

Recommendations to Improve and Expand the DigiGirlz Morocco Mentorship Program

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Abstract

DigiGirlz Morocco was established in 2017 in response to the lack of opportunities and support for young girls interested in STEM and IT in Morocco. DigiGirlz is linked with Association Anoual, a Moroccan NGO whose mission is to “Empower the future leaders for effective initiative and positive impact in their communities” (Association Anoual Home, 2020). Their mentorship program empowers university and high school-aged female students to pursue IT endeavors and teaches valuable skills such as leadership and self-advocacy. Our team assisted DigiGirlz in developing strategies for future expansion. We recommended methods to improve their current program and proposed a list of potential partner organizations including strategies to expand the program internationally.

Executive Summary

Introduction and Background

Around the world, there is inequality between the number of women and men in the IT and STEM fields. The three members on our team who identify as women grew up seeing science and technology fields populated by more men. This is evident in media such as movies, books, and even textbooks where the majority of the engineers are men. Globally, women account for only 20% of the IT workforce (Varley, 2018). Moreover, when women do pursue IT and STEM jobs, they do not stay as long as their male counterparts in the workforce due to the challenges of being a minority (Gaudin, 2017). In Morocco specifically, the percentage of men and women studying STEM and IT in university is almost identical, whereas the number of women who have careers in IT or STEM is significantly lower (Wadhwa, 2019). This shows a disconnect between women finishing their degrees and joining the workforce.

The purpose of many non-profit organizations is to create initiatives that combat this gender career gap as well as disparities such as health equity, racial and ethnic inequalities, and gender wage gaps. An example of that includes the global Technovation Families organization where they help to advance opportunities for children and adults in the field of STEM (Technovation Families, n.d.). In Morocco, one Non-Governmental Organization (NGO) in particular, Association Anoual, has a mission to empower young leaders through social innovation and entrepreneurship to bring creative solutions to the challenges their society faces (Association Anoual Home, 2020). One of their programs that serves this mission is the DigiGirlz Morocco Mentorship Program (DMMP). There are Microsoft DigiGirlz programs all across the world but DMMP is unique as it is the only program with the mentorship aspect (Microsoft, n.d.). Our team worked specifically with the mentorship program in Morocco, not the larger global Microsoft DigiGirlz program. We will be referring to the program as DMMP throughout the report. The mission of their program is to provide opportunities and support to young women who have an interest in IT or want to experience learning about the field. DMMP focuses on training and pairing female college-aged mentors with female high-school student mentees. Together, the mentor and mentee teams develop technical skills such as coding, web development, and soft skills like entrepreneurship and self-advocacy. They completed three program editions since their first in 2017 and are continually looking to improve and modify



Figure 1: Our sponsor, Souhail Stitou, VP of Association Anoual and Program Director for the DigiGirlz Mentorship Program

their program. Now, they are aiming to grow their program beyond Morocco and into the North Africa region to expand their audience and create a greater impact. The program is looking for guidance in how they could find organizations and methods to accomplish their goal of expansion. Our primary contact for DMMP, Souhail Stitou, defined their vision of expansion as where and how the program can be implemented in the future to increase the number of girls interested in STEM and IT. Our team assisted DMMP by determining which organizations they can partner with in other North African countries and how

to most effectively expand their program, while keeping their core values and purposes intact.

Our Approach

The goal of our project was to provide DMMP with recommendations for expanding their mentorship program throughout North Africa. We did this by developing and completing three main research objectives.

Prior to our research and data collection, we examined the scope of the project and assessed our team's capabilities. Mr. Stitou, our sponsor, provided us with an overview that outlined what the program was looking for help with. This included the need for recommendation strategies to expand their mentorship program throughout the Middle East and North Africa (MENA) (S. Stitou, personal communication, 2020). We chose to narrow our focus to only North Africa since we had a seven-week time frame and it was not feasible for our team to research organizations in all twenty countries in the MENA region.

For our first objective, it was important to understand the structure of the DMMP. For this, we conducted semi-structured interviews with DMMP administration and past participants (mentors and mentees) and collected survey data from past participants as well. For the second objective, we researched and located viable partner organizations in North Africa. We did this by using a set of criteria to gauge the organization's compatibility with the DMMP (Appendix E.1). We found these organizations through open-source research, built a list of what we found, and reached out to those that met our criteria to conduct interviews. We chose to conduct these

interviews to further understand how they could potentially help DMMP in a partnership. Lastly, we presented DMMP with specific strategies for how and where they could expand into North Africa. In this third objective we needed to understand what expansion meant and what examples of strategies looked like for NGOs. As we began research, we noticed that there is a lack of available literature on the subject of NGO expansion. We conducted interviews with professors at the Foisie Business School to address this issue and help us define the crucial terminology for this objective. After completing these three objectives, we were then able to produce an interactive PDF guidebook as a deliverable for our sponsor.

