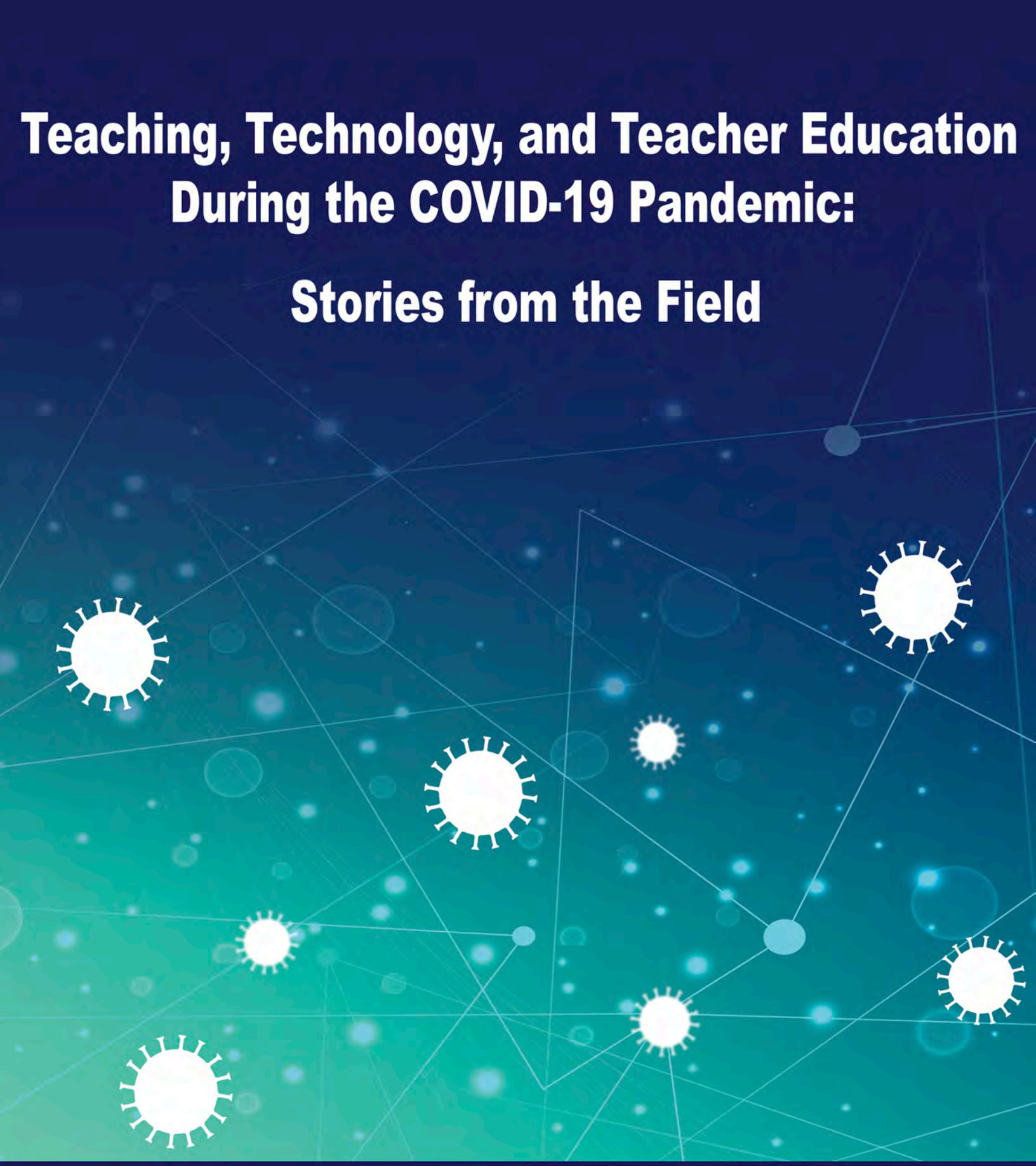
Teaching, Technology, and Teacher Education During the COVID-19 Pandemic:

Stories from the Field



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Digital Assessment for Learning – An Early Snapshot of the DADLIS Project

