A Playful Mobile Digital Environment to Tackle School Burnout using Micro Learning, Persuasion & Gamification

Design Approach & Architecture

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Abstract— School burnout refers to exhaustion at school combined with a cynical and detached attitude towards school. It often precedes Early School Leave (ESL), which has great impact on the socioeconomic situation of a person. Numerous local programs exist to deal with school burnout and prevent ESL, but they are all very labor-intensive. To come to a less labor-intensive solution, we proposed an ICT solution. The goal was to create an engaging software environment that youngsters would use voluntarily and that could re-engage them in learning. We developed a so-called playful digital environment, called Tickle. It allows youngsters to collect digital cards by performing associated challenges in their surroundings. The challenges are small activities intended to reactivate the youngster for learning. Persuasive principles and gamification are used to motivate the youngsters to use the tool. In this paper, we discuss the design decisions that have been taken as well as the main components of the tool.

Keywords— school burnout, unconscious learning, playful environment, persuasion, mobile, location-based, personalization

I. INTRODUCTION

School burnout refers to exhaustion at school, a cynical and detached attitude towards the school, and feelings of inadequacy as a student [1]. It often precedes school dropout, also named Early School Leave (ESL) [2]. Early school leavers only qualify for jobs with lower earnings, which has great impact on their socioeconomic situation [3]. Therefore, the issue is high on the political agenda. Europe 2020 aims for reducing ESL to less than 10% [4]. Although Belgium has already met the 2020 target (in 2016, Belgium’s ESL average was 8.8%), ESL remains high in the Brussels Region.

Within the Brussels Region, numerous programs exist concerning school burnout and ESL [5], ranging from offering customized training projects and individual coaching, over time-out trajectories aiming to bring the student back into the classroom. Although valuable, these projects are very labor-intensive. To come to a less labor-intensive solution, in particular to deal with school burnout, we started a research project with the objective to develop software usable to reactivate and re-motivate youngsters suffering from school burnout. We developed a mobile digital environment that should stimulate youngsters to explore their environment in a meaningful and playful way.

To keep youngsters engaged, persuasive techniques and gamification are used. Note that the goal is not to replace school learning activities, but to reactivate students and increase their self-esteem.

In this paper, we motivate the main design decisions and principles used for achieving our goal. We also explain the main components of the system, as well as future work.

II. DESIGN DECISIONS

Literature studies were performed to investigate the state of the art related to the different aspects of the project. We investigated studies on computer and media use among youngsters in Flanders and Brussels, studies on school burnout and ESL, as well as on motivation and persuasive strategies as we want to stimulate the youngsters to keep using the software for a long period to induce behavioral change. The full reports can be found online: [6], [7], and [8]. Here is a summary of the main findings:

1) Computer and Media Use among Youngsters:

Youngsters appear to have good general computer skills and experience with the Internet. They also regularly share their own material online. They exhibit a clear preference for smartphones and are using them daily; tablets are used less. Therefore, we decided to adopt smartphones. The Internet is well spread and most youngsters do have access, moreover the availability of the Internet is only increasing. Therefore, we opted for an Internet-based application.

2) Early School Leave (ESL) & School Burnout:

ESL is a complex problem. A large variety of factors can play a role: the youngsters’ macro and micro environment, and individual characteristics. None of these factors are conclusive for explaining school burnout and ESL and therefore programs should rely on a wide body of information. For this reason, we will include an elaborated user profile to adjust to the situation and the individual.

3) Persuasion:

Fogg’s Behavioral Model [9] and Nir Eyal’s Hook Model [10] are frameworks on persuasion and behavioral change. Fogg’s Model offers three factors that determine whether a person will perform a certain behavior or not: motivation, ability, and trigger. Motivation can be distilled to three pairs of core motivators: pleasure and pain; hope and fear; and social acceptance and social rejection [9]. Ability relates to
III. DESIGN PRINCIPLES

In this section, we describe and motivate the main principles selected for the design of our solution.