Results and Recommendations

The final deliverable we created is an outlined guide to assist DigiGirlz's vision of expansion. We established three recommendations for DMMP which are based on analyzing the strengths and weaknesses of the program. The deliverable included the recommendations from the data collection done for the second two objectives.

Our initial recommendations were based on the interviews and surveys we conducted for objective one where we gained a deep understanding of the program. We asked questions about challenges within the program. The staff expressed that they wanted to expand internationally, as well as in Morocco. We learned from one past administrator, Chaimae Idrissi that the administration does not feel connected with the mentees throughout the course of the program (Appendix G.3). She felt that they were mainly communicating and bonding with the mentors but never really got to know the mentees. We suggest that the administration find ways to meet with the mentees and think about building up those relationships in the future. These connections will create a more comfortable space for the mentees and encourage them to come back and participate in the program as a mentor or volunteer. The information we gathered led to recommendations for the program as well as for expansion

After hearing about the program from various perspectives, we also found some unique differences in the challenges faced by past mentors. The interviews and surveys with past participants exposed a common theme. We found that a slightly more detailed application and a less rigorous training process would increase motivations and attention levels of the participants. Interviewee Three believed that the application process did not always accept girls that were motivated and ready for the program (Appendix G.4). DMMP can ensure their participants are

dedicated and have scheduling availability if more detailed questions were included in the application. We also recommend that DMMP consider restructuring the Training of Trainers (ToT) weekend. We found that a large group of past mentors felt three days was not enough time to grasp all the lessons and concepts taught (Appendix F). Moreover, without having these technical and soft skills from the training, it made the project experience more challenging. Interviewee Three and Interviewee Five shared that they came in with minimal coding experience but did not feel that the ToT provided them with enough background to guide their mentees. They both suggested that DMMP expand the three-day weekend for training over the course of one week to ensure the mentors have sufficient energy and stay focused to benefit the most (Appendix G.4 and G.6). Dividing up the ToT will result in the Mentorship Program having young women that are more confident in their abilities to lead a team and create an IT project on their own.

The deliverable we developed is a guide with a list of organizations that met both DMMP's and our criteria for a potential partner. Under each organization is a detailed description of the type of organization they are, where they are located, what their mission is, how they are structured, what sort of work they do, what programs they have, partners they have, and more (Appendix E.2). We then created a set of steps for how DMMP could create a partnership with each one based on what we learned in data collection and analyzing. Some of the steps suggested were researching the potential new market, reaching out to organizations, defining responsibilities and roles, and understanding shared impact for both organizations. This deliverable also included expansion strategies and methods for reaching out, working together, and maintaining the partnership into the future (see Appendix J). We provided each organization's contact information, as well as the aspects that describe why they are comparable to DMMP (Appendix J). Ultimately, this document highlights our main recommendations for successful DMMP partnerships.

Conclusion

Our project's goal was to provide DMMP with techniques that they can use to both improve their organization locally and successfully expand beyond Morocco and into North Africa. Expanding internationally will not be easy but starting small and creating one or two new partnerships with similar organizations can hopefully motivate DMMP to continue growing. As

mentioned by Souhail Stitou, he and his program colleagues are motivated to take their growth process one step at a time (S. Stitou, personal communication, 2021). They recognize that they will not instantly start up a DMMP in surrounding countries, but need to start somewhere. Our team will be helpful in aiding them in taking the first step of their expansion.

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Chapter 1: Introduction

DigiGirlz Morocco Mentorship Program is a non-profit organization working to create opportunities for young women, specifically to explore an early interest in STEM (Science, Technology, Engineering, and Math) and IT (Information Technology). Their mentorship program is challenging the status quo, within which women account for only 27% of the global STEM labor market (Martinez, 2021). They focus on helping women develop technical skills such as coding and soft skills, including entrepreneurship. In Morocco, the technology field is continually expanding, in parallel to the demand for skilled STEM labor (El Masaiti, 2017). To have a greater global impact, the program is actively looking to expand into other regions within the Middle East and North Africa (MENA) with the hope of engaging more participants (S. Stitou, personal communication, 2020).

