An Investigation into Usability and First Time User Experiences within a Mobile Gaming Context

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With scientific research regarding usability and guidance plus First-Time User Experiences (FTUEs) in video games currently sparse, it is imperative to assist existing and future developers in the field build usable games and effective guidance systems. For the work presented in this publication, research was conducted to investigate the effects of guidance on mobile game usability using two independent groups; featuring two commercial games with and without the presence of a First-Time User Experience. The results show, with significance, that guidance via a FTUE increases one element of usability, 'information quality'. However, overall usability is not increased by the presence of a FTUE.

Keywords: Usability, First Time User Experience (FTUE), Game Design.

1   Introduction and Background

Usability, as defined by ISO 9241-11 (Guidance on usability) is termed as "The extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context of use" [1]. Unlike software and other tools whereby usability techniques are employed to aid production or productivity, games are played for the sole reason and purpose of enjoyment/satisfaction. The key distinction arguably changes the weighting of the three areas identified above by ISO 9241-11, from an equal weighting to a hierarchy. Satisfaction needs to be prioritised, with efficiency and effectiveness following. In the following passage, we contextualise the three areas defined by ISO 9241-11 (effectiveness, efficiency and satisfaction) for our interest in games [1].

Satisfaction: Enjoyment and fun can be seen as the primary and sole motivation for an individual to engage in a computer/video game. Myer's study of Game Player Aesthetics [3], identified "challenge" as "the most preferred characteristic", highlighting balance as an important variable to tune regarding Satisfaction. Myer's finding supports and provides strong reasoning for the use of the widely accepted heuristic of creating an interface and control method that can be learned, used and mastered with

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as little resistance as possible, preparing and enabling the player to enjoy and utilise all available mechanics and, ultimately, strategies [3]. Optimising the complexity and interactions of an interface can aid escapism and support immersion [4]. Effectiveness: In the context of games, this can be attributed to how accurately and effectively the players can express themselves via the available interface and interactions to achieve specific goals, achievements or desires. Efficiency: Similarly, efficiency in computer games usability represents the relationship between the inputs and interactions, plus the success on specific goals, achievements or desires. The inputs may require considerable dexterity in order to enable the player to achieve success, or they may be achievable with comparatively little skill.

With usability contextualised to our interest in games, we can begin to discuss the effects of usability in games. As represented in Adams' Story Engine Diagram, the interface is the source of both input and output [5]. Furthermore, in the Mechanics, Dynamics and Aesthetics (MDA) framework, it can be noted that the aesthetics of a game are the first and foremost of its elements to be experienced by the player [6]. Usability affects the player's immediate and most intimate mechanism, allowing all of the game's elements to function and ultimately be enjoyed. Schell [4] describes and illustrates the importance of designing and building effective interactive systems in games. Schell's recommendations are also echoed in Google's User Experience Principles [8].

The design heuristics mentioned above aim to create and establish a fundamental/native usable system, aiding the visceral and primitive nature of the user's experience. However, beyond the fundamental design of an application, usability can be aided through effective guidance and teaching, often referred to as 'onboarding' [8]. We will be exploring the First Time User Experience and specifically the use of FTUEs embedded in games on mobile devices. This is towards discovering how, and indeed if, these are effective at increasing usability.

2   Method – Games and Protocol

Two games were selected to review the effect of guidance upon usability; 'Super Mario Run' and 'Linia'. The experiment was conducted on an iPhoneSE, with 20 participants of mixed gender, selected from various courses at Bournemouth University. The games were selected based on their similar yet contrasting interaction complexity, since they can both be controlled with one finger. However, the combinations and precision of interactions, along with other gameplay manipulations such as pace, challenge the player's inputs past the seemingly 'simple' one-touch interaction. With two groups, control and treatment, the participants were introduced to the questionnaire with a brief overview of the protocol and events to come. Once the participants had confirmed they were unfamiliar with the games, they were placed in either the control or treatment group (based on a sequential placement). Random counter-

