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Securing Syria's academic knowledge and industrial future through participatory action research: a case study of agricultural engineering education

Due to the ongoing conflict in Syria, the country's education system has been severely damaged across all strata, with disastrous effects on the nation's knowledge base, academic infrastructure and training provision. Since the conflict began in 2011, thousands of the country's 10202 academics (CBS, 2011) have been forced to cease working in universities and flee to other countries, mostly to Turkey, Jordan and Europe. Although no reliable statistical data are available (ongoing work supported by the Council for At Risk Academics (CARA) is seeking to achieve some statistical understanding in this regard), anecdotal evidence suggests that Syria's resident academic population may be reduced by up to 50%. Moreover, tens of thousands of university students have had no choice but to end their academic studies, for different reasons including risks associated with travelling to their universities, injury and risk to life due to military operations, escape from military service, and internal displacement. At the present time, Syrian academics and students - both within Syria and in exile elsewhere - continue to face significant barriers to continuing their research and scholarship.

Prior to the crisis, Syrian higher education was characterized by a theoretical focus, and concomitant lack of practical expertise relating to the needs of communities and industry. To address this deficit, governmental agencies and private companies used to provide intensive and specific training courses for new employees. Yet the war has also decimated these institutions, with the result that graduates have limited opportunities to apply and practice their theoretical knowledge acquired through higher education. The cumulative effect is that Syria's graduate population is rapidly deskilling.

Finally, pre-tertiary education in Syria has suffered greatly as a result of the crisis. The United Nations Office for the Coordination of Humanitarian Affairs' humanitarian response plan for 2016 (OCHA, 2016) suggested that Syria's youth do not have access to quality

teaching, and highlighted growing concerns that the toll of the conflict in its many forms is preventing children from learning foundational literacy and numeracy skills as well as those skills relevant to cognitive, social and economic empowerment. Thus future generations are not being equipped with the requisite skills to engage in higher education. In sum, Syria's intellectual capital has been dramatically eroded through war, putting at peril the country's ability to educate its population, sustain its industries and lead in its own regeneration.

Educating for industry: The case of agricultural engineers

The food security and agriculture sector accounts for more than 1.3 billion US Dollars of the Syrian national economy, is the primary source of income for more than 65% of the Syrian population (OCHA, 2017; FTS, 2017), and provides vital food resources at a time of crisis (OCHA, 2016). As with other sectors, agriculture needs highly skilled engineers to address and solve the problems it faces. Furthermore, such engineers need to be educated in awareness of the specificities of the Syrian context in terms of climate; soil; food chain; water management; plant propagation; plant protection; agriculture extension; artificial insemination; intervention management; seed systems; irrigation and land use techniques, and other aspects. As such, it is essential that strategies are developed to deliver effective university-level agricultural engineering education to Syrian populations in Syria and in exile, in order to sustain and secure the future of the sector on which so many Syrians' livelihoods depend.

This poster presentation reports on an action research project structured around a proposed strategic intervention for delivering tertiary-level, participatory e-learning to agricultural engineering students, alongside farmers and other professional stakeholders such as United Nations agencies, NGOs, local organizations, and commissions working on agricultural restructure and development. Through collaboration within the e-learning environment, the learning community engage in activities across the action research trialectic of *research*, *capacity-building* and *practice* (Senge and Scharmer, 2001: 40).

Contextual factors such as humanitarian crisis, ongoing war, displaced populations and the near-wholesale destruction of academic infrastructure are outlined. The programme aims are then set out as follows:

- To establish a workable online platform for distance learning.

- To identify and recruit academics in the field of agricultural engineering to design and deliver the programme.
- To recruit and enroll participants from the following stakeholder groups: students (*future agricultural engineers*); farmers (*frontline agricultural professionals*); and associate parties (*supporting professionals*)
- To design and deliver 10 modular courses, each comprising 4 lectures, in the first year pilot period of the project (2018)
- To longitudinally evaluate all aspects of the pilot year, using qualitative and quantitative methods
- To revise and develop the programme within an spiral cycle action research framework

Anticipated challenges, such as limited access to suitably-qualified academic staff and severe restrictions to resources and connectivity, are discussed, and proposed solutions are outlined. The action research process, following a spiral cycle model adapted from Kempis and McTaggart is outlined, encompassing data collection methods, evaluative techniques and timeframes. Finally, the poster looks beyond the study's immediate focus of Syria and considers some further-reaching implications of this action research for educational-humanitarian interventions:

- Supporting engagement between academia and industry in the context of war and humanitarian crisis
- Providing opportunities for at-risk academics to continue teaching and maintain the currency of their knowledge
- Providing opportunities for students, graduates and professionals in war-torn regions to refresh and sustain their knowledge and gain new skills
- Supporting educated individuals and communities in leading the regeneration of their countries
- Protecting the intellectual heritage of countries besieged by war and humanitarian crisis

References

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Please note: The limited number of references relating to the Syrian academic context is symptomatic of the paucity of research in this area, and a lack of up-to-date statistical information owing to the ongoing state of crisis in Syria.

International contexts and perspectives (ICP)