

IMPACT STORY

Frontier Technologies for Sustainable Development: Unlocking Women's Entrepreneurship through Artificial Intelligence in Afghanistan and Iraq

Background

Social entrepreneurship has grown over recent years to offer innovative solutions to development challenges while promoting the generation of livelihoods. This approach could be of great importance for countries in special situations, including countries in or emerging from conflict. UNITAR, , launched the online course **Frontier Technologies for Sustainable Development: Unlocking Women's Entrepreneurship through Artificial Intelligence in Afghanistan and Iraq**, to enhance women's entrepreneurship that contributes to the achievement of the Sustainable Development Goals (SDGs) and that harnesses frontier technologies, especially Artificial Intelligence (AI). The course benefitted from a Swedish International Development Cooperation Agency (Sida) contribution to the UNITAR Strategic Framework Fund.

The programme aimed to uplift women professionals from the public sector, private sector, academia, media, and civil society organizations in Afghanistan and Iraq with new knowledge, skills, networks, and attitudes. In order to achieve these objectives, the course included modules on **entrepreneurship and innovation, artificial intelligence and gender equality and women's empowerment**. A particularity of the programme was its personalized nature. Each participant was asked to develop a peer-reviewed business plan that addressed a specific development challenge in their country or region. The participants were assigned in subgroups or "teams", where they could exchange ideas on their business plans, under the supervision of one of the programme's coaches, who were also Afghan or Iraqi.

The course was delivered over 12 weeks between January and April 2020, and consists of weekly online sessions. Personnel from Stanford University's Innovation and Entrepreneurship Programme, and regional experts acted as mentors. In addition, the programme received technical assistance from Fuji Xerox Co., Ltd., and Amada AI Innovation Laboratory Inc. of Japan.

Out of 35, 28 women between 18 and 40 years old were selected, 13 (46 per cent) from Afghanistan and 15 (54 per cent) from Iraq. The selection process criteria to consider were professional background, motivation, being related to an area of entrepreneurship, SME development, or frontier technology and innovation; and human resource development role in specific areas of professional responsibility



Course learning objectives:

- Recognizing the tools for innovation that every organization needs to succeed.
- Developing innovation skills customized to fit professional and organizational needs.
- Developing a personalized business plan combining current research on AI and entrepreneurship to address development challenges.

in addressing sustainable development. Furthermore, participants needed to secure their job supervisor's support and commitment to participate in the training.

All participants expressed overall satisfaction with the course, found it to be overall useful and intended to use the knowledge. Moreover, 82 per

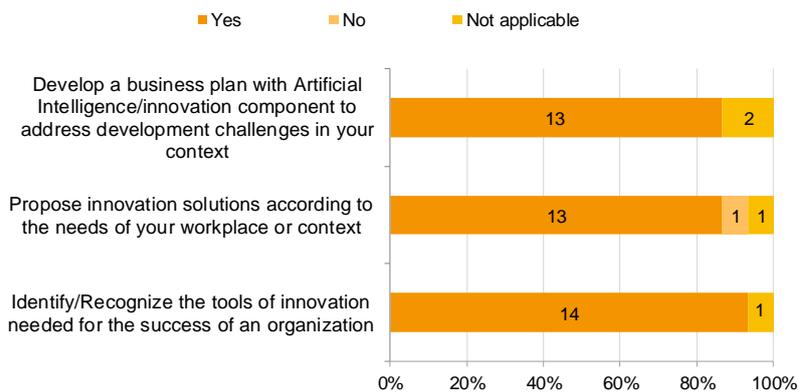
cent participants indicated that the information was new and 75 per cent that it was relevant to their jobs.

In this Impact Story, we review the results from course participants (and share the stories on the most significant changes to three of them. You can also read related news stories on [Tamana](#) and [Madina](#) and [many more](#).

Learning objectives and application of knowledge and skills

For this Impact Story we conducted an online survey to understand the changes in behavior of participants seven months after the course. We received feedback from 15 participants (out of 28), representing a response rate of 54 per cent. Most of the survey respondents had a background in either entrepreneurship or project development (47 per cent), or in the technological field (53 per cent), and 24 per cent (equivalent to 4 participants) in both of them. Our in-depth interviews also confirmed that one of the motivations to enroll in the course was to complement their professional backgrounds, gaining knowledge in the area that they were not experienced in or strengthen what they already knew but from a different perspective.

Figure 1: Have you applied or transferred any of the following knowledge/skills to your work?



