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Smart Partnerships in Education: what are they?

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Abstract: This paper which arises from EDUsummIT 2015 provides an overview of the development of a working definition of Smart Partnerships (SP) in education before describing and analysing three potential SPs of which only one is identified as a SP. Further research and development of SPs are recommended to further understand SPs and to unleash the potential of digital technologies in education.

Introduction

As part of its commitment towards inclusive and equitable quality education and lifelong learning for all, UNESCO has recognised the need for 'Smart Partnerships' (SPs) among education stakeholders "to create equitable, dynamic, accountable and sustainable learner-centred digital learning ecosystems" (Incheon Declaration Education 2030, 2015). In line with its 2030 education agenda, UNESCO also calls for further consultation and dialogue between governments and the private sector to design scalable innovative funding mechanisms that will secure the financial resources needed to unleash the full potential of digital technologies and ICT for learning ([Qingdao Declaration](#), 2015).

Despite this, there is little knowledge and understanding of the concept of Smart Partnerships in education. For this reason, a working group at EDUsummIT 2015 responded to UNESCO's invitation for a brief on research into Smart Partnerships. As part of its work prior to, during and after EDUsummIT, the group defined, illustrated and discussed Smart Partnerships in Education. This paper presents an overview of the conceptual development of a working definition of Smart Partnerships, followed by a brief illustration and comparison of three case studies from India, Malaysia and Slovenia.

Review of literature

In an effort to meet the challenge of identifying literature relating to SPs in education, the scope was expanded to consider the terms 'smart' and partnerships more generally in ways that were relevant to the development of schooling and digital technologies in education. Literature on public-private partnerships, multi-stakeholder partnerships, ICT partnerships and partnerships in education was accordingly examined.

Smart

Commonly quoted aspects of 'smartness' include smart economy, smart mobility, smart living and smart environment. Implicit in these terms is the deployment and intelligent use of digital technologies to transform systems, operations and service delivery. For this reason, literature relating to 'e-government' and 'smart cities' proved useful towards explicating the concept of 'smartness'. For example, e-government refers to the use of a range of digital technologies by government agencies to improve the efficiency and effectiveness of public sector organisation to the benefit of citizens, businesses and the government itself (Heeks, 2001; eGovernment for Development Information Exchange, 2008; World Bank, <http://go.worldbank.org/M1JHE0Z280>). Similarly, the concept of 'smart cities' focuses on transforming traditional infrastructure components and services, including education, through the intelligent use of digital technologies (e.g. <http://ec.europa.eu/eip/smartcities/>, http://www.ibm.com/smarterplanet/ie/en/smarter_cities/overview/). It entails the development of more intelligent and innovative spaces where people live, work and learn. In both contexts, the use of digital technologies goes beyond use for simply improving existing processes and infrastructures. Rather, it involves rethinking and transforming the ways governments and living spaces operate.

Partnerships

Whereas public-private partnerships are generally understood as joint government (including intergovernmental organisations) and for-profit or commercial initiatives, multi-stake holder partnerships generally refer to partnerships that bring together a wide range of public, private and civil society stakeholders. According to Draxler (2008), such partnerships have been created for the purpose of advocacy, pooling resources, exchange of expertise, or for developing new ways to construct or to provide infrastructure and services. Thus, they are seen as complementary mechanisms that can provide enhanced expertise, synergies, resources and responses to needs. In Education, they are seen as a way to obtain a greater involvement of the private sector to improve and strengthen education systems and infrastructure (Education International, 2009). For example, as cited in Phillay & Heane (2009), the experience of Organisation for Economic Co-operation and Development (OECD) countries shows that PPPs can play a vital role in mobilising the scale of resources required for developing ICT infrastructure, applications and locally relevant content, and the human capacity required for harnessing the full capacity of ICT (Ichiro and McNamara 2003).