There are many women qualified and interested in STEM careers in Morocco, representing 45% of engineering students. However, there are disproportionately fewer female engineering professionals (Betachy et al., 2009). Although it was challenging to find data to represent the percent of women in the professional IT fields in Morocco, we gained insight from Moroccan University students. Their first hand experience provided some context for the disparity of women in the IT and STEM workforce. Additionally, the American Institute of physics states, “In most cases, male scientific communities do not accept women as equal partners who could contribute to the advancement of science to the same degree as men” (Betachy et al., 2009). This incorrect belief accounts for much of the difficulty women bear while networking and applying for STEM jobs to enter the field.

DigiGirlz Morocco Mentorship Program (DMMP) worked with our team from Worcester Polytechnic Institute to assess the scalability of the mentorship program and identify partnership opportunities in North Africa. Initially our scope was assessing the MENA region and we trimmed it down to only focus on North Africa. We conducted interviews and surveys with DMMP to gain an understanding of how to improve the experience of the young women involved. We also researched organizations that could assist DMMP in reaching more young

women. To establish a successful expansion within the North Africa region, we ultimately recommended various strategies and steps for DMMP.

Chapter 2: Background

2.1 Introduction

Women in the professional sphere around the world face significant cultural and societal difficulties not faced by men. Women pursuing STEM and IT fields are at a greater disadvantage because women have not historically filled these roles, and there is a global stereotype that these roles are better suited for men (Makarova et al., 2019). Breaking these barriers adds hardship to women's journeys entering professional careers. DigiGirlz Morocco Mentorship Program (DMMP) aims to aid and empower young women in their journey into IT fields in Morocco. Their program focuses on supporting women through mentoring that builds both technical and soft skills such as web development and leadership. DMMP provides numerous benefits to its participants and works to create an equitable environment for women pursuing STEM and IT careers in Morocco.

2.2 Women in the IT Workforce

On a world scale, programs such as DMMP bridge the gap for women looking to enter professional STEM fields. To analyze the gap that DigiGirlz is bridging is difficult because there is no legislation in Morocco barring women from entering professional spheres. The obstacles women overcome are underlying and systemic. Moroccan women represent 45% STEM students, but only 23% of engineering professors (Betachy et al., 2009). When women experience a lack of female leadership they are less likely to envision themselves as successful STEM professionals. Without mentorship from teachers to whom they can relate to and create relationships with, they miss the opportunity to develop leadership roles, which makes up the majority of tech jobs (Richterich, 2020). Another result of fewer women mentors is that students are less likely to build soft skills. Soft skills in IT is a combination of skills that include group work, creativity, communication, and leadership. (Doyle, 2021). Developing these soft skills and encouraging more women to join IT are the key missions of DMMP. The soft skills, mentorship and connection DMMP offers, provides the ladder to success Moroccan women need to level the playing field.

2.2.1 Gender Disparities in the Morocco

There is a gender gap in the workforce in Morocco. Many female workers are excluded from economic activity. In Morocco, “men are expected to be economically active [and] women outside the labour force are often responsible for a majority, or all, of the household and care work” (“Young Women’s Employment”, 2017). The barriers to women being part of economic empowerment include limitation to education, local enterprise where job experience is gained, gender division of roles and opportunities, and giving up a career to do family work. Many more opportunities are offered to boys, whereas girls are directed more towards roles like humanities, health, art. The limitations of career choices are applied more towards women than men (“Young Women’s Employment”, 2017). Despite these pressures, 45% of the students enrolled in the IT fields are women in Morocco (Betachy et al., 2009). Few of those female students achieve leadership positions (Islam, 2017). Even with all of these factors making the STEM field uninviting for women, the numbers continue to grow.

2.3 Women in STEM and IT in Morocco

Despite the stereotypes that the science and technology fields are meant for men, Arab women are actively pursuing STEM careers in universities. In Morocco the percentage of students enrolled in the STEM universities are composed of 45% women. The percentages of women enrolling in school to study STEM or IT in Morocco are consistently growing (Betachy et al., 2009). However, an issue becomes clear when these degrees do not necessarily provide women with access to jobs, careers, or leadership positions. Women do not receive the same encouragement and strong legislative support to successfully enter the workforce, be productive, and achieve long-term economic prospects in the STEM and IT fields (Islam, 2017). This issue is not only noted in Morocco, but almost all over the world (Islam, 2017). Oftentimes, gender stereotypes and gender biases push girls and women away from pursuing fields and hobbies that have a male majority (Wood, 2020). Organizations such as DMMP are extremely important in breaking these stereotypes and biases. Their work provides additional opportunities to young women who need support in the IT field. Programs such as DMMP are paramount in helping STEM educated women obtain jobs post graduation.

