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Thematic Working Group 4: Digital agency to empower equity in education

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Introduction

In EDUsummIT 2017, Thematic Working Group (TWG) 4 is researching digital agency empowering equity in education. In order to do this, we will consider definitions of digital agency, we will identify projects and practices that positively support equity, and explore research identifying impacts of digital agency on equity in education. As will be seen from the brief literature review in the next section of this paper, an important element of agency concerns culture and interculturality, a dimension we intend to focus on. We will identify relevant projects from around the world, explore how they have tackled key issues, and what has been achieved. Examples we will consider include the Technology, Education, and Cultural Diversity (TEC) Center in Israel, the Global Classroom in Canada, and the Dissolving Boundaries Project in Ireland. Our ultimate rationale is to identify and recommend appropriate practices to teachers (including pre-service teachers) who support learners through onsite, online or blended approaches, across the 4-21-year-old age range.

In a world where digital engagement with learning is increasing, both onsite and online, it is important that concepts and concerns of digital agency are considered appropriately by policy makers and practitioners when they develop and implement provision for learners, locally, regionally, nationally and internationally. Our TWG4 work will explore definitions, practices and impacts, so that lessons might be gleaned for those working in both policy and practice domains.

This discussion paper has been developed specifically from and for the work of TWG4 at the EDUsummIT 2017 conference. It has been developed in its current form by the group leaders, integrating important contributions from members of TWG4 who provided responses to a short questionnaire prior to the conference.

This initial introductory section is followed by four further sections:

- Brief literature review
- Example case studies
- Key questions
- References

Brief literature review

TWG4 is taking a number of research approaches to explore the topic of digital agency to empower equity in education. Initially this concerns perspectives on defining digital agency. Martin (2004) defined learner agency (rather than digital agency specifically) as "the capability of individual human beings to make choices and act on these choices in a way that makes a difference in their lives" (p.135). Taking this in a digital context, this implies that digital agency is concerned with choice, with action, and with making a difference to an individual's life. In a later study, in an undergraduate student context, Lindgren and McDaniel (2012) asserted that "Computer technologies present new opportunities for drawing out and leveraging student agency" (p.346), concluding that "narrative and agency have complementary influences on processes of learning and engagement, and it lends support to the vision of interactive digital environments as nurturing human thinking and creative expression" (p.353). These authors are similarly highlighting the importance of digital technologies in enabling choice, action and making a difference to the work of the individual. Considering more the concept of levels of agency in learning activities, Schwartz and Okita (n.d.) differentiated factors that support high, rather than low, agency. They concluded that learning activities that support high agency are activities that are: student centred; with student voice; taking a constructivist approach; are active; involve doing; are elected; engage through intent participation; and where learners are in control. Choice, action, and making a difference are again embodied within the features they identify, but, looking in depth at features concerned with choice, action, and making a difference, as Starkey (2017) states, digital agency is: "The ability for individuals to control and manage their use of digital technologies and online presence. This includes managing identity, initiating interactions, using technologies for self-identified purposes and modifying or developing digital tools". These requirements for developing digital agency are very closely aligned with earlier conceptions of uses of digital technologies that are differentiated into 'consumer' or 'producer' activities and outcomes. The requirements and features that both Schwartz and Okita (n.d.) and Starkey (2017) identify are clearly associated strongly with 'producer' activities. However, there may well be an important role for 'consumer' activities that enables the development of learner understanding and features such as purpose, modification and development of digital tools, so 'consumer' forms of activities should certainly not be dismissed as being entirely unhelpful.