Although the research evidence of the impact of PPPs and MSPs is limited, some success indicators were identified across a small number of studies. The work of Cassidy (2007) identified the need for successful partnerships to: involve a much broader set of stakeholders in education reform than has typically been the case, share a coordinated strategy for education reform and change, invite partners into the dialogue about both the substance of the reform and how change might/should happen and share a commitment that all partners can and should gain value from their participation in the partnership. Similarly, in their review of ICT for Development (ICT4D) partnerships, Geldof et al. (2011) stress the importance of a shared strategic vision across partners which should include local community partners. They also note that sustainability and scalability of the intended development intervention need to be built into partnership design at the very beginning and that a supportive wider ICT environment needs to be in place, both in terms of policy and infrastructure, if such partnerships are to flourish and deliver effective development outcomes. Finally, Grobe's review (1990) review of industry-education partnerships was also found to be useful. Through her analysis of such partnerships three typologies were identified: (1) levels of involvement that also describes the maturing as partners engage more deeply with one another, (2) the partnership structure, and (3) the level of impact of the partnership on the education system. Although a little dated, they draw attention to the relationship between partners and the structure of these relations over time. They also emphasise the partnership's impact on the educational system i.e. how educational change can be brought about by the partnership.

Smart Partnerships as a way of providing of technology enhanced learning for all

Longitudinal research of schools evolving with digital technologies has also identified a number of supportive factors needed to retain innovative practice with ICT. These include "the schools' cooperation with external partners, the intra-school cooperation, the development of concepts to cope and to re-act to new digital trends and the overall radius of operation to cope with problems on the process level. (Eickelmann, 2011).

Leaders of schools and other educational organisations also have an important role in facilitating change through the use of digital technologies in learning. However, they cannot bring about effective change without involving others, and often they are not the key people to initiate it. Fullan and Langworthy (2014) also recognise that digital technologies frequently present complex problems for leaders in educational organisations. They note that it is essential that leaders have a clear vision regarding the use of digital technologies to not only support learning but also for how ICT can be deployed in ways that transform learning; realisation of this vision is likely to involve external partners. Hence, the need for a better understanding of Smart Partnerships in education, to ensure that the potential of digital technologies to enhance learning for all those involved in the schooling sector is maximised, in ways that increase digital equity.

Methodology

The conceptual development of Smart Partnerships reported in this paper entailed a number of discrete stages in addition to an ongoing review of relevant literature.

In year preceding EDUSummIT, potential Smart Partnerships were identified and explored by members of the working group. The illustrations were purposefully developed to be wide ranging, including provision for

learners, teachers, administrators, service providers, agencies in both school based and out of school provision. Initial analyses of these examples suggested that Smart Partnerships include the following key elements:

- Synergetic complementary contributions from partners, whom have clearly defined roles and responsibilities,
- A vision that both embraces a shared understanding across partners of how educational change can be brought forward by the partnership and is future focussed
- Alignment between the defined goals and the paths undertaken to reach them
- Metrics that are used by the partners to keep the initiative on track and build sustainability
- Resilience so that the partnership is sustained
- Technology access is improved for equitable purposes, including reduction of the digital divide

Three potential illustrations of smart partnerships were then selected for further analysis and description at EduSumMIT 2015. The Arena of Change with Digital Technologies in Education (Davis, 2008) was used as a tool to critically analyse and describe these partnerships. It served not only to identify the partners and organisations involved in each partnership but also to clarify the interaction between global and local educational ecologies on four main axes: political, bureaucratic, professional, and commercial (including open educational resources).

Figure 1 presents the arena at the centre of which is a distant teacher viewed through digital technology by students located in different schools and/or homes. This virtual classroom is nested within larger ecologies of the school, the region, the nation as well as a global perspective.

