

UNIVERSITY OF LONDON



PRELIMINARY PROJECT REPORT

GAMIFICATION OF THE RESEARCH PROCESS

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B.Sc. Creative Computing

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UNIVERSITY OF LONDON

BSC IN COMPUTING AND RELATED SUBJECTS FOR INTERNATIONAL PROGRAMMES STUDENTS

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DECLARATION

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- This project report is all my work and I have acknowledged any used of published or unpublished works of other people.

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“Life is too short to do the things you don’t love doing.”
- Bruce Dickinson

Contents

1	Introduction	2
1.1	Project Inspiration	2
1.2	Project Study Relevance to B.Sc. Creative Computing Route	2
1.3	Project Study Relevance to the Academia and the Workplace	3
1.4	The Supervisor	3
2	Aims and Objectives	4
2.1	Aims and Objectives	4
2.2	List of Deliverables	5
3	Methodology and Project Plan	6
3.1	Phase 0	6
3.2	Phase 1	6
3.3	Phase 2	7
3.4	Phase 3	7
4	Progress to Date	9
4.1	Literature Review: Summary	9
4.1.1	What Is Gamification ?	10
4.1.2	Psychology behind Gamification	10
4.1.3	Game Design	11
4.1.4	Examples of Existing Systems	11
4.1.5	Gamification Criticism	12
4.2	Survey Analysis	12
4.2.1	Metadata	12
4.2.2	Summary of Findings	13
4.3	Mobile Application	17
4.4	Project Progress vis-à-vis Proposed Plan	19
5	Planned Work	20
5.1	Project's Current State	20
5.2	Planned Work	20
	Appendices	21

Chapter 1

Introduction

1.1 Project Inspiration

The writing of a dissertation is unlike any other academic task as it involves putting into practice academic and nonacademic skills. Although students may be well prepared to face the academic portion, they may lack nonacademic aspects like project and time management, presentation skills, public relations and communication skills. As the majority of students may have never attempted a project of such dimensions, it is natural for students to feel overwhelmed and insecure about the dissertation. If such feelings are not addressed, dissertation problems may be easily transformed into vicious cycles like procrastination and frustration.

A dissertation must not be envisioned as a burden, but rather as an opportunity to master academic-and work-related skills on an interesting topic. However, this idea is difficult to introduce through the usual channels as it is often the case that negative sentiments outweigh positive ones. Contrariwise, the approach may be altered through the employment of *gamification*, thus making the compilation of a dissertation engaging and rewarding to the extent of encouraging students to continue their studies at a postgraduate level.

Having already conducted a dissertation and failed to appreciate the research journey, I became inspired in making the undertaking of research more rewarding through the utilisation of gamification concepts. In return, I aim to supply the academia with an engaging and enjoyable solution of how research can be conducted.

1.2 Project Study Relevance to B.Sc. Creative Computing Route

The project involves an element of coding, and hence, it is related to the material explored in *Software Engineering and Algorithm Design* and *Graphical Object-Oriented and Internet Programming in Java*. Also, this project involves an element of usability and user interface that delve into topics explored in the *interaction design* module. Thus, this dissertation bridges the gap between the technical domain of software engineering and the psychological aspects of interaction design.

1.3 Project Study Relevance to the Academia and the Workplace

The proposed dissertation is of academic value as it targets one of the core requirements at any tertiary (or above) academic level. It deals with helping undergraduates produce reports of high standards at no added cost. On the other hand, the proposed dissertation is less inclined towards practitioners and the workplace as its core focus are undergraduates and not enterprises, solutions or businesses. Nonetheless, the concepts presented in this study can be easily transferred to the commercial world, where the business field follows a form of the research process.

1.4 The Supervisor

The conduct of this dissertation is being supervised by Mr. Dylan Seychell, B.Sc.IT (Hons.), M.Sc. A report (either verbally through physical meetings or electronically via e-mails) is provided to the supervisor on a frequent basis. The report comprises

- 1 Developments registered during the week under review
- 2 Problems encountered during the week under review
- 3 Possible solutions and remedies to solve the issue at hand
- 4 Way forward and tasks to be accomplished during the upcoming days

Chapter 2

Aims and Objectives

2.1 Aims and Objectives

Can the writing of a dissertation be made more enjoyable and engaging through gamification to the extent of making students want to undertake the same process again?

In general, this dissertation strives to provide a tangible answer to the above question. It starts with identifying problems that make the compilation of a dissertation a burden. It continues by proposing a *gamified* software solution (mobile application) which aims to reduce the identified problems. The list below provides a detailed account of the aims and objectives of this dissertation.

Aim No. 1: To understand the current attitude towards the conduct of a dissertation and research in general

Objectives

- 1 To conduct an online survey amongst university undergraduates who are currently writing their dissertation
- 2 To establish the current situation *vis-à-vis* the conduct of a dissertation
- 3 To determine how the students feel towards the idea of a gamified process
- 4 To determine students' replies towards the use of applications which can aid in the gamification process

Aim No. 2: To gamify a dissertation writing process

Objectives

- 1 To establish a strategy with which the process can be gamified
- 2 To implement the strategy listed in 2i through the production of a mobile app software which gamifies the dissertation process

Aim No. 3: To investigate applied gamification among students

Objectives

- 1 To physically test the mobile app among students
- 2 To survey students who tested the mobile app in order to extract data on the gamification experience
- 3 To summarise and present the findings of this study as part of the fulfilment of the B.Sc. IT (Creative Computing)

2.2 List of Deliverables

The text below provides a brief account of the material that will be handled as part of the fulfilment of the B.Sc. IT.

