

DIAPLASIS: Development Of An Online School-Family Collaboration Platform For Intervention With At-Risk Students

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Abstract. Project DIAPLASIS (Greek Acronym for “Online Platform for School – Family Collaboration”) is a Doctoral Thesis aiming to develop an online system that allows collaboration between school and family, and to evaluate possible learning results in a two-year intervention with at-risk students. At least 9% of students in Cyprus are found to be at risk of failure in Language and Mathematics. Research has proved the positive results of educational interventions that include students and parents (family) on learning outcomes. The platform will be used for intervention with fourth grade at-risk students and to enable the active participation and collaboration of their parents.

Keywords: family-school collaboration, at-risk students, intervention

1 Introduction

The Ministry of Education (Cyprus) evaluates on a yearly basis student competency in Language and Mathematics (Third and Sixth Grade, Primary School) to detect at-risk students. It has been found by the Ministry’s Center for Educational Research and Evaluation (KEEA) that 9% of primary students are at-risk of illiteracy in Mathematics and Language [1]. Interventions using online tutors [2] and learning platforms [3] have shown great promise with at-risk students. Research has also shown the benefits of school-family collaboration, with a positive impact on learning outcomes and other problems associated with school life [4]. Even though interventions that include the family (usually only parents) are organized by schools (face to face afternoon meetings on weekly basis) are beneficial [5], parents from lower socioeconomic backgrounds, are usually absent from such events, mainly because of long and inflexible

working hours [6]. Even though tutors could be assigned to work with at-risk students, this is not the case with Cyprus, since usually no more than 1 to 2 periods (40 minutes each) are dedicated to each class on a weekly basis for helping students in need.

The main research question of this PhD project is: can an open-source based online platform be developed to be used effectively in an intervention in language studies in a primary school, to successfully help at-risk students that also offers a flexible solution for parent involvement? A secondary question that must be answered is: can this system, and the required technology (family computer) be of a significantly low cost so that even poor families can sustain it throughout the school life of their children (12+ years)?

2 Existing Knowledge

Research on the use of online platforms has shown positive results in learning [8], not only in Language but also in Mathematics [9]. Online solutions that offer information on student progress and allow families to communicate with schools have existed for many years either as commercial platforms (ie Pearson PowerSchool) or ordinary school web sites [10]. Other technologies like email, twitter, skype and sms messages on mobile phones are also used for communication with parents [11].

Research with primary students using learning platforms in both primary and secondary schools have shown the potential of such approaches (where teachers offer personalized training and tutorials to students, while offering constant feedback and information to the parents) [12], even when specialized content and tools are used [13]. Online platforms that allow teacher – family (students and parents) collaboration can offer an environment of personalized learning. Factors such as motivation have to be taken into consideration when designing interventions, in order to ensure that the student can be engaged in a personalized learning environment [14]. Evidence strongly suggests that such solutions can greatly benefit even at-risk students [15], especially when an e-tutor is involved and regular online meetings are arranged, including text and video between the tutors and the family (students and parents) [16].

3 Proposed approach and time frame

An online platform will be developed (Stage 1) and an intervention in the Language lesson will be implemented (Stages 2 to 5). A fourth grade class will be selected, based on a higher than average percentage of at-risk students (30%, compared to the country's average of 9% as evaluated by the Ministry of Education) for at least two school years. Families (students and parents) participating in the intervention will form the Experimental Group. At least 5 (fourth grade) classrooms from different schools that have been evaluated by the Ministry with at-risk students will form the Control Groups. The official evaluation of the Ministry of Education will be used as a pre-test. By the end of the first school year of the intervention, a post-test will be used with all Groups to evaluate (a) progress in Language studies for each class, (b) com-

parison of the change between the Experimental Group and the Control Groups. The intervention will require students to use written language to work with assignments delivered through a learning platform during school hours, (without excluding written assignments on paper), based on learning scenarios developed by the researcher. Social networking tools will be a part of the platform, to encourage and allow students to communicate with other students (from their school or other schools, excluding students from the Control Groups). Social networking will be based on a 'closed walls' approach to deny access to anyone except teachers and students from respective schools. Parents will be able to monitor the progress of their children, as well as information regarding school activities through the parent information portal of the platform. Online synchronous (video conferencing) sessions will be delivered to the Experimental Group at least 4-5 times a week, in small groups of 2-3 students or between a tutor and a single student and his parents (family) and for a duration that will not exceed a school period (40 minutes) for each session. Students will be able to watch recordings of their online sessions as many times and whenever they wish. The final platform will consist of four main components: (a) the Learning Platform based on an open source system such as Moodle, (b) a Parent Portal based on a content management system such as Drupal, (c) a social networking platform/eportfolio such as Mahara, and (d) a synchronous collaboration platform such as BigBlueButton. All components will be integrated into one platform with a common user interface.