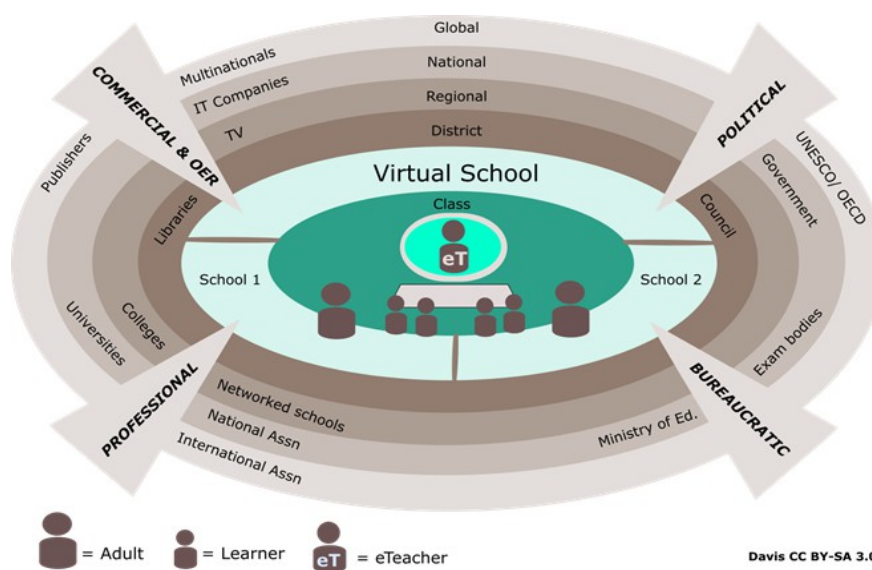


Figure 1. The global arena of change with ICT in schooling showing a distant teacher working with students in at least two schools, as well as the ecosystems within which a teacher enabled by ICT is nested at the centre (from Twining et al, 2015, p.6, CC by SA with permission).

Smart Partnerships defined

Stemming from the descriptive and analysis phase, it was determined that Smart Partnerships in education have most or all of these seven characteristics:

1. include partners within and across education (including teachers, their organisations, and researchers), government (of education, commerce & law enforcement etc.), industry, communities, and civil society (e.g. NGOs)
2. have a shared purpose (values, concept vision) that evolves into a synergy (more than a sum of the parts)
3. have a strategic and holistic approach

4. enhance the quality of education with digital technologies (ICT)
5. harness ICT smartly (e.g. evidence immediately deployed to improve performance)
6. recognise their role in the emergent process(es); and
7. facilitate their own organisations to change.

Smart Partnerships can thus be defined as follows: *A Smart Partnership (SP) in education has partners within and beyond education with a shared purpose. Such partnerships evolve into a synergy of strategic and holistic approaches to enhance the quality of education with digital technologies, harnessing that technology 'smartly' both in relation to learning and supporting the partnership itself. In addition, all partners recognise their role in the emergent process and facilitate their own organisation to change in ways that may sustain and scale the SP.*

It is also noted that a Smart Partnership may include one or more smaller Smart Partnership(s) within it.

Illustrations of Smart Partnerships

The three illustrations of potential SPs:

- India: Integrated ICT in schools and communities in rural and remote regions. Key informant was Amina Charania.
- Malaysia: MARA SmartEdu Partnership. Key Informant was Hasniza Nordin.
- Slovenia: OpeningupSlovenia. Key Informant was Davor Orlic.

India: Integrated ICT in schools and communities in rural and remote regions. In India, the Integrated approach to Technology in Education (ITE) is an initiative of the Tata Trusts in twelve mostly rural locations in Eastern and Northern India. Initiated in 2012, the central concept of ITE is to integrate digital technologies into the curriculum and instructional plans of schools and other learning centres participating in the initiative (Charania, 2012-2014). Adopting a largely constructivist pedagogical framework, the approach seeks to improve teaching and learning processes and foster authentic and project based learning for the older children and adolescents in some of the most underprivileged geographies in India. Projects are carefully designed by teachers to match the curriculum and lessons currently taught in the schools. Thus in this approach, teachers design learning activities and students use technology to create learning artifacts demonstrating construction of their own learning. For example, students use technology for seeking information, to construct and organize their learning and to represent it through projects created through computer applications. The students, mostly first time computer users, create learning artifacts such as weather charts, jute production in India, or population density in different cities to deepen their learning of content in the school syllabus. In this way, technology rather than an additional layer in the classroom is embedded within the design and pedagogy of the teacher's lesson plan and curriculum (Charania, 2011).