Deliverable No. 1: Statistical Reports on the Current Situation - This deliverable is in line with aim no. 1, and it comprises a written summary based on the findings extracted from the survey. The report will contain tabular as well as graphical statistical information with the purpose of explaining the current situation among students. The report will also shed light on the possibility of having a gamified process. A summary of the findings is included in *section 4.2 of Chapter 4*.

Deliverable No. 2: Mobile Application - This deliverable is in line with aim no. 2, and it relates to the production of a mobile app software. The mobile application's purpose is to gamify the user's experience related with the production of a dissertation via mechanisms like levelling up, earning of badges and leaderboard. An agile development approach will be utilised for the development of the software. Furthermore, the mobile app is to be developed using an Android application package file (APK).

Deliverable No. 3: Written Report and Survey - This deliverable is in line with aim no. 3, and it consists of a written document. The document will provide a detailed insight into the interesting findings explored during this study, the methodologies employed, and a review of the literature. Furthermore, the report will present-if possible-the findings and results in textual, graphical (graphs and charts) and tabular format. Other relevant documents and materials like consent letters and questionnaires, which are directly related to the study, will be appended to the written report.

Deliverable No. 4: Video Manual - The scope of this deliverable is to provide a visual manual on how users can operate the mobile application.

Chapter 3

Methodology and Project Plan

The methodology employed deals with the gathering of data and with the compilation of relevant statistics in order to arrive to a more complete and tangible understanding whether research can be made more engaging through gamification. The proposed work strives to answer the following:

- 1 What is the general feel among students who are currently writing a dissertation?
- 2 How can the process be made more fun and engaging through gamification?
- 3 If the process of writing a dissertation is made more enjoyable, will that lead to more students extending their studies to a postgraduate degree?

The project in question was organised into four phases. Table no. 1 illustrates the start and end dates and the duration of each phase. Each phase comprised numerous tasks, where each task was subdivided into smaller jobs. The Gantt chart appended at the end of this chapter provides a detailed description of the phases and timings.

3.1 Phase 0

Phase 0 served as a preliminary phase, where the primary aim was to get oriented with the tools which were to be used for the production of the dissertation. In Phase 0, LaTeX, TeXlips, MikTeX, BibTeX, Eclipse, Android APK and MS Project were explored.

3.2 Phase 1

Phase 1 served as the dissertation introductory phase. It comprised the following:

Phase	Start	End	Duration
Phase 0	1st July 2013	31st July 2013	23 days
Phase 1	1st August 2013	30th November 2013	67 days
Phase 2	1st December 2013	2nd April 2014	89 days
Phase 3	2nd April 2014	15th May 2014	32 days

Table no.1 Phases and duration

Writing of Literature Review: Online material (mainly journals and research publications) were consulted. Material that was found relevant to the study was read and summarised into a literature review.

Conduct of Survey: This task included;

- 1 deciding upon the sample size and consulting with the supervisor
- 2 drafting the questions and consulting with the supervisor
- 3 implementing the questions using the online tool SurveyGizmo
- 4 producing a cover e-mail and a consent letter and
- 5 liaising with university of Malta (UoM) and with St. Martin's Institute of Higher Education (SMIIT) registrar to distribute the survey among students attending both institutions

When the data-collection period expired, all data were exported from the online system and imported to IBM SPSS. From then on, the data were vetted, and statistical reports were generated.

Preliminary Project Report (PPR): The scope of such a report is to provide a preliminary overview of the dissertation topic, planned work, work conducted and way forward.

3.3 Phase 2

Phase 2 strives to answer the question under review through the production of a mobile application. Phase 2 of the dissertation project comprises the following tasks:

Development of Mobile Application: Development will be done using Android APK, and it will be done using iterative software engineering approaches similar to agile.

