): Per download/install of the app/game being advertised.
- Cost Per Action (CPA): Per action a user carries out based on the advert.

As early as 2015, the use of Ad Networks was known to increase data usage, device energy consumption, and make mobile apps more annoying [10]. There is a growing body of work on deceptive design within the HCI research community focussing on adults which includes practitioner perspectives [11], ecommerce web sites [12], mobile apps [13], cookie consent banners [14, 15, 16], recognition and experience of deceptive design [17, 18], along with deceptive design within video stream services [19] and voice interfaces [20]. Very few examples currently exist which focus on monetization within games or mobile games specifically. Zagal et al. [21] were the first to identify and classify deceptive design patterns within games: “pattern[s] used intentionally by a game creator to cause negative experiences for players which are against their best interests and likely to happen without their consent”. While Zagal et al., do not reference advertising they do identify grinding (repetitive in-game tasks) as a “way of coercing the player into needlessly spending time in a game for the sole purpose of extending the game’s duration” which would expose the player to more advertising and increase revenue.

Zagal et al., also describe “Monetary Dark Patterns” as designs in which “players [are] being deceived into spending more money than they expected or anticipated”. This points to the potentially problematic use of microtransactions which is also highlighted King and Delfabbro’s explanation of predatory monetization: “purchasing systems that disguise or withhold the long-term cost of the activity until players are already financially and psychologically committed” [22]. Fitton and Read [7] explored deceptive design in free-to-play games with children and identified six separate types of Monetary deceptive design patterns specific to mobile games (Pay for Permanent Enhancements, Pay for Expendable Updates, Pay to Skip/Progress, Pay to Win, Subscriptions, Intermediate Currencies). In the same paper they also introduced the categories of ‘Disguised Ads’ and ‘Sneaky Ads’ (the example used in the introduction of adverts with extremely small dismiss or skip button aligns with this latter category). Another example of questionable monetization practices is the Loot Box [23] which is effectively a form of gambling which has been incorporated in many popular mobile and desktop games.

The experience of players who come across these designs has been studied with adult users, for example Zendle and Petrovskaya [24] who surveyed player’s experiences (mobile and desktop platforms) and found participants considered many of their monetary transactions within games “misleading, aggressive or unfair”. There is overlap

between the survey findings from [24] and the classifications within [21] and [7] such as grinding, pay to win and in-game currency.

Regularity bodies (such as Ofcom in the UK and FTC in the USA) along with policies provided to developers by App Stores should mitigate problematic use of monetization by developers, but existing literature would suggest these are not yet sufficiently effective [7, 23–25]. Presently it seems there are no compelling alternatives to the Free-to-Play monetization model in the mobile gaming context (unlike the more innovate approaches used in other popular technologies such as YouTube [26]). To-date only a small number of studies have focussed on deceptive design within the context of mobile games for younger users [7, 25], and no work we have found takes a participatory approach to identifying new or innovative monetization possibilities.

### 3 The Study

#### 3.1 Method

The data analysed in this study was part of a larger data set collected when two high school in the North-West of the UK visited our university to participate in research studies and STEM activities as part of a MESS (Mad Evaluation Session with Schoolchildren) Day session [27]. Within a MESS Day session, a group of pupils and teachers visit our university and circulate between different activities and research studies, each approximately 20 min in length, in small groups. All pupils participate in all activities and research studies on the day. Participant information and parental consent sheets were provided to the participating schools who dealt with distribution and collection of such consent; only pupils with consent confirmed attended. The participants were aged 12–13 years with 62 participants in total (23 male, 35 female, 4 chose not to disclose a gender). Pupils worked in small groups (typically pairs) to respond to questions about their experiences of mobile games by writing answers on Post-it notes and placing them on a large sheet of paper (1 sheet per group). This approach to collecting data is known to work with adolescents and has successfully been used previously [7]. In this paper we focus on answers to the question of “How should developers of free apps/games make money?”. Figure 1 shows a completed question sheet. A facilitator introduced and explained the activity and a class teacher was always present. The groups worked independently for approximately five minutes answering the question, all data was collected anonymously, and groups were told that they did not have to allow their data to be collected.