Developing purpose, modification and development of digital tools themselves may well require certain prerequisite background understanding and skills. As the OECD has stated, "Put simply, ensuring that every child attains a baseline level of proficiency in reading and mathematics seems to do more to create equal opportunities in a digital world than can be achieved by expanding or subsidising access to high-tech devices and services" (OECD, 2015). The fact that digital technologies are currently accessible through textual formats largely, whether linguistically or mathematically based, clearly places these as prerequisite understandings and skills. However, moving learners from agency with abilities in reading and mathematics to digital agency is not necessarily a focus of all practices or policies currently. As Starkey says, "While there is a strong belief among educational leaders in schools about agency empowering equity, this does not always translate into digital agency" (Starkey, 2017). The concept of young people readily possessing sufficient digital skills from social practices to undertake practices that are concerned with development of digital purpose, modification and development for learning is questioned. As Benett, Maton and Kervin (2008) state from their review, "While technology is embedded in their lives, young people's use and skills are not uniform. There is no evidence of widespread and universal disaffection, or of a distinctly different learning style the like of which has never been seen before."

Some studies have explored how digital agency might be developed through learner agency. Bjørgen (2010), for example, studied "examples of digital storytelling among 5^{th} – 7^{th} graders in three Norwegian primary school classes". The author concluded that "digital storytelling might represent a boundary crossing enabling pupils to adopt new roles as producers of creative content, as mentors or guides, to explore new technology and software in a context different from that of outside school and to learn and develop competences related to production processes and multimodal resources". Erstad and Silseth (2008) also point to the importance of digital storytelling in this respect, stating that they put "an emphasis on important issues in our education system today concerning the way we engage students in their own learning process by using the possibilities new technologies represent for expressing personal stories and facilitating agency".

With computing and computer science education currently being developed and integrated into curricula across increasing numbers of countries, the role of coding is an important concern in this respect also. As Corneliussen and Prøitz (2015) from their study in a rural code club in Norway state, "We find that coding through play activity is perceived as teaching more than simply the technical skills of programming. Although the fun aspect draws in children and volunteers, parents and instructors describe the code club as being about learning to understand and control the computer, and digital competence required for achieving success in society". However, they also conclude that "These arguments have different consequences for the gender imbalance at the Code Club. Our findings suggest that the code clubs need an explicit recruitment strategy targeting girls in order to become an arena where girls can develop interest and competence in digital technologies". The roles of intergenerational learning, and how this relates to learning and digital agency, are also touched on by this paper. And as de Almeida, Delicado, de Almeida Alves and Carvalho (2015) state from their study of uses of the internet by children in Portugal, "Our study suggests that the erosion of generational territory markers is underway through children's intense and ubiquitous use of the Internet".

Other studies have shown how digital agency has arisen from adult-focused projects managed within developing countries. For example, Coelho, Segatto and Frega (2015) state from a project in South Brazil that "The main result was the possibility given to the population to choose to connect and use ICT for their own benefit, in this use enjoying programs made available, often by Sudotec. Secondary results depend on individual choices, translated in this case as the possibility of learning new technologies, to include up in the workforce, to communicate virtually with others, to improve income in local commerce, either to contact with other cultures or by traveling". Similarly, Vaughan (2012) reports impacts of a project in Sri Lanka, aiming to develop societal improvement post-conflict, utilising the potentiality of digital technologies through government telecentres, a temple-based community ICT centre, and an e-village.

Some studies are pointing to the fact that digital activities are offering the potential for more intercultural social interaction. Even computing and coding are being considered in this respect. For example, Dezuanni and Monroy-Hernandez (2012) state that "The Scratch Online Community enables young people to share their creative digital projects internationally with a level of ease that was impossible only a few years ago. Like all creative communities, Scratch is not just a space for sharing products, work, techniques and tips and tricks, but also a space for social interaction". They conclude that "online community spaces like Scratch might draw on social interaction to enhance intercultural understandings and learning through dialogue and creative practice". However, in this context, Gudmundsdottir (2010) warns from her study of digital competencies of 7th graders in four schools in South Africa that "In order to increase digital equity and decrease the digital divide, a renewed policy focus is needed which puts greater emphasis on addressing the severe inequalities of the learners within their school environment as well as outside of school, taking their home situation into consideration to a greater extent". And Hatlevik and Christophersen (2013) in their study of over 4,000 students in 24 upper secondary schools identified the crucial importance of "The conditions at home, i.e. language integration and cultural capital, together with mastery orientation and academic aspirations did predict digital competence, and explained a substantial share of the total variation in digital competence."