balancing was used to determine the first game. Depending on whether the participant was administered guidance and information (Treatment) or not (Control), they would either receive 90 seconds (Treatment) or 60 seconds (Control) to play the game. This time differential exists due to the additional dialogs, cutscenes and other learning and guidance material found present in the Treatment group's experience. The participants were instructed to try their best at completing whatever goal or objective they believed they should be attempting to achieve. The termination clauses were either time limit (as outlined above) or the completion of the level/section. Once the session terminated, the participants were asked to complete an adapted IBM PSSUQ, scoring the usability over 11 questions on a 7-point Likert scale [7]. Upon completing the questionnaire, the participants would then be asked to play the remaining game and complete the relevant second questionnaire. The questions were as follows; 1. Overall, I am satisfied with how easy it is to play this game, 2. It was simple to play this game, 3. I could effectively complete the objectives and challenges, 4. I was able to complete objectives and challenges quickly, 5. I was able to efficiently complete objectives and challenges, 6. I felt comfortable using this system, 7. It was easy to learn to play this game, 8. Whenever I make a mistake in the game, I recover easily and quickly, 9. The organisation of information on the game screens is clear, 10. The interface of this game is pleasant and, finally, 11. I like using the interface of this game.

3   Results and Discussion

The results seen in Figure 1 display correlations between guidance (existence of FTUE) and usability scores, collected and measured using an adapted (i.e. with the language contextualised to games) version of the IBM PSSUQ. Combining the groups among Mario and Linia allows for the comparison of control versus treatment across both games, providing insight into cross-genre correlations regarding the presence of guidance. Using the non-parametric Mann-Whitney U test [2], the two groups differed significantly in regards to Information Quality (Questions 8 and 9 Av.), reporting $U = 125.5$, $Z = -2.035$ and $p = .043$, displaying a positive correlation between the games' usability, specifically the information quality and guidance. The authors' belief is that with guidance comes understanding, allowing the player to utilise all available information, from UI elements to in-game mechanics, thus improving usability. In contrast to this, Overall Usability (Q1 to Q11) returns $U = 170.5$, $Z = -799$ and $p = .429$, which conveys that there is no significant result for the correlation of overall usability between the Control and Treatment groups. We believe that the design of the intuitive design and interaction model is crucial to usability, with guidance only aiding a game's usability. An interesting result is observed for the Mario game (Control and Treatment), whereby Q1 scored a lower mean score in the Control group (Mean = 1.9), whereas in the Treatment group it has a Mean = 2.40. Although it is not significant ($U = 26.5$, $Z = -1.867$, $p = .075$), it does approximate a significant result and we believe it deserves noting.
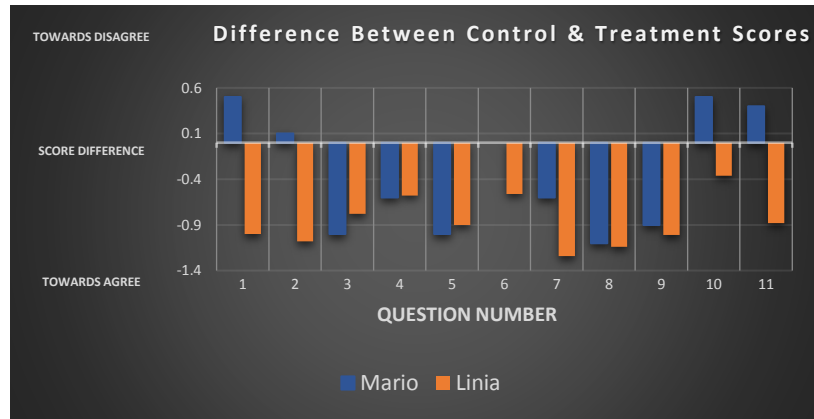
Figure 1- Difference between Control & Treatment scores

The above highlights the possibility of a negative correlation between "Overall satisfaction of ease of play" and guidance via a FTUE. It is our belief that the increase in overall satisfaction can be attributed to the player's self-discovery of the controls and interface (Control Group), where they are free to learn with full agency/autonomy. This is the kind of autonomy and agency that is unavailable to the players presented with a FTUE, because of forced scenarios and intrusive dialogs (Treatment Group).

In the work in this paper it is shown that FTUEs have the power to affect user perception in elements of usability. From a game design perspective, this is impactful. A macro view of this is useful, however, it is yet unclear on the micro scale what influences control this effect. Future work will consider trying to elicit several heuristics to guide game designers in the generation of FTUEs.

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