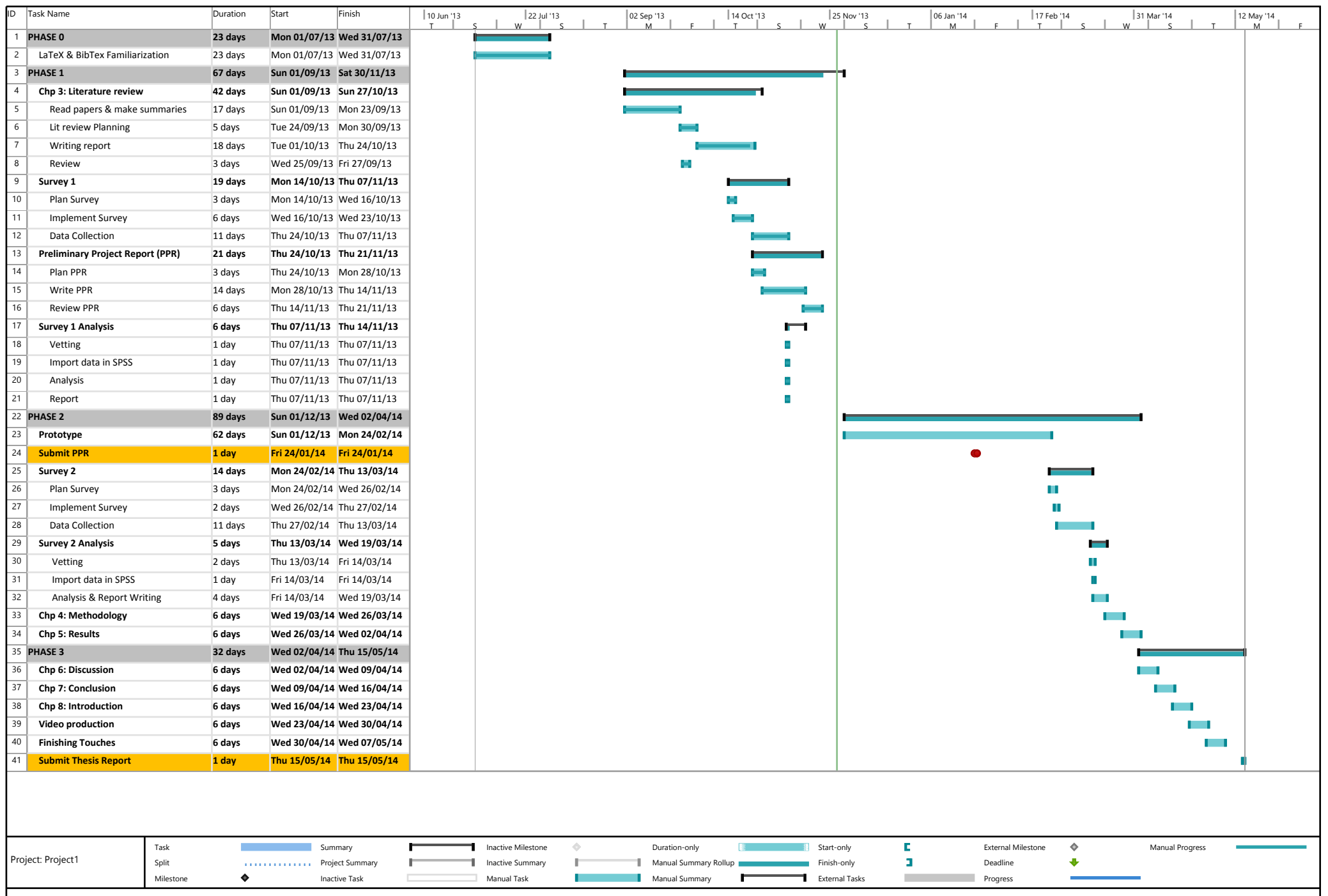
Second Survey: The aim for the second survey is to test the mobile application among subjects. The survey will focus on investigating the users' experience rather than the functionality and aesthetics of the mobile application. The same methodology and tools utilised in the first survey will be employed for the conduct of the second survey.

Writing Methodology and Results: Notes taken during the conduct of the surveys and the production of the mobile application are to be summarised into methodology and results. These two chapters will explain the steps taken, decisions made, how and why decisions were made in such a fashion and any assumptions taken.

3.4 Phase 3

Phase 3 marks the concluding section of this 11-month project as it deals with

- 1 writing the discussion chapter
- 2 writing the conclusion chapter
- 3 writing the introduction chapter
- 4 producing a short video manual
- 5 finalising the work



Chapter 4

Progress to Date

This chapter intends to provide a summary of the work performed. At the time being, and as explained in Table no. 1 in Chapter 1, jobs assigned to Phase 0 and Phase 1 have been concluded. Section 5.1 provides a detailed explanation of the completed tasks related to Phase 1 whilst section 5.2 accounts for tasks which need to be accomplished in the upcoming weeks.

4.1 Literature Review: Summary

Jesse Schell took the world by surprise when he presented a methodology wherein the future games or aspects of games will possibly take over humans' daily routine Schell (2010). Introduced through marketing channels, games aim to revolutionise people's daily interactions with goods, products and services with the aim of providing a more engaging, fulfilling, enjoyable and fun experience. In return, users will be more efficient, motivated and happier with their conduct at the expense of little extra effort or cost.

Deterding et al. define gamification as the use of game design elements (e.g, trophies, badges and leaderboards) in a nongaming environment (e.g, work environment) Deterding et al. (2011). More specifically, Anderson and Raine define gamification as the utilisation of game mechanics (e.g, feedback and loops) as a means of alleviating interaction and interest Anderson & Rainie (2012). Smith, however, employs a definition of gamification that is based on the following three requirements:

- i The process must have a clear and reachable goal.
- ii The process must have obstacles that must challenge the user.
- iii The process must provide a collaborative yet competitive environment.

The concept of gamification gained momentum through the publication of books such as Gabe Zichermann's *Game-Based Marketing*, which proposed the use of gamification in marketing, and Jane McGonigal's best seller *Reality Is Broken*. McGonigal, stressed that gaming elements provide a solution for modern humanity problems McGonigal (2011). In their work, Reeve and Read claim that gaming elements may shape people's working habits and businesses processes Reeves & Read (2009). Priebatsch, shares similar thoughts in his work as he stated that games will gradually change the world of humans Priebatsch (2010).

4.1.1 What Is Gamification ?

Deterding et al. supplied an exhaustive explanation of gamification where *the use of game design element in nongame context* is unpacked into

Game - Deterding et al. refer to Caillios's concept of *paidia* and *ludus* to clarify the distinction between *games* and *play*. According to Caillios, *paidia* (playing) relates to boundary-less improvised behaviour whilst *ludos* (gaming) incorporates behaviours that are organised and structured via rules and objectives Caillois (1961).