It is clear from features above that an important element of agency concerns culture and interculturality (as cultural background may well affect ways that different individuals will engage with student-centeredness or being in control, for example). A number of projects worldwide have explored these issues in undertaking their practices: for example, The Technology, Education, and Cultural Diversity (TEC) Center in Israel; The Global Classroom in Canada; The Dissolving Boundaries Project in Ireland; Clusters of schools in New Zealand that aim to develop agency through the use of digital technologies, including Manaia Kalani; and a scaffolding approach first developed to support indigenous Australian learners. Braithwaite (2012) describes how he has achieved elements of digital agency for learners through his Global Classroom project, saying that "This student-driven content means the responsibility for what we will learn about other cultures rests with the class. As an instructor I give up a great deal of control over course content, but it is not a decision I have ever regretted". In terms of handling language and cultural interaction, Sierens and Van Avermaet (2014) propose that facilitating functional multilingual learning should be introduced as a new pedagogical approach to exploit children's plurilingual repertoires as didactic capital for learning, while the recognition of linguistic diversity at school should be regarded as added value rather than 'problem' or 'deficit'. Using digital technologies to support this approach, Van Laere, Rosiers, Van Avermaet, Slembrouck and van Braak (2017) describe the use of E-Validiv, a computer-based learning environment offering multilingual support in instructional and home language(s).

Example case studies

Name of the programme:
TEC – Technology, Education and Cultural Diversity

Country:
Israel

Vision:
The TEC Center develops and implements an online collaborative learning model, based on advanced technologies for lecturers, teachers, pre-service teachers and pupils from different ethnic groups and religions, yielding constructive dialogue and cooperation between diversified groups and eventually - tolerance and mutual respect.

Objectives:
To develop innovative educational models that bridge among cultures, using and applying advanced technologies; to train teachers from diverse cultural backgrounds to use the internet and other advanced communication technologies as teaching tools while becoming acquainted through collaborative small group learning; to develop online teaching units that encourage acceptance of the "other" and incorporate them in the curriculum in teacher education colleges and schools; to create an intercultural online community, comprised of the teaching staff of education colleges and schools; to generate ties among teachers, pre-service teachers and students from different cultures; to stimulate cooperative multicultural ventures among educational institutions and non-profit organisations, as well as with the Ministry of Education in Israel and in other countries facing multi-cultural challenges.

Target population:
Secular and religious Arabs and Jews in Israel that are: practicing teachers; pre-service teachers; and school students. It involved 3,000 pre-service teachers, 1,000 in-service teachers and about 20,000 pupils (during the years 2005-2017)

Approach:
The TEC programmes are implemented within small teams from diverse cultures, progressing from online dialogue (written, oral, video) to face-to-face interaction, in order to gradually develop trust between participants. Through online joint assignments over a period of at least one school year, team members get to know each other, develop mutual respect, eliminate stigmas and reduce mutual prejudices, thus becoming major agents of social change. The Center's work, and its proven impact, has received considerable praise in international conferences, and is regularly published and cited in both academic and popular journals. The Center is an autonomic unit within the MOFET Institute (NPO), receiving funding from other sources as well.

Name of the programme:
DB (Dissolving Boundaries)

Country:
Ireland

Vision:
The use of blended contact between schools to promote community cohesion on both sides of the border in Ireland has been a feature of education policy and practice for over thirty years.

Objectives:
Links between schools were formed on the basis of one school in Northern Ireland and one school in the Republic of Ireland. This decision was based on the proposition that younger children, and those in special schools in particular, were more likely to be able to develop effective working relationships if the number of partner children was based on one class linked to another class (Austin & Hunter, 2013). Its broad aims were to provide professional development for teachers in the use of information technology and to extend 'north-south' understanding.

Target population:
The DB programme involved 50,000 pupils in 570 schools supported by 2,600 teachers between 1999 and 2014.