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One of the most powerful pedagogical techniques a teacher can employ is formative assessment i.e. Assessment for Learning (AFL). Formative assessment practices are methods of feedback which inform teaching and learning activities. DALDIS is an Erasmus+ Digital Assessment for Learning project. One of the project's key objectives is to assess the impact on student learning using technology enabled formative assessment which will be tested in six countries. This paper provides a snapshot overview of the projects initial pilot implementation in Ireland and some interesting and unexpected usage patterns in light of Covid-19. The need for teachers to acquire both assessment literacy and technology competences in order to utilise eAssessment systems effectively is also highlighted along with the impending implications for teacher training

Keywords: Digital Assessment for Learning; Data Analytics; eAssesment; Feedback; Assessment literacy; Covid-19; Erasmus+; STEM; Modern Foreign Language Learning

INTRODUCTION

The DALDIS (Digital Assessment for Learning informed by Data to motivate and incentivise students) Project is a three year EU funded Erasmus+ eAssessment Project that commenced in 2019. Led by Dublin City University, Ireland, and involving six European countries DALDIS is pilot testing and adapting a digital assessment for learning solution designed to drive students' learning progress using well designed question sets and student feedback. Assessment for Learning (AFL) or formative assessment using digital technology has great potential for teaching and learning (Maier, 2014; Russell, 2010) but is still in its infancy and not widely used in European classrooms. DALDIS is addressing this gap by researching the application of AFL methodology for Science Technology Engineering and Maths (STEM) and modern foreign language learning (MFL) using technology.

DALDIS is underpinned by AFL theory and educational technology. The project is built on the principle that formative assessment is one of the best methods to encourage student achievement (Hattie, 2009) and William and Black's (1988) definition of formative assessment practices as methods of feedback which inform teaching and learning activities. Good assessment practices are essential for learning and teaching and the increased use of technology in education has been demonstrated to improve assessment at various levels (JISC, 2007). However, the implementation of formative assessment in education has proven to be challenging (Birenbaum DeLuca, Earl, Heritage, Klenowski, Looney…Wyatt-Smith, 2015; Marshall & Drummond, 2006) due to deficits in both teachers' assessment literacy skills ((Doolin, Black, Harlen & Tiberghien, 2018, Popham, 2011) and technology skills. Teachers need to be assessment-literate and technology literate to effectively utilise eAssessment systems (Lee, Feldman & Beatty, 2012; Feldman & Capobianco, 2008). Research has shown that the role of assessment literacy in teacher education programs is limited (DeLuca and Bellara, 2013), that the successful implementation of AFL requires long-term professional development (Gottheiner & Siegel, 2012) and that greater investment is needed in teacher education to exploit the potential and usage of technology in the classroom (OECD, 2015; Stringer, Lewin & Coleman 2019).

INNOVATION

The backbone of the project is the Study Quest technology platform (www.study-quest.com) developed by one of the project partners. Its design has been influenced by Ireland's Revised Junior Cycle Curriculum, a 3 year programme aimed at 12-15 year olds. Ireland is the first country in the DALDIS consortium to adapt the Study Quest platform for

its curriculum. Known as JCQuest (www.jcquest.ie) this innovative resource comprises multiple choice question-sets derived from one of the core curriculum textbooks which ensures the assessment material fully aligns with classroom lessons. Similar adaptations, working models and curriculum aligned question-sets will be implemented for the other partner countries (Poland, Greece, Turkey, Denmark, UK) over the project's lifetime.

The Study Quest methodology is informed by assessment for learning research; in particular Hattie and Timperley's (2007) guidelines on feedback serve as the systems conceptual framework. A key feature of the project design is the use of carefully designed 'Feedback' for all questions that helps to 'nudge' students towards the right answer (figure 1), reinforcing basic knowledge and conceptual understanding, and effectively introducing and teaching the next concepts. Investigative questioning is supported through carefully designed questions to encourage students to research additional information working individually or collaborating to think through topics more deeply to find answers.