#### 3.2 Analysis

Thematic analysis was used to code the data using an inductive and semantic approach as we were most interested in understanding the raw ideas from the participants. Two coders familiarised themselves with the data by reading through the answers on the Post-it notes; the Post-it notes were then removed from the answer sheets and organised into initial codes which were labelled (and re-labelled) during the coding process. The coding was completed collaboratively, with both coders considering each Post-it note in turn. There was no disagreement when assigning codes, and only a single code was necessary

for each idea. In total, 98 Post-it notes/ideas were gathered from the answer sheets; of these, 14 were unclear/irrelevant and excluded from the analysis. Codes and associated examples from the data are shown in Table 1. The final stage of analysis involved both coders considering the codes and organising them into themes, this resulted in four themes which are discussed in the following section.

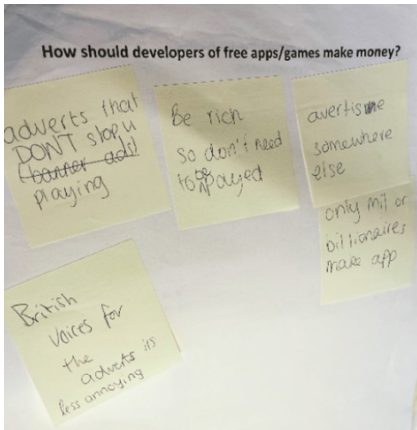


Fig. 1. Completed question sheet.

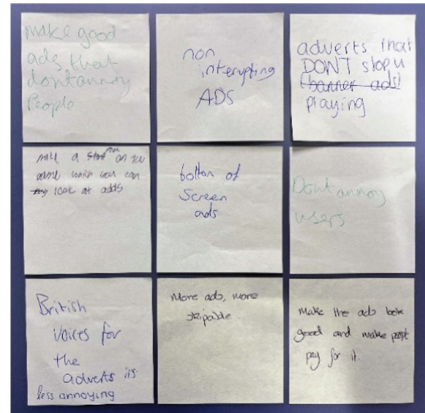


Fig. 2. Data from Improving Experience theme.

### 3.3 Results

The following subsections describe the four themes which emerged from the analysis and associated codes (from Table 1) within them.

**Status Quo Theme:** This theme included monetization techniques which are already widely used in free-to-play games. These included unspecific references to advertising (from the *In-Game Advertising* code), and references to in-game purchasing (from the *In-Game Purchases* code) which were either unspecific or mentioned in-game currency (typically ‘coins’). The third code subsumed into this category was *Player Pays*; this code primarily included references to paying for the game ‘up front’, which had three examples making it clear that the paid for version had no advertising. Also included in this category were two examples of ‘subscription’ which implied continual cost instead of initial cost. Interestingly the *Player Pays* code had the largest number of occurrences in the data (18) and the *Status Quo* theme overall accounted for 46% (45/98) of the total data. This may be because participants were already familiar with these examples and assume they are effective.

**Novel Mechanisms Theme:** This theme included funding mechanisms which do not yet exist and that can provide external sources of funding for developers of games. The first code in this theme, *App stores pay*, implies reversing the role of app store, where the app stores would pay for games to be included (we assume this would mean

that monetization within games would not be necessary) rather than app stores being vehicles for developers to distribute and sell their products to consumers. While this is an interesting idea is not clear how the money to pay the developers would be generated. The next code, *Popularity*, appears to be a variation on the previous theme where a mechanism is proposed to pay developers based on the number of downloads or users of a game. These two codes highlight the relatively sophisticated understandings of app stores that participants had, they had likely noticed the metrics (e.g., downloads, ratings etc.) provided on the user interfaces in the app stores, and realised that app stores are associated with large, and very financially successful, companies (Google and Apple) which could potentially remunerate developers somehow. The next code, *Philanthropy*, hinted primarily at wealthy ‘others’ who would be able to pay for mobile games so they would be free to players. In addition to charity events, data in this code also hinted that only very wealthy people should be developing games who, participants seem to assume, would not need additional income, and so would not include monetization (e.g., ‘Be Rich so don’t need to get paid’). The final code, *State Funding*, included examples which specified that the Government (or monarchy in the UK context) should pay the developers of mobile games, again our interpretation is that this would mean that monetization would not need to be included in games. This reasoning should perhaps seem logical to participants (children in the UK) as the Government provides them with free education and healthcare.