Overall, the application of knowledge and skills acquired in the course to the workplace was high (87 per cent), except for one of the participants who was unemployed at the moment of the survey. Moreover, all of the participants considered that the transfer of knowledge and skills to the workplace was a consequence of the course, and at least 93 per cent

attributed more than 25 percent of the transfer to the course.

However, the survey results suggest that “direct” application of the technical knowledge/skills was less common, especially for those working with technology. When we asked the participants how they have applied the knowledge and skills in their workplace, the examples were related to changes in their understanding about business design notions and the importance of innovative solutions, or attempts at starting their business plans (that most of them have not been able to implement). Besides two of the participants who have now become coaches for future UNITAR courses, only two others have created marketing strategies for their organizations.

The main challenge for transferring knowledge from the course was the lack of an enabling environment or process support. Thus, support in the workplace is not only important for completing the course but for applying the knowledge after it. On the other hand, the most important enabling factors were confidence, having the opportunity to apply knowledge and skills, and the importance of the knowledge to job success, respectively. In fact, the participants indicated a confidence of applying the knowledge above 86 per cent for all of the learning objectives. The above mentioned highlights the importance of support at work in the success of knowledge application beyond initial supervisor support at the registration.

Regarding business plan development, one of the participants confirmed to have successfully implemented her business plan, and 80 per cent indicated that work on their project business plans was continuing after the course, but they have faced many challenges implementing them. As expected, the COVID-19 pandemic was one of the most common reasons for not being able to implement their plans. Other challenges limiting the implementation of the plans are the lack of funds for the initial investment (seed capital) and lack of time due to work or studies. Figure 3 illustrates these challenges.

Figure 2: Did you continue working on your individual business plan?

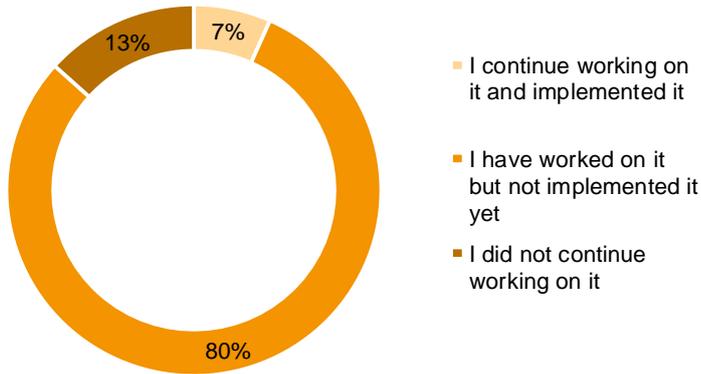
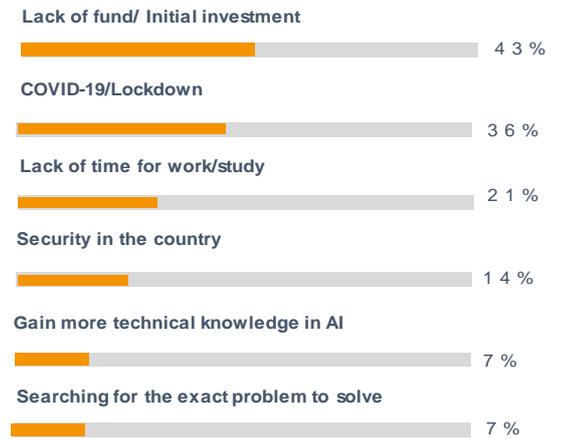


Figure 3. Main challenges for implementing the business plan



While the business plans tackled development challenges and connected solutions to the SDGs in their environments, especially incorporating barriers faced mostly by women, most of the plans did not incorporate innovation and technology elements in their designs.

Business plan developed by the participants





Ms. Sara Mustafa

Computer Engineer

An AI and data science future for Iraq

We had the opportunity to talk with Ms. Sara Mustafa who works as an integration engineer in a telecommunications company in Iraq. She believes that AI might be the future for the telecom sector in Iraq, and she would like to contribute to the growth of AI and data science in her country. Sara has had this wish for a long time but was lacking the entrepreneurship knowledge to lead a project and the opportunities to innovate inside her workplace. When she learned about the UNITAR course through social media, she decided to apply as it addressed her needs at that moment.

Sara found the course's webinars very informative and interactive. During the course she was really immersed and compromised, mainly because of the motivation and support of the programme coordinators throughout the process. The coaches were more difficult to reach because they had other responsibilities outside the course and needed to attend to all the teams' participants.