The Arena for the ITE SP in India is sketched in Figure 2. At the centre is a community learning centre for adolescents and a public school in which trained co-ordinators and teachers to implement ITE. These are nested in clusters of villages at district level in which parents, committees and their leaders are central stakeholders for implementation and at state level by the NGO who hosts partnerships between district authorities and the Tata Trusts. The interaction between global and local ecologies is plotted on the four main axes: political, bureaucratic, professional and commercial. The political axis includes the state party and national party while the bureaucratic axis identifies the State ICT report and State text books at state level with the Ministries of Education and Human Resource Development (MHRD) at national level. UNESCO lies at the intersection of the political/bureaucratic axes. On the professional axis are Tata's Institute of Social Sciences and the external evaluators of ITE at state level. At global level are Massachusetts Institute of Technology, International Society for Technology in Education (ISTE) standards, Professor Niki Davis and the interns from the University of California in Berkeley. The Tata Trusts are positioned at the intersection of the professional/commercial axes and the NGOs (e.g. Suchana, GVMO) at commercial/political axes intersection. Companies such as Google are present on the commercial axis.

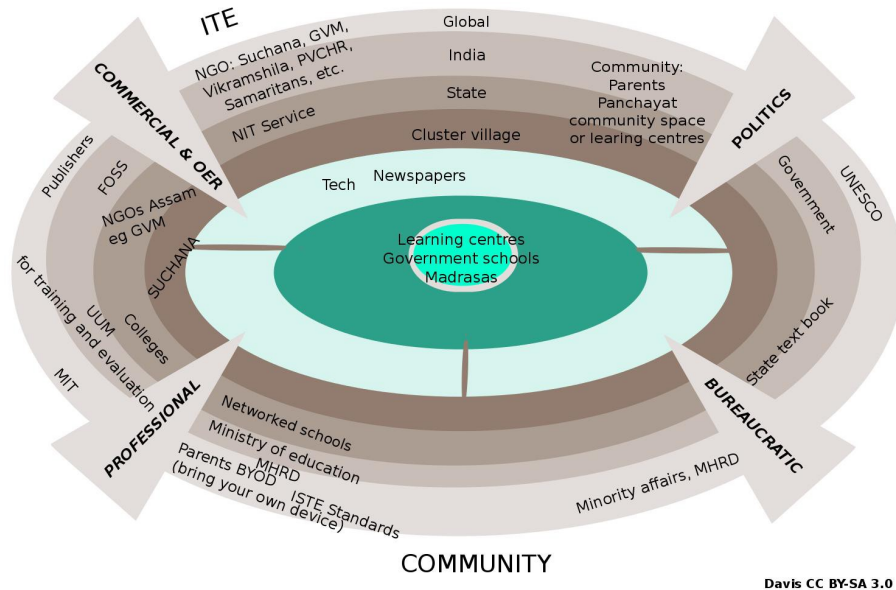


Figure 2. Arena map of ITE

Malaysia: MARA SmartEdu Partnership. The Malaysian education system is highly centralized with a ‘top-down’ approach in which each school follows the same curriculum, policies and teaching programmes. Two different agencies manage schools: the Ministry of Education and the MARA agency (translated as Council of Trust for the People) which is under the Ministry of Rural and Regional Development. National policy in Malaysia articulates a vision to transform schooling in Malaysia, and to reduce the digital divide between urban and rural students by providing quality Internet-enabled education to all schools throughout Malaysia (Ministry of Education Malaysia; 1998, 2012).

In 2014, 12 MARA Junior Science Colleges (also known as Maktab Rendah Sains MARA (MRSM)), were selected for an innovative approach to schooling called ‘Learning Powered by Technology’. As part of the initiative, all 12 MRSMs were provided with the infrastructure (<http://www.smartedu.my/>) to facilitate use of technology in the MRSMs for administration, learning and teaching. This included high speed wireless connectivity, full solution architecture design; content repository and cloud computing through the nationwide online platform (see [Nordin & Davis, 2015](#), page 72-74). A programme of professional development for teachers in the MRSMs was also implemented and co-ordinated by teacher educators at Universiti Utara Malaysia (UUM). The programme was pedagogically and content driven although technical training was also provided. A two pronged approach was adopted whereby two or three teachers from each MRSM, selected as ‘change ambassadors’, were provided with ongoing professional development. These change ambassadors subsequently had responsibility for professional development at their school and also supported teachers in the use of the SmartEdu platform at school. For their part, each teacher created a course for their subject area in which they embedded a range of digital activities. They then uploaded the learning materials, activities, quizzes and assignments designed as part of this course onto the SmartEdu platform. Representatives from each MRSM showcased the process and outcome of the SmartEdu implementation in their classroom at MARA Smart Education Summit in November 2015. Teachers were also required to become a member of Microsoft Educator Network and participate in a Microsoft Innovative Educator programme.