**Developer Possibilities Theme:** This theme contained ideas for possibilities that game developers could explore to generate income outside of traditional in-game monetization techniques. The first code within this theme, *Change Business Model*, suggested ideas not related to the mobile games specifically that would be potentially relevant to any business. The theme also included the code *Dark Income* which included ideas which hinted at changes to games which, while potentially illegal or unethical, could generate additional income for the developer. The code that aligned with the most data within this theme was *Other Advertising* which included ideas for advertising outside of mobile games which included ‘posters’, ‘email marketing’, ‘tv adverts’ and ‘celebrity promotions’. The participants in this case had potentially not fully understood the nuances of how advertising within games is used for monetization; as the coders took a semantic approach to analysis, we accepted the implied premise that advertising generates income and included it within this theme. The next code within this theme, *Sponsorship*, made unspecific references to ‘sponsorship’ and ‘get a sponsor’, we interpreted this to imply arrangements analogous to commercial sponsorship within sport teams, players, events etc. where the income from the sponsor would change the monetization mechanism used. Similar to the previous code, the participants perhaps did not fully consider that a sponsorship arrangement within a mobile game would still likely mean the game included extensive advertising (as seen previous when a level on Rovio Entertainment Corporation’s *Angry Birds 2* was sponsored by Honey Nut Cheerios). The final code included in this theme was the *WhatsApp Model* where the ideas specified that mobile games could be ‘like WhatsApp’. Participants seemed to be aware that WhatsApp did not include any kind of advertising or monetization (for them) and implied that would like mobile games to be similar. There was no evidence that participants fully understood that the income within WhatsApp is generated through charging business customers.

**Table 1.** Codebook from analysis of responses to ‘How should developers make money?’

Code	n	Description	Example
<i>In-Game Advertising</i>	15	Refers to existing examples of advertising within gameplay for monetization	‘Have ads within the game’
<i>In-Game Purchases</i>	12	Refers to existing examples of purchasing possibilities within gameplay for monetization	‘In game purchases’
<i>Player Pays</i>	18	Refers to the player paying for the game, so no further monetization is necessary	‘Pay for the game up front’
<i>App Stores Pay</i>	3	Refers to app stores paying game developers	‘App store pay to have apps on their store’
<i>Popularity</i>	2	Refers to income being based on popularity with players	‘How many people download it’
<i>Philanthropy</i>	4	Refers to wealthy benefactors or charitable activities as a means for monetization	‘Charity Events’
<i>State Funding</i>	3	Refers to income from state sources	‘Money from the queen’
<i>Change Business Model</i>	3	Refers to the publishers of games changing their business model to generate additional income	‘Get Investors’
<i>Dark income</i>	2	Refers to generating income via unethical methods	‘Add a gambling aspect to the game’
<i>Other Advertising</i>	6	Refers to advertising possibilities outside of the game	‘Normal TV Adverts’
<i>Sponsorship</i>	5	Refers to the use of sponsorship as a means for income	‘Get a sponsor’
<i>WhatsApp model</i>	2	Refers to a business model like that used by WhatsApp (i.e., no monetization within the app)	‘Like WhatsApp don’t make money but worth money’
<i>Less Annoying</i>	9	Refers to ideas about how to improve current in-game monetization mechanisms for the player	‘Adverts that don’t stop you playing’