Approach:
Teachers were invited to anchor the project work in topics that were already on their curriculum; and were given ownership of the choice of topics that were suitable for their classes. At a planning conference held early in the school year, the partnered teachers were given ICT training together, provided with possible venues for holding a face-to-face meeting for the children and requested to produce a planning agreement which outlined the intended work for the school year.

The choice of technologies, essentially Moodle and low-cost video-conferencing, was driven by the view that the DB programme should not be appropriated by ICT specialists in school but rather should be pitched at a level that was accessible to any and every teacher. This was felt to be the surest way for it to become sustainable. The technologies also provided asynchronous contact and potential for knowledge construction in a 'wiki' as well as real-time contact through video-conferencing. In other words, this particular mix of ICT had a good chance of working in a busy school day and was consistent with the DB programme's constructivist position (Austin, In press).

Two university schools of education ran the DB programme, Ulster University in Northern Ireland and Maynooth University in the Republic of Ireland. This meant that insights were rapidly disseminated to the staff and students taking initial teacher training courses and there was a natural synergy between the need to evaluate the programme and the universities' expectations for research output. It was found that teacher professionalism (in the context of collaborative learning), means displaying the right values, using craft knowledge to turn big ideas into realistic classroom practice and engaging in the kind of critical reflection which can get the best out of imperfect technology and adopt innovative ways of working (Austin, Smyth, Rickard, Quirk-Bolt & Metcalfe, 2010).

Name of the programme:
The GLOBE Program (connecting the next generation of scientists)

Country:
Global – it was announced by the US Government on Earth Day in 1994, and GLOBE launched its worldwide implementation in 1995.

Vision:
A worldwide community of students, teachers, scientists, and citizens working together to better understand, sustain, and improve the Earth's environment at local, regional, and global levels.

Objectives:
To improve student achievement across the curriculum with a focus on student research in environmental and Earth system science; to enhance awareness and support activities of individuals throughout the world to benefit the environment; to contribute to scientific understanding of the Earth as a system; and to connect and inspire the next generation of global scientists.

Target population:
The GLOBE programme involves students, teachers, and pre-service teachers from 117 countries.

Approach:
The Global Learning and Observations to Benefit the Environment (GLOBE) Programme is an international science and education programme that provides students and the public worldwide with the opportunity to participate in data collection and the scientific process, and contribute meaningfully to our understanding of the Earth system and global environment. GLOBE provides grade level-appropriate, interdisciplinary activities and investigations about the atmosphere, biosphere, hydrosphere, and soil/pedosphere, which have been developed by the scientific community and validated by teachers. GLOBE connects students, teachers, scientists, and citizens from different parts of the world to conduct real, hands-on science about their local environment and put it in a global perspective.

GLOBE is sponsored by the US National Aeronautics and Space Administration (NASA) with support from the National Science Foundation (NSF), National Oceanic and Atmospheric Administration (NOAA) and the Department of State. Internationally, GLOBE is implemented through government-to-government agreements with each country partner responsible for in-country activities. As the lead agency for GLOBE in the US, NASA has the primary responsibility for administering the government-to-government agreements, the management of the GLOBE Implementation Office, and the data and information system that support the worldwide implementation.

Key questions

From the discussion in previous sections, a number of key questions arise:

- In what way should we define digital agency for the purposes of exploring this area further?
- How might the development of digital agency be conceived across the lifespan?
- What factors currently might affect this, and what others might arise over time?
- What examples of developments of digital agency focusing on equity can we use as possible models?
- How is culture currently accommodated within the development of digital agency, and how might this change in the future?
- What roles should computing and coding play in intercultural development and digital agency?
- Do gender issues need to be considered and addressed?
- How can digital technologies support intercultural development and digital agency with respect to multilingual approaches?
- How can digital agency empower equity in education, in the world, in developing countries, and in cultures in conflict?

We intend at the EDUsummIT 2017 conference to focus on these key questions to further develop our understandings of this topic and to add detail to this field and to the debate.

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