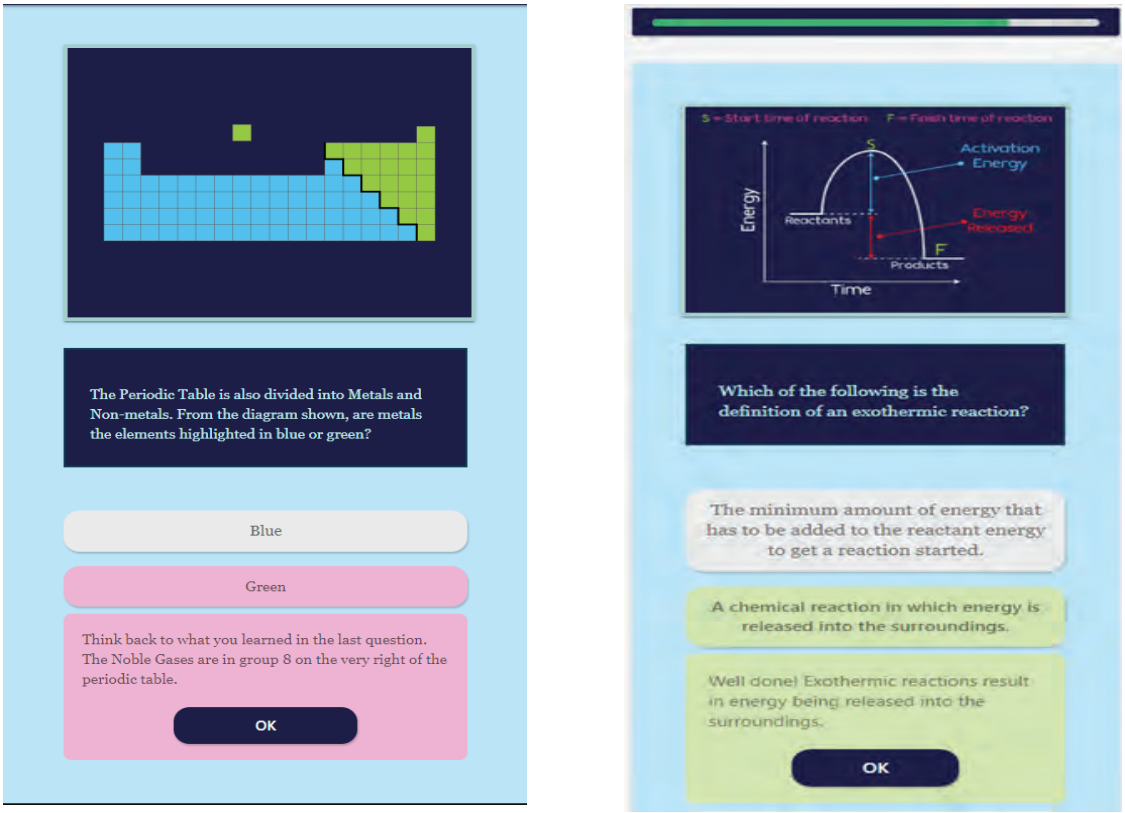

Figure 1. Feedback for RIGHT and WRONG answers Supports the student with positive 'nudges' in JCQUEST.

At a technical level Study Quest incorporates the most important elements of a robust eAssessment system including ease of use and accessibility, interoperability, security and effective feedback features to provide vital information to students and teachers. Importantly, it has been designed to support a variety of systems, devices, and browsers at school and at home (Tomasik, Berger & Mosser, 2018). It also provide functionalities to manage student assessment data such as background statistical information and analysis of student progress (Figure 2). Using Study Quest, a teacher can monitor student progress and assignments on an ongoing basis.

Figure 2. Data Supports the Teacher & Helps Drive Improvement in the Assessment Methodology in JCQUEST.

RESULTS

Pilot testing for DALDIS commenced with a soft launch of JCQUEST beta version in January 2020, followed by a more targeted promotion for teachers attending the CESI (www.cesi.ie) technology conference on February 29th. Initial take up was slow but when Covid-19 struck and schools abruptly closed on March 12th, there was a dramatic increase in usage as illustrated in figure 3.

Although just a snapshot this system generated data reveals a number of interesting trends. Firstly, there is a 5 fold increase in average weekly users from just 46 pre Covid-19 to over 200 post Covid-19, indicating that the system is fulfilling a need in light of school closures.