**Improving Experience Theme:** Data in this theme was related to altering the experience of existing in-game advertising primarily to improve the experience for the player when encountering advertising within a game. This theme was solely built from the *Less Annoying* code as the coders considered this data to be the most relevant to the HCI community as it focusses on the experience of child users. The theme is also novel as, while monetization strategies are known to be annoying for the user (e.g., [6, 7]), work to-date has not yet explored how this situation can be addressed. As discussed earlier in the related work section, the experience of in-game advertising is dictated to a large extent by the Ad Network API chosen by the developer and (maximising revenue from) the monetization metrics used, so the developer may ultimately have limited control over player experience. All nine examples for this theme were shown earlier in Fig. 2. Eight of the ideas specially referenced ‘Ads’ and several included specific and practical ideas for improvement: ‘British voices for the adverts...’, ‘Bottom of the screen ads’. Other ideas implied addressing the interstitial nature of advertising within mobile games: ‘Adverts that DONT stop u playing’, ‘non interrupting ADS’, ‘...more skippable’, and one proposed an alternative way for players to access adverts ‘make a page on the game which you can look at ads’. These suggestions appear to refer to interstitial adverts (which typically take up the entire screen and therefore interrupt all possibility for gameplay) which are presumably used to ensure CPM/CPV returns are maximised, and which may potentially lead to high returns on other metrics (e.g., CPC). While developers may be unwilling to make changes that could directly reduce their income, other suggestions, such as the altering the voice-overs on adverts to be country-specific, could potentially increase both gameplay experience and effectiveness of the advert [28].

## 4 Conclusion

The free-to-play business model is widely used and extremely lucrative within the mobile games development industry, however the associated monetization techniques necessary to generative income for developers are known to be problematic, having been identified as ‘predatory’ [22], ‘misleading, aggressive or unfair’ [24] and often including deceptive design [7]. This situation is particularly concerning for younger users who are prolific users of mobile games and are likely being exposed to a range of these problematic monetization techniques on a regular basis. While there is a growing body of work on deceptive design and monetization with adult users, there are presently far fewer examples of studies focussing on younger users.

This work sought to explore young peoples’ ideas for how developers should make money within free-to-play mobile games and gathered 84 usable ideas from 62 participants (aged 12–13) which yielded 14 codes organised into four top-level themes of Status Quo, Novel Mechanisms, Developer Possibilities and Improving Experience. The theme of Improving Experience of monetization is perhaps the most relevant to the HCI community and highlights aspects of mobile game monetization which could be explored in future work. In this theme participants were highlighting the negative impact of existing monetization techniques and suggesting ideas for improvement. While the implementation of some of these ideas (such not using interstitial adverts) may have a negative impact on advertising effectiveness and monetization metrics discussed in the



related literature section, other ideas may improve the effectiveness of the adverts in addition to improving the experience of encountering them (such as ‘British voices for the adverts’). The other themes highlighted interesting ideas around income for developers which, while not necessarily practical, highlight the potential value in taking a participatory approach to exploring monetization. For example, it was surprising to the authors that participants had identified the business model used by WhatsApp as a positive example that games developers may be able to follow, even though it was clear they did not fully understand the specifics of that model. We see this dichotomy, participants thinking being both sophisticated and unsophisticated, as valuable in providing new insights.

Within this work the context of the participants should be considered carefully. We would argue that the wide range of interesting responses within the data implied that participants understood the importance of income for mobile game developers; for example, there were no responses stating that monetization should be removed entirely, only ideas for solutions. Younger participants, less able to empathise with the financial needs of the developers, may have been less sympathetic, which may have influenced ideas generated. The context of this study was the UK (where services such as education and healthcare are free for children) which may have influenced ideas from participants (especially those aligning with the code ‘State funding’); it would be interesting future work to conduct similar studies in countries with different approaches to funding of the key services that young people encounter.

We hope the findings from this paper will help promote discussion around new, and potentially participatory, approaches for monetization within the technologies that young people use, and specifically focus attention and further study on the user experience of monetization techniques used within mainstream mobile games.

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