

## SHORT TERM SCIENTIFIC MISSION (STSM) – SCIENTIFIC REPORT

The STSM applicant submits this report for approval to the STSM coordinator

**Action number: CA16105**

**STSM title: User model in a gamified, intelligent and crowdsourced language learning environment**

**STSM start and end date: 12/08/2019 to 23/08/2019**

**Grantee name: Branislav Bédi**

### PURPOSE OF THE STSM

As the title of the STSM says, the aim was to continue working on the user model in a gamified, intelligent and crowdsourced language learning environment. Previously, a literature review of existing research was gathered which talked about intelligent tools in education, specifically games and applications for language learning. Based on this, an abstract of an article was written which included a brief introduction into the topic and then very shortly discussed the topic of edutainment and gamification. It was then put into the context of computer assisted language learning with gamified elements and AI. After that, the literature review helped to develop a user model, which consisted of the following elements: ID, EGO and SUPER EGO. The ID represents Initial Data (ID) – empirical and theoretical research allowing us the a-priori basic most general primitive assumptions about the user. The EGO represents Enquiry and Game Outcomes or Enquiry Generated Outcomes (EGO). Personal individual data acquired through explicit and implicit feedback. Both subjective and objective data and knowledge about the individual user. And the SUPER-EGO represents a group or crowd generated data (crowdsourcing). The different groups relative to the user could be as large as all users anywhere or as small as his immediate family of best friend or anywhere in between. It applies to the individual user because of his memberships in the various groups.

In order to expand on this idea and continue writing a longer article, more time was needed to spend together with the host in order to discuss topics and other research relevant to this work. The environment of the Robotics Lab at Ruppin Academic Centre offered a suitable working place where it was possible to use the academic facilities and concentrate on the work. In conclusion, the aim of the STSM was achieved because a sufficient time was spent on the above topic which helped to gather further literature references

### DESCRIPTION OF WORK CARRIED OUT DURING THE STSM

This STSM took place at Ruppin Academic Centre during 12-23 August 2019 (12 days) and the following work was carried out:

- Additional literature relevant to the topic of our user model was reviewed, which included articles from the subject of edutainment (education and entertainment), gamification, Computer Assisted Language Learning, crowdsourcing, language learning education, Artificial Intelligence (AI), and User Interface.

- Regular discussions about the setup of the article, its content, and revision of chapters;
- Meetings with colleagues of Dr. Rina Zviel-Girshin at the institute and introducing them our work;
- Attending two presentations of Dr. Rina Zviel-Girshin's students on their work done for crowdsourcing and language learning, and for crowdsourcing and tourism:
  - Amit Elia and Alex Raskin - *Educational gamified software for teaching how to read in Hebrew with content providing via crowdsourcing*;
  - Raphael Ben Eli and Amit Cohen - *SWAP Smart Walking Application - together with Cyprus open university*.
- Both presentations were very interesting, in particularly the one for crowdsourcing and language learning because it was relevant to enetCollect and our topic;
- The previously written abstract, which had already been presented at the ILAIS conference, was revisited and its chapters were expanded. Additional references were added to the reference list as well as the text was edited. After discussions, it was evident that some chapters could be merged in order to keep a clear focus of the article.
- A list of relevant journals for publication of our intended article was created.
- The article is in its first-draft stage. More editing needs to be done in order to achieve a satisfactory result. But this work will continue at a distance.
- The intention is to present the article at the next MC meeting in Spring 2020 and receive feedback from the enetCollect members.

The above points summarize an intensive work which had begun during the first STSM of the grantee to Ruppin Academic Center and resulted in an extended abstract, which was consequently presented at a local conference. As a continuation of our previous work, this second STSM was carried out in a similar fashion and resulted in compiling the first draft of an article which, as has already been advised above, will be presented at the next MC meeting of enetCollect. The second STSM has strengthened the collaboration spirit between the grantee and the host, and both are thinking about establishing a closer cooperation in some other international projects, which would involve both countries.

#### **DESCRIPTION OF THE MAIN RESULTS OBTAINED**

This STSM built on the results from a previous STSM. It expanded on the previously written abstract and the grantee achieved to write the first draft of an article based on research topics related to the abovementioned user model. This model addresses a challenge to describe the kind of users that occur in a crowdsourced language learning platform/application that has Artificial Intelligence (AI) features that learn about its users, whether it is a language learner or a content provider of either written (text) or spoken (voice recording) learning material, and language-related datasets. In this context, a befitting User Model (UM) with intelligent gamification elements plays a very important role. The first draft of our article structure is as follows: Introduction, review of language learning tools with crowdsourcing techniques, user structure in reviewed research, proposed user model (ID, EGO, SUPER-EGO), conclusion and future work. This proposed structure is subject to change and depends on revision and editing.

The work carried during this STSM contributed to the expansion of the existing literature review. Consequently, the list of scientific references about language learning tools with crowdsourcing techniques has expanded as well. Another shared online document has been created, which now serves to both, the grantee and the host, as an online working file.

The results of elements regarding crowdsourcing techniques and online language learning tools were added to the article draft. This serves as a basis for further analysis, which will show what kind of users are involved, what restrictions they have, for what purpose they are designed, and eventually how they interact with each other.

#### **FUTURE COLLABORATIONS (if applicable)**

During the STSM, the grantee attended two presentations of the host's students. One of the was particularly interested because it included the topic of crowdsourcing and language learning. Two students, who presented their work on developing an application, were invited to the upcoming joint WG3 & WG4 workshop on using LARA, which will take place at the University of Trnava, Slovakia, 27-29 November 2019. The students can bring a poster on the topic of Educational gamified software for teaching how to read in Hebrew with content providing via crowdsourcing and present their work in the workshop as well as take part in developing the LARA application, which includes crowdsourcing for creating online content. The envisaged future collaboration would be in the students' establishing contacts with other participants, but above all with the enetCollect members, and look for ways how to use their very successful class project so as to establish a more elaborated international collaboration with other enetCollect members.

Apart from the above collaboration, the grantee and the host are planning to continue work in this STSM. The idea is to have a Skype meeting between September and December, meet during the upcoming workshop in Trnava, Slovakia, and finish writing the article by the end of December. After that, another review process will start which will allow to present this article during the MC meeting of enetCollect in March 2020.