Design - For games to be fun, they incorporate systematic, thoughtful and artistic designs which, in return, make games far more than just an element. Game designers avail of thought processes which are novel, unique and specific in solving problems. Such problem-solving approaches can be employed outside the gaming environment Werbach & Hunter (2012).

Element - Brathwaite and Schreiber argue that whilst *series games* are full-fledged nonentertainment games, gamified applications utilise only elements of games Deterding et al. (2011). The distinction between *game* and artefacts with gaming elements is not clear as the distinction between the two concepts relies on personal and social elements as well as individual perspective. According to Deterding et al. the optimal way to identify game elements is to consider game elements as building blocks shared among separate games rather than a set of tools which can be employed in a game Deterding et al. (2011).

Nongaming - Nongaming context may refer to situations and experiences which have no relation to games such as work and school. Parallel to *serious games*, gamification avails of game elements in a nongaming context for purposes of engagement and motivation Deterding (2011).

4.1.2 Psychology behind Gamification

To understand why gamification mechanics work, it is imperative to first study human psychology (motivation, ability and trigger) as psychology is the backbone of gamification. Studies in intelligent systems and HCI underscored the need for a shift from usability to design and user understanding for a deeper engaging experience. Such change places hurdles on practitioners and scholars in finding new ways which, engage users and direct their attention towards particular purposes. Previous experiments in social and computer studies shed light on various approaches chief among games and gamification Liu et al. (2011).

Motivation - Psychology segments motivation into two main groups: intrinsic and extrinsic. Whilst the former is the kind of motivation derived arbitrarily from within a person, the latter is the kind of motivation that is fuelled by tangible world elements, such as the desire for money and power. Gamification harness, both intrinsic and extrinsic motivation through the employment of mechanisms such as points and badges with the purpose of helping users to accomplish specific tasks.

Ability - Ability deals with skills and mental capacity pertaining to individuals in performing tasks. Ability can be increased by splitting complex tasks into smaller manageable ones. Fogg states that individuals need to have ability as much as motivation for the completion of a task, because when there is lack of ability, the target behaviour will not occur Fogg (2009).

Trigger - A trigger is an action which causes other actions to fire. A trigger is registered when users are motivated and have the required ability to perform a task.

4.1.3 Game Design

When designing a gamified experience, practitioners focus and avail of gaming concepts which, yield the maximum impact on players. These gaming concepts can be better defined through the MDA (mechanics, dynamics and aesthetics) framework, which provides as systemic thinking in describing the interplay of those game elements and applies them outside gaming environments.

Game Mechanics - Game mechanics are the game's functioning components. These mechanics provide game designers with full control of level, designs thus giving them the ability to guide players towards certain actions and behaviours.

Game Dynamics - Whilst game mechanics concern the game's functional components, game dynamics are related to the player's interaction with the mechanics. Game dynamics show what the responses of the player *vis-à-vis* the mechanics of the system on both individual and collective levels. Thus, game dynamics arise from game mechanics.

Game Aesthetics - Zichermann defines game aesthetics as how the game makes the player feel during play time Zichermann & Cunningham (2011). More specifically, Hunnicke et al. in the study *MDA: A Formal Approach to Game Design and Game Research* define game aesthetics to be “the desirable emotional responses evoked in the player, when s/he interacts with the game” where the desirable emotional response includes the nonexhaustive taxonomy below:

- 1 Sensation - Game as a sense of pleasure
- 2 Fantasy - Game as make-believe
- 3 Narrative - Game as a drama
- 4 Challenge - Game as an obstacle course
- 5 Fellowship - Game as a social framework
- 6 Discovery - Game as an uncharted territory
- 7 Expression - Game as self-discovery
- 8 Submission - Game as a pastime

4.1.4 Examples of Existing Systems

The literature on gamification for dissertation writing is still limited since it is still a young field of study, and thus, only close examples like the ones listed could be explored.

Write or Die 2 - The application *Write or Die 2* focuses on eliminating any writer's block. The application provides solutions for consequences like procrastination and frustration as it embraces rewards for writing and penalties for not writing. The application provides nice environments which stimulates writing but which disappears if the user stops writing. The penalty section introduces features that are earned if users do not write, like visual and hearing stimuli. The user can write to avoid such stimuli.

Pain Squad Mobile App - Designed around a crime investigation environment, the scope behind *Pain Squad Mobile App* is to make easy the compilation of pain reports filed by sick children. After the completion of three consecutive reports, recruits (users) are informed by the chief (application AI) that they are being promoted to a higher police rank. Messages are not just simple text messages, but videos featuring the cast of Canada's dramas *Flashpoint* and *Rookie Blue*.

National Novel Writing Month - The scope of *National Novel Writing Month* (NaNoWriMo) is to help people to stop being afraid of writing long documents. Instead, NaNoWriMo encourages people to write a novel of 50,000 words in period of one month. The quest has been gamified through word counts, deadlines and progress bars, which produced an outstanding outcome of 305,903 participants undertaking the challenge during the last run (November 2013).

750 Words - The online application *750 Words* utilises badges and points to encourage users to write approximately three pages of text on a daily basis. As the user advances, the earning of badges increases in difficulty.