The Arena for this potential SP in Malaysia is sketched in Figure 3. Further analysis of this multi stakeholder partnership will be necessary before all seven characteristics can be confirmed as present or absent. Our current analysis suggests that this is not currently a SP, but it could grow to become one. The map sketched in Figure 3 places a teacher in one classroom of one of the MRSMs at the centre of the map, with other classrooms in the school behind her. It represents one of the 12 MRSMs in Malaysia. The interaction between global and local ecologies is plotted on the four main axes: political, bureaucratic, professional and commercial. On the political axis are politicians who sit on the MARA board while the Ministry and MARA agency is positioned on bureaucratic

axis. UNESCO lies at the intersection of the political/bureaucratic axes. The Universiti Utara Malaysia (UUM) as designers of the professional development programme is placed on the professional axis. On the commercial axis is range of providers that support Smart Edu. Telecom (TM) (wireless network) and Content Capital (learning platform) are present at national level, plus Microsoft at the global level (MS Educator Network and the Innovator Educator program (<https://www.educatornetwork.com/>)).

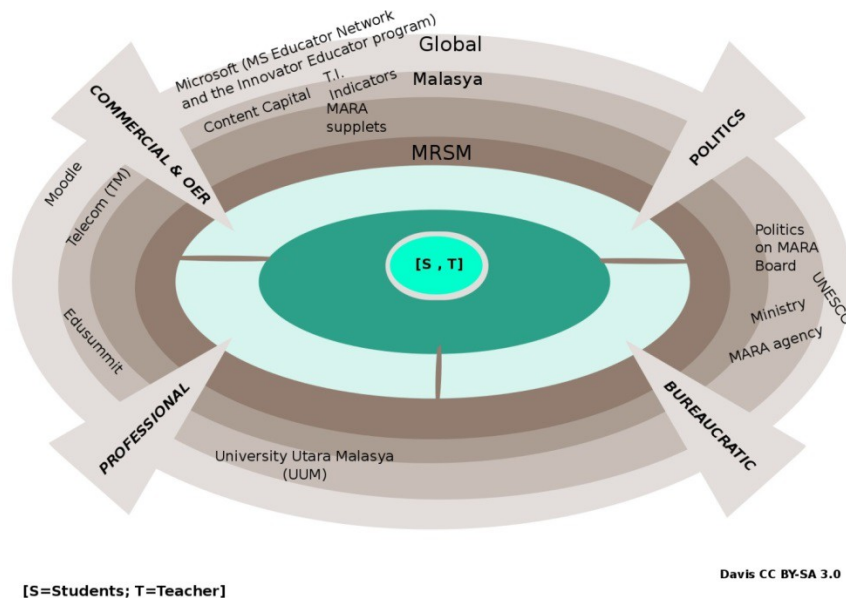


Figure 3. Arena map of Smart Edu

Slovenia: OpeningupSlovenia. In Slovenia, OpeningupSlovenia (OuS) was established in 2014 as a way to promote ways of learning and teaching through ICT and digital content, mainly through the development and availability of Open Educational Resources and Open Technologies for OER and Open Learning. Supported by national policy and driven by research, this is top-down/bottom-up initiative is a partnership of 11 institutions across all levels of the Slovenian education system i.e. HEI, compulsory, vocational education and training, lifelong learning institutions and companies (see [OpeningupSlovenia](#), 2014). As part of the initiative, partners across OuS work together to design and implement innovative projects across a range of educational settings and which make use of cutting-edge ICT technologies (also based on Artificial Intelligence and Big Data) and theories in open education. The projects are intended to create opportunities to innovate for organisations, teachers and learners, to help participants acquire digital skills and develop new ways of learning as well as to support development and availability of OER and open data. There are currently 27 projects running, each of which involves a different set of partners from across the education system. Examples include:

- ‘My Machine Project’ (My Machine Slovenia <http://mymachine.si/>) in which children from kindergarten and primary schools design their dream machine, higher education students propose one or more solutions to design those machines and the best solutions are then selected by the children before a prototype of the machine is built by Technical Oriented Secondary Schools students. Partners in the project, which is also linked to the global ‘My Machine’ project (My Machine Global <http://www.mymachineglobal.org>), include the Institut Jozef Stefan, Ljubljana and OS Savska naselje.
- TraMOOC is a H2020 project started in 2015 to develop high-quality translation of all types of text genre included in MOOCs (e.g. assignments, tests, presentations, lecture subtitles, blog text). This online translation platform will provide translation into English into eleven European and BRIC languages (DE, IT, PT, EL, DU, CS, BG, CR, PL, RU, ZH). Partners include universities, research organisations and industry. (see <http://www.ouslovenia.net/project/tramooc/>)

A UNESCO Chair on Open Technologies for Open Educational Resources and Open Learning at the Institute in Ljubljana, Slovenia was also established in 2015 to link this emerging SP with that global network of OER leaders.

The Arena for this potential SP in Slovenia sketched in Figure 4 indicates the pivotal role of research projects involving students (S), teachers (T), researchers (R) and policy makers (P) who are placed at its centre. The interaction between global and local ecologies in this national initiative is plotted on the four main axes: political, bureaucratic, professional and OER. On the Political axis the partners include research institutions together with UNESCO, the European Commission, and a federal agency in the USA, all of whom feed into policy adoption in Slovenia. The Slovenian Ministry of Education and the European Commission are identified on the Bureaucracy axis. The professional axis includes some of the partners who are currently involved in the initiative: K4A Foundation, MIT, Stanford, CERN, and 60 Artificial Intelligence labs whose central actors (S and T) 'feed' with Technology Research (data). On the OER axis are European Commission supported technology (data) and other research projects that are developing practice in Slovenian schools and other educational contexts. Open research methodologies are placed on the professional/OER intersection.

Further analysis of this multi stakeholder partnership will be necessary before all seven characteristics can be confirmed as present or absent. Our current analysis suggests that it may be an emerging SP.

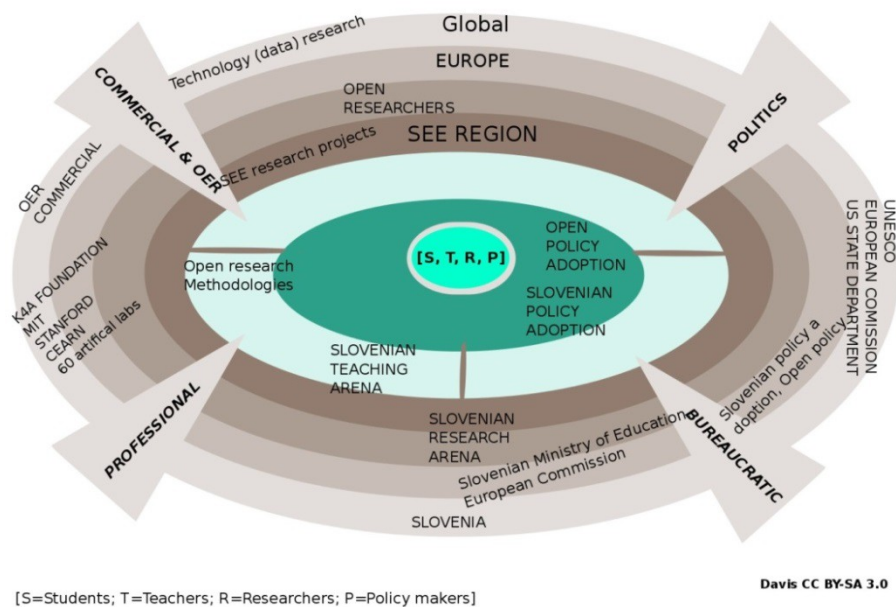


Figure 4. Arena map of OpeningupSlovenia.