2.4 Origins of DigiGirlz Morocco

DigiGirlz Morocco Mentorship Program (DMMP), an affiliate of Association Anoual, a non-governmental organization (NGO), aims to help address the gender gap in the STEM and IT industries in Morocco. DMMP focuses primarily on IT in their mentorship program. IT includes computer science or information systems and their work included leading research development teams or research groups (Mitchell, 2020). These are specialized fields that include computational data processing, decision support, and business software (Mitchell, 2020). Possessing the fundamental knowledge to excel in their education is important for young women trying to advance careers in a male-dominated industry (Branson, 2018). We know that DMMP's purpose is to support women in STEM and IT fields but we must consider why they are important in Morocco and on a larger global scale.

The first edition of DMMP began in three cities: Kenitra (located closely north of Rabat), Tiznit (more southern, along the coast), and Er Rachidia (central Morocco, east of the Atlas Mts.). In 2018, at the start of the second edition, DigiGirlz Morocco introduced the mentorship aspect to their program. According to our primary contact, Mr. Stitou, the mentorship program “helps build capacities of youth to make them able to create change in their communities through the training that we will give them” (S. Stitou, personal communication, November 13, 2020). This mentorship edition focused on creating a connection between mentor and mentee. From 2018 to 2019, DMMP recorded nineteen female university students who served as mentors and represented many cities from across the country. Each mentor worked with a team of high school-age mentees for four months. The DigiGirlz Program is an international Microsoft-run program but the creation of the mentorship aspect in Morocco was revolutionary for DigiGirlz Morocco. This made DMMP stand out as it was the only DigiGirlz Program around the globe to have become a mentorship program. Association Anoual was responsible for creating and managing the mentorship program, while the United States Embassy provided monetary support, and Microsoft developed the original brand (S. Stitou, personal communication, November 13, 2020).

2.4.1 The Mentorship Program and Training Process

The mentorship program features the training of female mentors who work with high school-age students and guide them in their projects. This process is referred to as “the training

of trainers,” or ToT as it’s colloquially known. Microsoft partially hosted the training events for the mentors, with guest lecturers and teachers sourced by Microsoft as well. These trainings are hosted in person, then the mentors return to their respective cities and generate interest among high school students to participate in the program as mentees. They give talks and presentations demonstrating how IT is a viable field for women. For the most part, this system has remained the same throughout the past four years but was altered in the third edition to include more participants (S. Stitou, personal communication, November 13, 2020).

Mentors and mentees work together on a variety of projects for four months. Mentees choose their projects which are designed to solve a problem that they identify in their own



Figure 2: DigiGirlz Morocco Mentorship Program Training of Trainers 2020

communities. The majority of these projects are IT based, so they are learning IT skills while solving local issues. As the final result of the program, the teams often develop apps or physical products. The participants present these final projects at regional competitions, where their work is judged. To conclude all the hard work done by both mentors and mentees, groups congregate for a final national competition composed of the most successful regional projects to showcase

their work and pitch their projects to experts in the field (S. Stitou, personal communication, November 13, 2020). This competition encourages mentees to learn important skills such as presenting, public speaking, networking, and self-advocacy.

Initially, Association Anoual representatives contacted university students between 18-25 years old who had previous knowledge in the IT field, either in studying IT in universities or prior coding experience. This was only necessary for the first year of the program. Many mentors started clubs at their respective universities to bring in new mentors and spread word about DMMP throughout their communities. Therefore, more than enough mentors applied without any direct outreach in following years.

The Association Anoual team handles the process for selecting the mentors. In 2019, eighteen mentors were chosen out of a pool of seventy-two applicants. This supply and demand

relationship has helped the organization with the recruitment of new mentors. Previously, the trained mentors would be paired up with one team of mentees. In recent editions there were teams of four mentors paired up with two larger teams of girls. This change was strategic in order to allow the mentees to work together and learn from each other, and provide more opportunities to accept a greater number of participants (S. Stitou, personal communication, November 13, 2020).

2.4.2 Organization Challenges for DigiGirlz Due to COVID-19

The DMMP Administration altered the third edition of the mentorship program to accommodate online communication as a result of the COVID-19 pandemic. While the program was still a success, with around 200 mentee participants, new difficulties arose with virtual education. The mentors found it significantly more difficult to connect on a deep level with their mentees. For this reason, the retention rate was not equivalent to the typical participation in the mentor program. The struggle to retain the attention of girls working remotely is also shown in individual challenges the students face outside of academics. Not only does virtual learning increase many mental health issues, but it also decreases motivation levels (Chtatou, 2020). The pandemic has also resulted in economic, health, and social obstacles in Morocco (Chtatou, 2020). These factors are making the mentorship program difficult and are in part due to students losing months of schooling. The girls had a hard time attending six hours of online school, to then complete extra hours of voluntary IT work with DMMP. Additionally, “nothing can replace the direct pedagogical relationship, face-to-face, between a teacher and [their] students” (Abioui, 2020). This is certainly reflected in the changing dynamic of mentorship due to COVID-19. We took these challenges into account while considering the third and fourth editions of the program, but worked under the assumption that the effects of COVID-19 will dissipate as the program progresses.