Gamification for Project Management - A dissertation can be considered as a business project and thus handled using the same project management tools. Sammut in his dissertation titled *Exploring the Potential of Gamification for Project Management within a Corporate Environment* utilised a software prototype to gamify the project management process. The software prototype allowed employees to earn points and level up if projects were submitted before or on a stipulated deadline. From his studies, Sammut concluded that if gamification is employed correctly, it tends to boost employees' motivation and engagement. Further, Sammut stated that gamification does not complicate business workflows if the appropriate user-design concepts are implemented Sammut (2012).

4.1.5 Gamification Criticism

From literature, it is evident that gamification is at the top of marketing, sociology, psychology and IT lists. As this concept is gaining popularity scholars against this new trend are heavily filing criticism as some are identifying the domain to be a mere buzzword or a superficial *pointsification* system Robertson (2010). Nicholson states that the primary problem with gamification is the conflict that it creates as gamification works against reducing internal motivation Nicholson (2012). To this, Nicholson introduces the concept of *meaningful gamification*, which strives to place the users' internal motivation up front. Game designers like Jon Roff and Margaret Robertson have distanced their work from gamification, while academics like Kevin Salvin states that gamification is a flawed concept as it misleads users who are unfamiliar with the concept Salvin (2011).

4.2 Survey Analysis

4.2.1 Metadata

Survey Mode - For the ease of distribution and data collection, an online survey was conducted among students who are currently in the process of writing a dissertation. The *SurveyGizmo* basic plan was utilised to host, distribute and collect the survey and data.

	Response Rate					
	UoM		SMIIT		Total	
	No.	%	No.	%	No.	%
Respondents	1,580	66.1	23	79.3	1,603	66.3
Nonrespondents	809	33.9	6	20.7	815	33.7
Total	2,389	100	29	100	2,418	100

Table no. 2 Response rate

Sample - The total sample size totalled to 2,418 subjects, and it covered students who are currently reading for a degree with UoM (2,389 subjects) and with St. Martin's Institute of Higher Education (29 subjects).

Survey Distribution - Due to data protection, subjects' e-mail addresses were not provided by both institutions. Instead, an e-mail containing the cover text and the link to the survey page (see Appendix no. 2) and a consent letter containing FAQs and the purpose of the survey (see Appendix no. 3) were e-mailed to both universities registrars, who took the responsibility to distribute the survey among subjects.

Data Collection - The data-collection period lasted for 15 days (24th October 2013 to 7th November 2013), where subjects were instructed to fill in and submit the online survey. During this period, an e-mail reminder (see Appendix no. 4) was sent (on 31st October 2013) to all students to encourage nonrespondents to submit the survey.

Response Rate - As per Table no. 2, the total response rate amounted to 66.3%. From an institution perspective, response rate pertaining to UoM and SMIIT amounted to 66.1% and 79.3%, respectively. The total nonresponse summed to 33.7%, with UoM and SMIIT registering a nonresponse of 33.9% and 20.7%, respectively.

As illustrated in Table no. 3, out of the sampled population, the female response (55.7%) for the age category 18 - 24 exceeded the male response (53.4%) for the same age category. Conversely, the age category 25 - 29 registered a higher response among the male gender (44.9%) than the female gender (43.5%).

4.2.2 Summary of Findings

Current Situation - Question no. 5 of the survey asked subjects whether they had ever written a dissertation before. As illustrated in Figure no. 2 the majority of respondents (95.1%) are new to the writing of a dissertation. The remaining interviewees (4.9%) claimed that this is not the first time that they are undertaking the writing of a dissertation.

In question no. 6, subjects were asked to quantify the approximate daily hours that they plan to work on the dissertation project. As shown in Table no. 4, the average hours that the majority of students are willing to spend working on a dissertation are three hours a day. It is interesting to notice that such an average was constant among both universities and among the majority of the age-groups.

		Gender and University					
		UoM		SMIIT		Total	
		M	F	M	F	M	F
		%	%	%	%	%	%
Age	under 18	-	-	-	-	-	-
	18 - 24	53.3	55.5	57.9	100	53.4	55.7
	25 - 29	45.1	43.8	36.8	-	44.9	43.5
	30 - 34	0.6	0.3	5.3	-	0.8	0.2
	35 - 39	0.3	0.1	-	-	0.3	0.1
	40 - 44	0.4	-	-	-	0.4	-
	45 - 49	0.1	-	-	-	0.1	-
	50 - 55	-	0.3	-	-	-	0.2
	56 - 60	-	-	-	-	-	-
	61 - 64	0.1	-	-	-	0.1	-
	65 - 69	-	-	-	-	-	-
	70+	-	0.1	-	-	-	0.1
	Total	100	100	100	100	100	100

Table no.3 Response by Age, gender and university

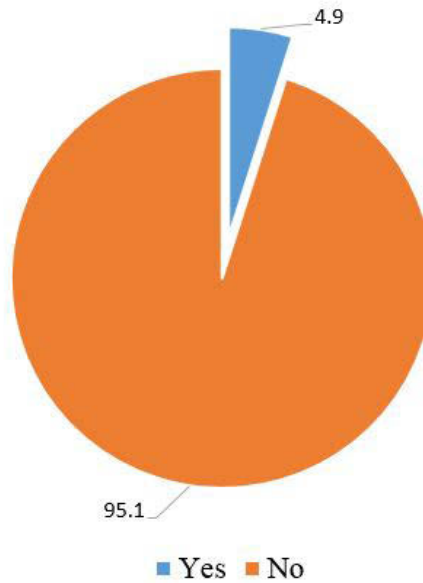


Figure no. 2 Have you ever written a thesis before? (Q5)

		Mean Hours	
		UoM	SMIIT
Age	under 18	-	-
	18 - 24	3	3
	25 - 29	3	3
	30 - 34	3	3
	35 - 39	3	-
	40 - 44	3	-
	45 - 49	2	-
	50 - 55	6	-
	56 - 60	-	-
	61 - 64	1	-
	65 - 69	-	-
	70+	15	-

Table no. 4 Average hours students plan to work on a dissertation by age and university

Challenges Faced - The scope of this survey lies in question no. 7 as, this question strives to extract the core problems faced by students during the undertaking of the dissertation. Once the core problems have been identified, they could be addressed through the use of gamification principles and hence minimise the burden as much as possible.