Creating a business plan was a great opportunity for Sara to study as much as she could and build relationships with other entrepreneurs in Iraq. She **now feels very confident to join webinars and other events related to entrepreneurship and share her ideas about the topic.** Understanding the technical business reports at work is now easier for her. She can now understand better what is behind the numbers and how to interpret margins, profits, and other business terms. The course also changed her perspectives on the future and what she would like to do in the next years. AI and data science is something she definitely wants to explore further.

Although the course only had one introductory session on AI, it motivated Sara to continue building her knowledge on AI and data science. While studying her degree in computer sciences, she took a few classes on AI and robotics, but as the field is advancing at a fast pace, continuous learning is needed. For Sara, the more you study the topic, the more encouraged you feel to automatize your daily tasks. For example, **after the course she started to automatize some of her daily tasks at work that allowed her to become more efficient and to complete tasks that usually took her 3 hours in just 15 minutes.** This included for example writing scripts to finding files more easily. This also increased her motivation at work. While Sara received support from her supervisors to apply for the training, changing fundamental approaches at work by including more innovative AI and machine-learning techniques require a lot of preparation, testing and risk analysis and do not permit her to apply her skills in the short term at her current work.

Her business plan was, of course, related to data science and AI. It is about a mobile application that helps people to get personalized mental health attention in English and Arabic using machine learning for it. As accessing in-person professional psychological attention is difficult where she lives due to the high levels of stigma (people do not want to be seen at hospitals) and the short supply of specialists, Sara had the idea to create an app where people could get treatment in their

own privacies and in their local languages. After the course, she has continued working in her idea but has not yet implemented it, with the main challenges being online banking restrictions, lack of additional personnel to support the app development, and cultural issues such as lack of confidence to share personal data.

In the long-term, Sara aspires to become a leader in AI and hopes that one day she will take the initiative and be able to educate and involve more people in AI, especially youth. She believes many local development challenges can be solved by using AI, it is time for them to conduct research on how to use AI and data science and try to go forward to solving their problems. As a next step, Sara is thinking on applying to a master's degree in data science and use this potential knowledge to implement her project.



Ms. Atiqa Mirzayee

M&E Officer – Aga Khan Foundation

Entrepreneurship and gender equality for local development projects in Afghanistan

Development projects were not new to Atiqa, whose work concentrates on monitoring and evaluating programmes focusing on agriculture, economic inclusion and civil society. In a practical manner, the organization she works for also includes the notions of gender equality in its work, trying to involve women in communal activities to the largest extent possible and contribute to women empowerment (for both, the beneficiaries and the staff). Atiqa, however, had never taken a formal course on entrepreneurship or in women empowerment. Being aware that this knowledge could benefit their daily work, the organization she works for encouraged their employees to participate in the UNITAR course. Her supervisors were also enthusiastic that their employees could obtain a certificate. When Atiqa read the title “Entrepreneurship for women” she did not have any doubts about applying, as the topic was new to her. She considers that her supervisors’ support was crucial to completing the course.

Atiqa is passionate about learning new things, and the UNITAR course was no exception. As she does not work on Fridays and Saturdays (weekend days in Afghanistan), she devoted these two days to attend the weekly sessions complete the course readings and work on her business plan. Atiqa found that the course helped her to gain experience in entrepreneurship and gender equality, that she can now apply theme to her work. Part of Atiqa’s duties is to introduce and explain the projects to the beneficiaries: what are the projects about, their potential benefits, the activities to be developed, and level of involvement needed from the participants. When going to the field, for example, she can explain the projects better and has **used the knowledge on gender mainstreaming to explain to women about women’s rights, the right to work, women’s participation in society and community, and how they could earn an income by themselves and become more independent.** Atiqa told us that many women in Afghanistan are excluded from social life, but this is changing and **she wants to contribute to this change.**

Given the good atmosphere at her workplace, Atiqa has shared some of her new knowledge with her colleagues. In fact, Atiqa developed her business plan idea with a colleague who was working in Balochi handicraft as part of the projects in the division for economic inclusion, and received advice from her manager as well. In Afghanistan, Balochi women have the ability to make handicrafts and this is part of their identity, as portrayed in the picture below). Atiqa’s project consists of finding a market to sell the handicrafts at a good price in Afghanistan or foreign countries. Even though the project was not related to AI, she chose it for its potential. Working on the handicrafts would keep women busy, give them the possibility to work at home, and allow them to earn an income. They could also share their skills with other women, especially to those who are illiterate or cannot go to school but they could still generate gains. Unfortunately, the COVID-19 pandemic prevented her from continuing with the project.