Figure 3. DALDIS Irish Launch & Covid-19 Emergenc.

Secondly, the most popular log in times are from 11 till 12.30, followed by afternoons between 2 and 4 pm. Another activity spike occurs between 6 and 8 p.m. which may be homework related. Thirdly, students spend an average of 45 minutes on each question-set which is evidence of good engagement. Fourthly, students are spending most of their time

using year 1 and year 2 materials. It is likely this is for revision purposes to help prepare for the upcoming Junior Cycle state examination as material from earlier years may be less well remembered compared to that covered in the current academic year. Finally, we have been surprised to see that the majority of students (51%+) are accessing the system using desktop computers rather than mobile devices Tablets in particular at 10% is very low. We are unsure if this is an anomaly due to students working from home as a result of Covid-19 or if the desktop experience offers a richer learning environment? Perhaps when schools re-open students will use their mobiles more as they access the materials while travelling between school and home or tablets if using the system during class? Also will the same usage patterns and device preferences be replicated elsewhere as the other partners adapt and test out the system? All interesting questions.

IMPLICATIONS

Although it is still early days in the DALDIS project and there is a lot still to learn and research, some early implications for teachers, teacher education and professional development include the following:

1. eAssessment systems like Study Quest have an important role to play in enriching teaching and learning and encouraging independent learning.
2. AFL with its emphasis on formative assessment is a powerful pedagogic tool as it enables the teacher to see how students are developing and how to assist their progress (Shute, 2009).
3. Effective feedback is central to AFL and has been identified in research as one of the most powerful influences on student knowledge and achievement. eAssessment that can generate immediate student feedback motivates learning and has the potential to support new forms of teaching and learning, in particular blended learning.
4. Worldwide, as digital technologies in schools become more prevalent alongside developments in evidence based policy making, involving increased accountability and standards based curricula (Thompson, 2017), teachers are coming under increased pressure to use AFL and technology more. Because many teachers feel unprepared for these assessment demands (Herppich, Praetorius, Forster, Glogger-Frey, Karst, Leutner… Südkamp, 2018) assessment literacy practices and technology competency need to be incorporated into initial teacher education (ITE) and continuous professional development (CPD).
5. In addition to ITE and CPD, the implementation and adoption of AFL and eAssessement systems like Study Quest requires effective leadership and a supportive school culture. School leaders can assist teachers' assessment literacy development by allocating time to work on creating AFL material (Ní Chróinín & Cosgrave, 2013) and becoming familiar with different tools and systems; opportunities for staff to work collaboratively and develop communities of practice should also be provided (Birenbaum, Kimron, & Shilton, 2011; Kay & Knaack, 2009).

While the design of DALDIS predated Covid-19, the surge in usage once schools locked-down indicates that well designed digital platforms which map directly to the curriculum can be valuable learning and assessment tools once teachers adopt them. Although DALDIS is designing for six specific national curricula, and is still a proof of concept project, many technology based tools for formative assessment already exist for teaching and learning such as Socrative, Kahoot, Plickers and RecaP. They are generally similar in their core functionality in that they provide instantaneous feedback about students' understanding of topics just taught. Teachers may also be interested in the Learning by Questions (https://www.lbq.org/) platform which like DALDIS is also curriculum aligned and contains 60,000 question sets. Teachers wishing to design their own curriculum specific question-sets containing functionalities like Study Quest such as integrated reporting, individualised feedback and advanced grading options, should consider using a combination of Google forms and flubaroo (http://www.flubaroo.com/), a free application add-on.

FUTURE RESEARCH

The DALDIS project runs until 2022. During this time question-sets similar to those in JCQuest will be designed for each partner country in line with classroom teaching practices and national curricula. The systems' innovative features such as the use of feedback 'nudges' to help students learn, gamification and incentives and data analytics for providing insights on effective questioning and student progression will be tested and researched. Furthermore, through working with schools and teachers the different approaches to curriculum in STEM and MFL teaching will be documented, and the effective-

ness of AFL in these contexts will be researched. This will help to develop a cross-European perspective on the design and implementation of a digital Assessment for Learning solution that will work across different education systems.

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