As illustrated in Figure no. 3 students attending both UoM and SMIIT agreed that busy schedules are a major obstacle for the writing and completion of a dissertation. Figures registered across both UoM (57%) and SMIIT (78.3%) ranked this variable as the top primary problem among all other studied problems. Thus, it is imperative to note that any solution suggested in this dissertation must, target the problem of busy schedules through the use of gamification.

Miller, in her research states that although students may be constantly thinking about their dissertation, other activities seem to take precedence when it comes to actual production Miller (2007). In Figure no. 3, numerals registered by UoM (54.4%) and SMIIT (69.9%) attendees are in line with Miller's studies as these statistics indicate that students consider *lack of focus* as the second major challenge experienced during the writing of a dissertation.

Procrastination is the factor that 'eats' away a student's dissertation productivity, and research shows that it may originate from various sources, like fear of failure, overwhelming feelings and poor time management. Schouwenburg in *Counseling the Procrastinator in Academic Settings* states that over 70% of students exhibit procrastination behaviour during the conduct of the dissertation Henri C. Schouwenburg (2004). In Figure no. 3, SMIIT students ranked procrastination 52.2%, whilst students attending UoM ranked procrastination in the third place 50.3%. Although the classification varies across institutions, it is worth noting that the figures registered are high, thus indicating that students are concerned about procrastination being a problem.

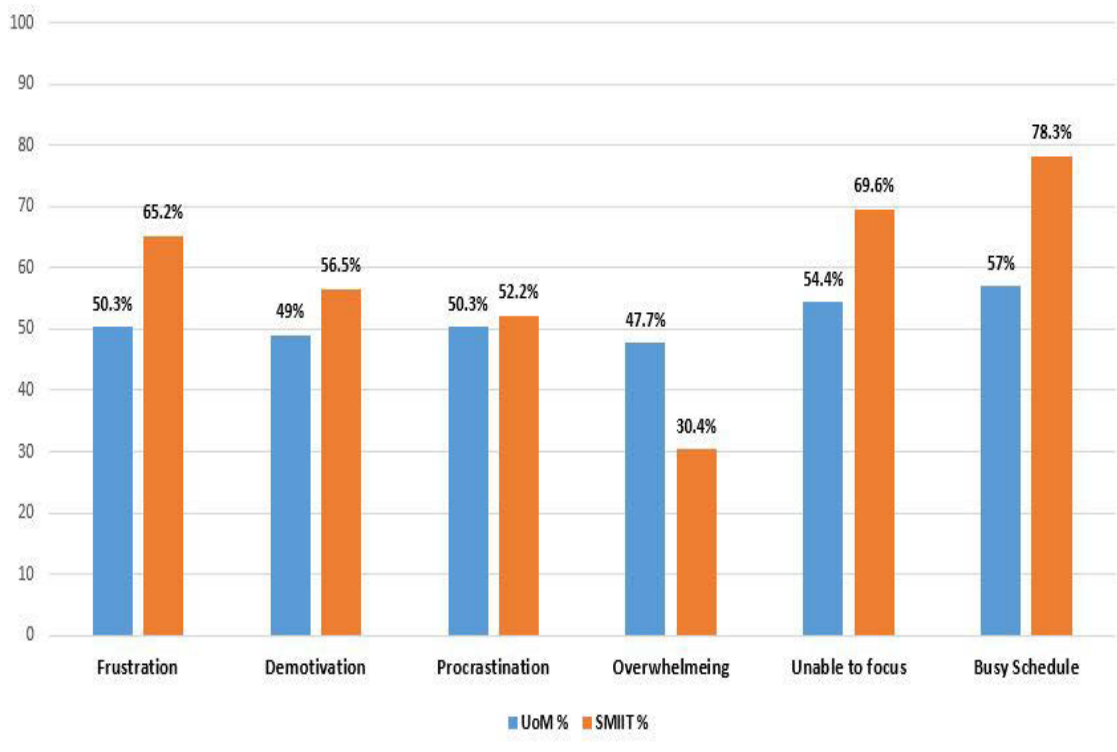


Figure no. 3 Dissertation challenges faced by students across the two universities. (Q7)

Berkowitz, defined frustration as the unexpected obstacle blocking the achievement of an anticipated goal Krieglmeier (2007). A survey conducted by the University of Calgary, Canada, reported that 80% of students felt frustrated during the conduct of the dissertation Hinshaw (1996). In Figure no. 3, out of the sampled population, frustration among UoM and SMIIT attendees reached 50.3% and 65.2%, respectively. Although frustration was not among the first top three problems, figures are once again quite alarming and thus require attention when developing the mobile application.