Characteristics of a Smart Partnership

The three illustrations of an SP and two potential emerging SP have provided the opportunity to begin to generalise a description of the characteristics of a SP. These are presented below in the same order as given in the definition of a SP above.

- **Smart Partnerships have partners within and across education government, industry, communities, and civil society.**

As seen in Figures 2, 3 and 4, each of the partnerships described have partners within and across education, government, industry, communities, and civil society. For ITE (Figure 2), the multi-stakeholder partnership evolved strategically and holistically over time as the intervention matured and mainstreamed in the public system. The key stakeholders in the first year of the initiative when it was implemented across four learning centres for adolescents were an NGO and the Tata Trusts (see [Charania, 2015](#); p. 64-67). The initiative was scaled up in the

second and third years of the programme, increasing the number of the NGOs adopting the program from 1 to 18 and the number of young people participating increased from 1000 to 22000. Partnerships were also established with State and education district departments as interest grew in adopting the programme developed in public schools. These partnerships led to the Tata Trust working with the teachers, schools and district education authorities to integrate ITE approach inside public schools. As part of this mainstreaming into public schools, local communities comprising of parents, village committees and heads, and youth forums were also part of the partnership and remained important stakeholders for implementation on ground with the NGOs. Finally, higher education and related professional networks are also important partners in the ITE initiative and those global networks have expanded over time. The leader of ITE conceptualized the initiative based on her graduate studies and teaching experience at Iowa State University and has continued the partnership with her doctoral supervisor. Partnerships have also been established with the University of California Berkeley Industry partners include Google and telecom providers.

MARA EduSmart (Figure 3) comprises a partnership across government, education, business and industry. The ministry (MARA) plays the role of main provider who has overall responsibility while the other partners provide the services and resources to the MRSMs. Telecom (™) and Microsoft provide the technology facilities for SmartEdu in the MRSMs while an e-learning company, Content Capital, and university teacher educators (including Nordin) provide the professional development. The MRSMs are also active partners in that the change ambassadors and teachers work together to implement the initiative on the ground with students and parents.

OpeningupSlovenia (Figure 4) is multi-layered partnership across government, education and industry. At the top layer, SoU is a government supported partnership of 11 institutions across all levels of the Slovenian education system. Within this larger partnership are a number of smaller partnerships; that is each of the projects supported by SoU can be considered a partnership in its own right. Each project has a different set of partners from across the education system including researchers, teachers and students. Some projects (e.g. TraMOOC) also have partners from the international education community (e.g. the TraMOOC project has partners across a number of European universities). Orlic notes that a range of partners from industry are included across the projects.

Each of the three examples described thus provides ample evidence of partnerships within and across education government, industry, communities, and civil society in each of the partnership. They also serve to highlight the complexity of the organisation or the structure of these partnerships. Drawing on Grobe (1990), these partnerships are complex because they have multiple partners, often with more than one partner from each sector and each partner has substantive responsibility within the initiative. There are also two or more levels of partnerships in each of the projects. What is also noticeable is that the structure of the ITE initiative partnership is not static but rather has it has continued to evolve as the partnership expands and matures. This suggests that smart partnerships have complex dynamic structures.

- ***Smart Partnerships have a shared purpose that has evolved into a synergy with a strategic and holistic approach.***

There is a shared purpose across partners in each of the three initiatives as they each work towards a common goal. The purpose of the ITE programme for example, is articulated as a set of four key objectives and strategies which broadly relate to enhancing educational outcomes and bridging the digital divide among students in disadvantaged settings. These objectives and strategies are the key focus of initial workshops and events in which new partners participate. Similarly, SmartEdu, is grounded in a set of four broad aims which relate to enabling teachers to use digital technologies to support learning and teaching in their subject areas. These aims are operationalised through the provision of the online platform and centralised programme of professional development that is provided. In both ITE and SmartEdu, this approach has not only led to a shared purpose among the partners in ITE and SmartEdu but it supports implementation on ground and most importantly, preserves the integrity and purpose of the initiative. Moreover, partners within each of these initiatives fulfil a specific role or responsibility; complementing each other's capabilities and resources (human and capital), thus making the partnership stronger through the sum of its parts.