The implementation and the development of the solution begun on September 2012 and is expected to be completed by September 2015. It is divided in five stages:

Stage 1: evaluation of infrastructure and initial deployment: An initial version of the platform was deployed with a simplified user interface customized for students [17] and parents and based on the Moodle platform. BigBlueButton was integrated to offer synchronous video conferencing capabilities. An initial pilot study was conducted in one primary school with participation from parents and students from three classes in two grades: One first grade class and two sixth grade classes, comprising of 49 students and 47 families (two families had students in both sixth and first grade). In this stage, a meeting was held at the school and parents were briefed on the possible benefits of the platform, its available tools for communication with the teachers and the features that will allow (in the first revision) even web-based broadcast of school events. During the first month of implementation, the vast majority of parents were constantly using the platform. However, there was a sharp decline in the use by sixth grade parents and only seven families from a total of 27 kept using it until February, in which case only one parent was visiting the platform on a bi-weekly basis (according to log data from the system). Parents from the first grade were and still are visiting the platform on a regular basis. From a total of 22 families in the first grade, 18 started using the platform almost immediately with a decline to just 11 families now visiting the platform on a weekly basis. The difference between the participation of parents of first grade students is attributed to the different nature of the two grades, according to 6 parents we talked with participating in the use of the platform, one of which is also the parent of a sixth grader and a first-grader: first graders cannot write notes regarding homework, therefore parents find it convenient to check online for the

teacher's notes (usually they are given a written notice on homework but students tend to forget it at school, lose it or in some cases- miss class due to illness and have no other means of finding out what occurred at school). Parents also expressed their satisfaction regarding the school announcements found on the home page of the platform, as well as the prospects of broadcasting school events.

Stage 2: Implementation of an Intervention in Language using the platform:

Between September 2013 and June 2014, an intervention in Language will be implemented with the Experimental Group. Learning Scenarios will require students to work during school hours on the platform to answer questions, write small essays, discuss topics of interest in forums and participate in synchronous chats with other students working on similar topics. Students will be able to continue their work at home (the researcher will make sure all students have internet access) in their own time and pace, while receiving feedback from their teacher even during afternoon hours through the platform itself. Students will be encouraged to use the Social Networking tools of the platform with other students to discuss their interests, form friendships etc. Research has shown the benefits of using social networking platforms, even with students with learning difficulties [18]. Families with obsolete or without computers will be given a number of low cost terminals connected to their televisions. Such solutions exist (Raspberry Pi, Android TV) that cost less than 50 euros and are capable of running a graphic user interface and basic applications such as web browsers, office applications and even educational games. Using observations with focus groups of parents, will allow the researcher to customize the user interface of these devices to ensure that all parents, even those with little to no computer using skills will be able to use the platform.

Stage 3: First Year Evaluation: Stage 3 (June 2014 – August 2014) will evaluate the change in learning in Language in all groups involved, using a Post-test. Change will be evaluated for each group individually, and a comparison will be made between the change in the Control Groups and the change in the Experimental Group. Changes, upgrades and optimizations of the platform will be performed, based on observations and interviews with students and parents, to identify and resolve technical and other issues.

Stage 4: Second Year Intervention (September 2014 – June 2015). During this stage, the intervention will continue for a second year with the same Experimental and Control Groups (Fifth grade). The results of the Post-test delivered during the previous stage will be used as the basis to evaluate change at the end of Stage 4. New scenarios will be implemented to motivate students to work with the platform and tools, and the same number of online sessions will be organized between teachers and families (students and parents).

Stage 5: Final Evaluation (June 2015 – August 2015). A final Post-Test will be delivered to all groups participating in the research. Change will be evaluated for each group individually, and a comparison will be made between the change in the Control

Groups and the change in the Experimental Group, with a detailed report on the results based on the initial (Pre-test) and the final Post-test. Based on the results, the impact of the platform in helping at-risk students will be evaluated.

4 Added Value

This PhD project is expected to offer significant advantages for school-family collaboration through an online platform that allows educational interventions in Language with at-risk students. It will also allow almost all parents to be able to communicate and collaborate with teachers to resolve behavior and other problems [19] as well as improve learning outcomes. The proposed system will allow parents with little to no experience and skills in using a computer to access online information regarding their children and collaborate with teachers or even participate in online school-related events. The use of the low cost computers connected to a television set can minimize the total cost of ownership of computers, and allow the government to promote such a scenario for a cost-effective introduction of one computer per residence. The Ministry of Education and Culture of Cyprus, which has given its approval for the implementation of the research, is also interested in the research since it might provide a solution for at-risk students. The low cost of the final platform, as well as the use of low cost terminals with a simplified user interface will allow its use with people with little to no computer using skills [20].

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