The survey tried to study the problems of *demotivation* and *overwhelming feelings* among the sampled subjects. From a university perspective, SMIIT (56.5%) students reacted more to the fact of *demotivation* being a problem than UoM students (49%). The contrary is true in the case the of *overwhelming* problem as students attending UoM gave more importance to this problem (47.7%) those attending SMIIT (30.4%).

Gamifying the Research Process - Table no. 5 shows that in total, 60.3% of the sampled subjects would like the dissertation process to be gamified. The remaining 39.7% were less inclined towards having a *gamified* process. Additionally, subjects were asked which gaming elements would they prefer to have if the dissertation process were to be gamified. Table no. 6 indicates students' preference to be leaderboards (41%), badges (40.9%) and trophies (38.9%) as these three gaming elements scored the highest frequency within the 4 - 5 (highest) ranking category. Figure no. 4 portrays evidence that students believe (86.3%) that gamification will help in the undertaking of the dissertation. Only a small portion of the interviewed subjects (13.7%) were against this idea.

		University		
		UoM	SMIIT	Total
		%	%	%
Rank	0 - 4	39.1	0.6	39.7
	5 - 10	59.5	0.9	60.3

Table no. 5 Gamifying the research process

Rank Groups				
	0-1	2-3	4-5	Total
	%	%	%	%
Leaderboards	19.5	39.6	41	100
Trophies	23	38.1	38.9	100
Social networks	21.7	40.4	37.9	100
Points	20.9	40.2	38.9	100
Levelling up	22.7	39.2	38.1	100
Badges	20.3	38.8	40.9	100

Table no.6 Ranking of gaming elements

Conclusion - It is evident from Figure no. 3 that the compilation of a dissertation may come at a cost. A busy schedule, lack of focus and frustration are few syndromes among many experienced by students undertaking a dissertation. Regarding these problems, scholars constantly suggest traditional solutions like taking frequent breaks, performing physical exercise, compiling a focused to-do list or even turning off WiFi Internet access. Although these methods have been tested and verified to work yet no scholar has ever ventured the idea of using gamification as a remedy for a *busy schedule, frustration, procrastination, lack of focus and demotivation*.

4.3 Mobile Application

The purpose of the mobile application is to provide a tool which harnesses gamification and HCI theories with the aim of providing a novel solution for legacy problems which may crop up during the dissertation writing process. The mobile application will address the problems of a busy schedule, overwhelming, procrastination, frustration and lack of focus.

Tackling the Busy Schedule Problem - A busy schedule will be tackled by analysing the user's calendar and providing suggestions of how the user can manage more efficiently unproductive time (UT) (e.g, commuting time). UT will be calculated along the lines of the following function:

$$\text{Unproductive Time (UT)} = \frac{\text{Free Time (FT)}}{\text{Busy Time (BT)} + \text{Sleep (S)}} \times 100 \quad (\text{Equation no. 1})$$

Once UT has been calculated, the user will be notified and guided on how UT can be harnessed and turned into actual production (e.g, reading a paper while commuting

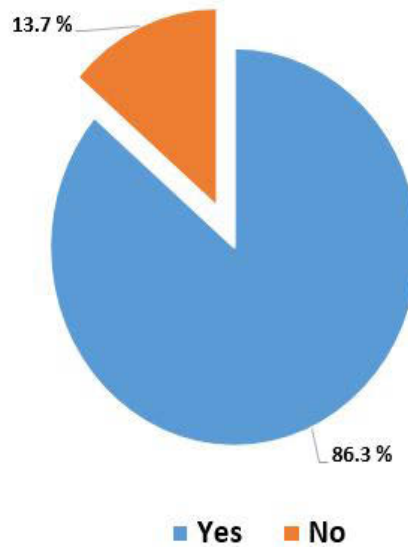


Figure no. 4 Percentage of students that are ready to continue their studies on a post-graduate level if the dissertation process is gamified

using public transport). The aim is to inform the user that in reality a busy schedule may be the product of UT which when eliminated will lessen other problems, like frustration pertaining to not meeting deadlines.

Tackling the Overwhelming Problem - The mobile application will use a progress bar to show the overall progress and thus reassure the user that the task at hand is manageable and that the user has the ability and the power to complete the task. Levelling up will be used to help users keep the required confidence.

Tackling the Procrastination Problem - Procrastination will be handled by bug-ging users about particular tasks. Once tasks have been accomplished, users will be given badges. The awarding of badges will be calculated along the following function:

$$\text{Awards} = \frac{1}{\text{Time to Complete task (TC)}} \quad (\text{Equation no. 2})$$

Such system will also help to increase motivation among users with the aim of reducing also frustration and the problem of not being able to focus.

Tackling the Lack of Focus Problems - The lack of focus problem will be tackled by showing an overall progress bar and by reminding the user about the positive progress performed. Constant reminders to work on tasks and suggestions on how to be more productive will aid in increasing the users's focus. Reassurance will also have a positive impact on focus, thus resulting in levelling up and the awarding of badges will indirectly help users to focus more.

4.4 Project Progress vis-à-vis Proposed Plan

Problems with regard to focusing and narrowing down the search, planning and deciding on the prototype have been encountered. However, with the help of the supervisor, such barriers were addressed immediately, allowing the project to progress in line with the plan. In fact, up until today, all stipulated deadlines have been respected without any exceptions or delays. Such momentum is expected to be maintained along the entire projects life cycle.