OuS also has a shared purpose which is articulated as a set of overarching objectives for the initiative. Each partnership/project within OuS is accordingly underpinned by the overall goal which is to research, deploy and disseminate best practices in open education with a view to developing an open educational system that supports the

existing formal education system in Slovenia. However, while the goals of each project in OuS align with this overall goal, each project is essentially a standalone unit and there are no connections across projects. As a result, a synergy has not evolved across the initiative, at least at this time.

- ***Smart Partnerships enhance the quality of education with digital technologies that harnesses the technology smartly.***

Given that both Smart Edu and OuS were established in 2014, the likelihood is that it is too early for evidence of enhanced quality of education from SmartEdu and OuS. Despite this, Nordin reports the emergence of a more creative student centred approach in which both students and teachers use technology for learning and teaching. However, evidence of this is not currently available from SmartEdu.

There is evidence of enhanced quality of education that harnesses technology smartly from the ITE initiative. Charania reports how prior to participating in the ITE initiative, most of the students have seen computers but would not have used them at school. In addition, teachers primarily enforced rote learning of content to pass school exams for middle school and higher secondary students (Charania, 2015). Evaluation of the ITE programme (Charania & Myers, 2014) highlights the main impacts as i) improving student teacher relationship, ii) increased student interest in many subjects, including languages, sciences, social sciences and mathematics iii) use of constructivist pedagogical processes and iv) increased student confidence in using digital tools and the internet. In addition, a 'smart' use of ICT has evolved over the duration of ITE as increasingly more efficient use has been made of digital tools to facilitate feedback. In ITE one of the most useful indicators to drive forward planning is the evaluation of projects created by students. Initial arrangements entailed the sharing of student work by CD and e-mail. This was followed by the creation of a blog through which student projects could be uploaded to the Internet and most recently, a website has been created for this purpose. The inclusion of a discussion forum on this website further extends the feedback process by enabling teachers to share experiences, challenges and best practices.

- ***In Smart Partnerships, partners recognise their role in the emergent process and facilitate their own organisation to change in ways that may sustain and scale the SP.***

There is no evidence to suggest that partners in SmartEDU or SoU have facilitated their own organisation to change in ways that may sustain and scale the SP. However, participation in the ITE initiative has enabled some of the partners to facilitate change in their own organisation. This was particularly evident in a district of Assam. Prior to joining the ITE initiative, the mission of the NGO (GVM) working in Assam was sustainable resource management. Therefore on joining ITE, staff and volunteers in GVM had a very limited range of educational strategies. Through adoption and implementation of ITE, they began to work firstly in a small number of adolescent learning centres in villages and later in 50 district schools. This led to an MOU between the state and the Trust to implement ITE in the state model schools, with the GVM being the implementation organization. The NGO has thus evolved from a grassroots level organization in livelihood and child protection, to become a recognised education resource organization within the state and having the credentials to work with the state education department. This partnership between the Tata Trust and GVM has become the largest scale implementation for ITE.

Conclusion and recommendations

This paper has elucidated the concept of SP and provided a definition. Of the three illustrations described, only one, the ITE initiative in India can be recognised as a SP with all seven characteristics. It is possible that the other two examples will evolve into SP and we believe that such evolution could increase their impact in education as well as addressing the digital divide. Now that SPs can be clearly conceptualised, it has become easier to identify potential illustrations. For example, Davis' collaboration with OER Universitas (see <http://oeru.org/>) leads her to suspect that it is an example of a SP in higher education that could also be providing some schooling opportunities too. OER's open platform, pedagogic and administrative style is an example of using digital technologies smartly to inform growth and partner collaboration in line with its vision.

This leads us to conclude with a caution and a recommendation. It appears that Smart Partnerships have been recommended before the concept was explored or researched so caution is urged. SP should not be recommended further until they are researched. Our final recommendation therefore is for such research into SP.

This research and development is recommended to inform the development of scalable innovative funding mechanisms that are likely to secure the resources that could unleash the full potential of digital technologies in education.

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