1) Mobile 2.0, Unconscious & Micro Learning:

Through the use of mobile devices and social software, youngsters access, create and share content based on their own interests and those of their social networks [16]. This trend is called Mobile 2.0, and refers to the integration of Web 2.0 services (collaboration, communication and user-generated content) with mobile technology. It allows people to connect and create communities based on shared motives and common interests. These social, informal experiences are very often the foundation of learning [17]. Given our target audience, any form of school-related learning should be avoided because this will trigger negative emotions. Therefore, we aim for a form of unconscious learning [18] and Mobile 2.0 seems to be perfect for this.

Furthermore, we follow the principle of micro learning [19], where learning takes place with small chunks of learning content and flexible technologies enabling easy and ‘on the move’ access. This approach fits the characteristics of our youngsters and will make it easier to realize our goal.

2) Playful Environment

A playful learning environment (PLE) refers to a technology-enriched play and learning environment that blends indoor and outdoor spaces to create a playground for exploration, narration and imagination of information and knowledge [20]. The general goal is to advance the learner’s activity, self-directedness and curiosity by offering challenges and problems that take into account the individual characteristics of the learner. This concept is very suitable for our purpose. Therefore, we aim for a digital environment that acts as a playful interface to the manifold information available in the environment of the youngster and use these as a basis for unconscious learning.

Related to playfulness is the concept of gamification, which refers to the use of game elements in a non-game context in order to encourage and motivate users [21]. Because motivation is important for inducing change behavior, we will also apply gamification.

3) Personalized Approach

As pointed out, a “one size fits all” approach will not work. Therefore, a personalized approach will be applied, meaning that what will be offered, how and when, will be adapted to the needs of the individual user and will dynamically respond to the user’s behavior.

IV. TICKLE: MAIN MODULES

The main component of TICKLE is the Playful Environment. This is a mobile location-based application composed of a Cards module and a Diary. The Cards module displays a (geographical) map on which cards are marked (see Figure 1 - left) that the youngster can collect by performing the associated challenges when (s)he is nearby. Note that in the beginning and depending on the characteristics of the youngster, the challenges can be quite simple (e.g. taking a picture) in order to not demotivate the youngster, but more advanced activities are possible, like
performing a quiz or a small game. By collecting cards the youngsters can gather points that can be used to obtain rewards (variable). This card collection phase actually spans the action, reward and investment phase of the Hook cycle and will be preceded by the trigger phase taken care by the Notifier that will give the right triggers at the right moment. The Matcher is used to propose cards to the youngster. Both do this based on the user’s profile and the user’s activities.

In the Diary, the youngster can see his/her achievements and compare them with the achievements of peers (persuasive principle of social comparison). This Diary also implements the investment principle of the Hook Model.

TICKLE further provides an authoring environment for creating cards (Card Editor) and one for maintaining the users’ profiles and inspecting their progress (User Manager). Creating cards is based on templates and external learning authoring tools can be used for creating more advanced challenges like quizzes, or time line exercises. Currently, the BookWidgets tool [22] is integrated for this purpose. The User Manager allows professionals in the ELS domain to fill out and maintain the youngsters’ profiles. Also the activities performed by the youngsters, as well as the collected cards can be consulted through this module.

V. CONCLUSIONS & FUTURE WORK

We propose a playful environment to tackle school burnout, called TICKLE. It is a mobile, location-based application that offers youngsters an interactive environment in which they can explore their surroundings by performing small challenges in which they can explore their surroundings by performing small challenges and in this way learn in an unconscious way. We justified the design decisions taken, the principles used and discussed the main components of the system.

A functional prototype is available and different pilot evaluations have been performed. A longitudinal evaluation is being prepared. We also plan to allow youngsters to create cards themselves. This will contribute to the investments made by the youngsters but also to the fact that youngsters like to share their own materials online.

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REFERENCES