Chapter 5

Planned Work

5.1 Project's Current State

At this point, all deadlines set during Phase 0 and 1 were respected. Currently, work scheduled for the Phase 2 period is being conducted with the main task at hand being the development of the software. This task will last for eight weeks(62 days), which is the longest period in this entire project.

5.2 Planned Work

The way forward is to continue along the schedule presented in Chapter 4. Thus, in the upcoming weeks, work on the mobile application will be continued (until it is finalised), followed by the preparation for the launch of the second survey, the writing of the methodology and the writing of the results. Once Phase 2 has been successfully concluded, the project will move to Phase 3, where the discussion, conclusion and introduction will be produced. Phase 3 will be followed by the production of the video manual and finilising of the project including proofreading, printing and binding of the document. Phase 3 will last for approximately five weeks (32 days), and it will mark the end of the dissertation project.

Appendices

Appendix No.1 – Survey Gamification

1. What is your gender?

- ☐ Male ☐ Female

2. What is your age group?

3. What is your nationality?

4. What is the name of the course your are reading for?

5. Have you ever written a thesis or conducted a work of similar nature before?

- ☐ Yes
☐ No

6. How many hours do you spend working on your thesis on a daily basis?

0 hours 15 hours
7 hours

7. Which of the following problems (if any) are you encountering during the production of your thesis?

- ☐ Frustration
☐ Demotivation
☐ Procrastination
☐ Seems overwhelming
☐ Unable to focus
☐ Busy schedule
☐ No problems encountered so far
☐ Other

8. On which level would you like your thesis compilation to be as fun and engaging as playing a game?
(0 = not at all likely , 10 = Extremely likely)

Not likely at all Extremely likely

9. On which level would you like to have an application that for every step accomplished within your thesis project, trophies, ranks on a leader board, level up avatars, points and badges would be earned?

	Rank
Rank on a leader board *	⊗ ★ ★ ★ ★ ★
Post achievement on social network apps *	⊗ ★ ★ ★ ★ ★
Earn Trophies *	⊗ ★ ★ ★ ★ ★
Earn Points *	⊗ ★ ★ ★ ★ ★
Earn Badges *	⊗ ★ ★ ★ ★ ★
Level up Avatars *	⊗ ★ ★ ★ ★ ★

10. How many extra hours would you be willing to spend working on your thesis if thesis production would be as fun as playing games?

- ☐ 0
- ☐ 1-3
- ☐ 4-6
- ☐ 7-10

11. If thesis production would be made fun and easy, would it encourage you to continue your studies on a post-graduate level?

- ☐ Yes
- ☐ No

Appendix No.2 - Email Covering Text

Dear student,

If during this academic year you will be writing your thesis, I encourage you to read this email; otherwise, please ignore this email.

I am writing to ask if you are willing to participate in an online survey about *gamification* as part fulfilment of my B.Sc.IT dissertation.

Data collection will be held between **24.10.2013** and **07.11.2013**, both dates included.

Attached please find a document with questions and answers that should help you decide whether to fill in the survey or not.

Willing participants are to click on the link below

<http://www.surveygizmo.com/s3/1467531/Gamification>

Survey participation is 100% non-mandatory and participants can withdraw at any time.

Please feel free to address any queries that may arise to the undersigned.

Thank you for your consideration – your cooperation and contribution will be highly appreciated.

Appendix No.3 – Consent Letter

Dear Student,

If during this academic year you will be writing your thesis, I would appreciate your contribution through participating in a survey about *gamification*. The questions and answers below are intended to help you decide whether to fill in the survey or not. In case of further questions or clarification, please do not hesitate to contact the undersigned. Thank you for taking the time and consideration.

What is the research about?

The research aims to study *gamification* among students who are currently writing their thesis.

Why have I been invited to participate?

I am looking for participants to fill in a short web-based survey from which I can draw general statistics.

What will happen if I decide to fill the survey?

If you decide to participate, you will be provided with a link via email. The link will take you to the web-based survey, which is being hosted by *Survey Gizmo*.

How long will the survey take?

The survey is 11 questions long and it will take approximately 5 to 10 minutes to complete.

What about data confidentiality?

All data provided will be treated as confidential and it will be used by Jonathan Cassar solely for the purpose of this exercise. The questions in the survey are generic and in no instance will the survey ask for personal or confidential information. The analysis of the questionnaire will bear no identification to specific individuals and results will be aggregated for further confidentiality.

Can I stop half-way without completing the survey?

Yes. If at any time you would wish to stop filling the survey, you can and I will fully respect your decision.

What will happen with the collected data?

All data collected from the survey will be processed and a report will be drawn. The findings will then be submitted as part of a B. Sc. IT dissertation.

Who can be contacted in case of further questions or clarifications?

Jonathan Cassar is the interviewer of this task and may be contacted on +356 79283396 or jon.c.cassar@gmail.com

Appendix No.4 - Email Reminder

Dear student,

Re: Gamification Survey:

Just a gentle reminder to ask for your participation in the above mentioned survey. The survey deadline is due by **07.11.2013**. In order to be able to draw effective results I need as many responses as possible, thus I encourage you to follow the below link and complete a 5 minutes survey.

<http://www.surveygizmo.com/s3/1467531/Gamification>

Please feel free to address any queries that may arise to the undersigned.

Thank you for your consideration – your cooperation and contribution will be highly appreciated.

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