The support she received from the course coaches greatly helped Atiqa elaborate her business plan. The participants in her team had a WhatsApp group, where they could share ideas and with their coach or communicate via email. For Atiqa this was highly beneficial, as most of the team members were entrepreneurs, and she could learn a lot from them. Atiqa says she is very thankful

with UNITAR for giving her the chance of participating in a programme directed to women. She hopes she can discuss ideas with other entrepreneurs from different countries in the future.





Ms. Raniya Sarra

Master Student of Computer Engineering

Foreseeing women in technology in Iraq

Raniya Sarra lives in Baghdad, Iraq. Her interest in entrepreneurship started when seeing it develop in her community as people started to head to this field to improve their economic conditions. This is why she had taken two courses and volunteered in projects related to leadership, project management, and innovation even before the UNITAR programme. These experiences impacted her a lot, and Raniya decided to combine it with her professional experience as a computer engineer. This was her main motivation to enroll in the UNITAR course, which she found thanks to a friend's Facebook post.

Raniya has a strong background in technology and already knew about AI. She specializes in information technology, worked on web development and graphic design for five years and was also a university lab instructor before she decided to start a master's degree. While the course's AI session was understandably very introductory for her, she appreciated the quality of the entrepreneurship-related modules facilitated by the Stanford team, and the modules on gender equality. Before the course, she was not that familiar with the concepts of gender equality and empowerment, the SDGs, and how to contribute to the SDGs when developing a project. Raniya also valued the course's methodology and in particular the usefulness of the assignments, the peer-review of the business plan, and the group teamwork, where participants could combine experiences for their business plan development.

The course changed how Raniya thinks when looking for solutions to challenges. Before the course, the solutions she offered were not always applicable, but now she can use the tools provided in the course. It also changes her mindset even in simple tasks that she can use at work and for her studies, as creating daily or monthly schedules. She feels that she is now better organized and using her time more efficiently.

Raniya's experience as a university instructor helped her set the problem statement for the business plan. Raniya realized that many skilled graduated students could not find job opportunities because there was a disconnection between job seekers and suppliers. She also found that this was still more common for women, who usually have fewer networks and then, opportunities to get a job. **Using the five-steps of design thinking methodology¹ she learned about in the course and video and other material from the course, she developed a plan for an application that connects recent graduate students and organizations looking for workers, with a gender component.** Her coach was of great help during the development of her plan and advised her to start small in the beginning. Continuing the plan was difficult, nevertheless, since she still needs to have the right team to implement the idea which is very technical. Moreover, other deterring factors include limitation with the initial investment, and time constraints, considering that she has started a master programme and creating a mock-up requires a lot of time.

Currently, Raniya is completely devoted to her master studies in computer engineering and although she is not volunteering anymore, she believes in the power of giving back to the

¹ Five steps of design thinking methodology: i) empathizing to gain better understanding; ii) defining the problem; iii) brainstorming solutions; iv) prototyping the best solution; and v) testing the prototype and getting feedback.

community and engaging in small acts to improve the society she lives in. After her graduate studies, she would like to continue pursuing the business plan idea to contribute to employment generation. Raniya has applied for scholarships to study data science abroad and gain the required knowledge to continue her project. As an alternative plan she expressed the possibility of continuing her higher education and start a PhD after her studies to eventually become a professor in data science or leading a business. A motivation that led Raniya to become involved in technology is the few women in leading positions, even though there are female professors and students in the field. She would like to see more women leading the technology and innovation area in her country.

Conclusion

The course was effective to generate knowledge and skills that could be applied to innovative solutions of local needs and challenges following rigorous methodologies. It also helped to reinforce and complement the participant's expertise on entrepreneurship and new technologies. The coordinators' support and the course design (creation of teams and peer-review methodology) were important elements for an adequate generation of knowledge.

The gender equality component was relevant in the creation of the individual business plans, and in some cases, it was incorporated to the participants' day-to-day work experiences.

The application of knowledge and skills within the participants' workplace has been more difficult, however, mostly due to the lack of support and structures within the workplace. Nevertheless, the participants indicated some changes in their daily work, and in their personal lives. They also have shown themselves more motivated and committed to continue learning and use the acquired skills to implement their long-term goals.

Some initial seed funding or continued follow-up with participants after the course might help participants to implement their business plans, which have been affected by the current unstable environment, and consequently lead to real changes.

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