2.5 Defining Expansion Strategies

We determined our goal for the project would be to provide DMMP with recommendations for expanding their program into the North Africa region. By looking closer at this statement and the scope of our project, we recognized that we did not understand what successful expansion or expansion strategies were. If we wanted to present Mr. Stitou and

DMMP with recommendations for how and where to expand, we needed to define terms such as *recommendations* and *expansion strategies*. These terms were crucial for us to have a solid understanding of in order to move forward with our research. Mr. Stitou's understanding of expansion was, "seeing where the program can be implemented, especially in the following 2-3 and 5 years, how can we scale the number of beneficiaries, how the project can advocate for girls in STEM, and all of this mainly in the MENA region or Africa in general" (S. Stitou, personal communication, 2021). Based on this scope we then created the three objectives, one of which was building our own definition for strategies to help DMMP expand in the future. Throughout our preliminary research, we identified a gap in the literature and resources regarding the expansion of NGOs. One source even stated "there is relatively little literature on how and why [NGOs] grow internationally," (Kaltenecker, 2019). Our team also found this to be the case while trying to identify background information that would provide a framework of how NGOs have expanded in the past - we were unable to find relevant information in a variety of databases, and even in open-web research. This noticeable lack of literature ultimately affected how we chose to structure further aspects of our project.

2.6 Conclusion

Developing an understanding of women in science and technology fields in a global and Moroccan context provided us with essential background information as we worked with DMMP. Additionally, understanding the impact that DMMP has already made was important when framing the lens through which we set the objectives of this study. They have begun an important mission of providing young women with knowledge to become leaders and change-makers in their communities. Moreover, their mentorship programs give female students a chance to explore subjects and possible careers they may not previously been exposed to. The work DMMP does provides a beneficial service to young women around the country and we will work to determine if and how we can expand this program to have a greater impact in the MENA region.

Chapter 3: Methodology

3.1 Introduction

The goal of our project was to provide DMMP with recommendations for expanding their mentorship program throughout North Africa. From our initial research on the DMMP and from what we learned from our sponsor, we began to understand how DigiGirly Morocco is organized and what the mentorship program offers. To ensure that our data provided us with useful conclusions, we used these strategies to complete each objective. We then presented DG with these conclusions. Our objectives were as follows:

Objective 1: Assess how DigiGirly Morocco's Mentorship Program is structured.

Objective 2: Locate viable partner organizations in North Africa and analyze key factors for compatibility with the DigiGirly Mentorship Program.

Objective 3: Present DigiGirly Morocco with strategies for expanding across North Africa.

The following sections describe each objective and will discuss detailed reasoning for the techniques used to help us achieve each objective. The challenges and limitations mentioned later in this chapter, also help provide context for the work we produced and how we completed it.

3.2 Objective 1: Assess how DigiGirly Morocco's Mentorship Program is structured

In this initial phase of our work, we needed to understand how DMMP operates in order to think about expanding and implementing it in North Africa. It was important to understand DigiGirly's process of selecting mentors and mentees, how they team up, and the work they do in the program. Gaining that information helped us recognize if the process is working for the participants. To collect data from the program participants, we sent surveys followed by requests for individual interviews. We also set up interviews with DMMP administrators who worked in the mentorship program in the last and current editions.

3.2.1 Interviews with Administrators

We conducted semi-structured interviews with members of the DMMP administration team to understand the format of the program. These administrators included the vice president of Association Anoual and program director of DMMP, Souhail Stitou; the program coordinator, Chaimae Idrissi Smaili; and the evaluation and follow up coordinator, Ghizlane Akourim. The goal of the interviews conducted was to help us understand the DMMP in greater detail. The three interviews helped us learn how and why the program runs in a certain way from their point of view. We began the interviews by asking for oral consent to continue and to record the Zoom session, then proceeded with questions we had prepared ahead of time (see Appendix B.1). Two different team members were present at each interview, one member was assigned to lead each interview and one noted the minutes.



Figure 3: DigiGirlz Morocco Administration Team

3.2.2 Interviews and Surveys with Participants

We interviewed three mentors who participated in the third edition (2019-2020) of the mentorship program. This allowed us to understand the program from a different perspective than that of the administration team. Our primary contact, Souhail Stitou, identified past mentors and mentees he believed were interested in being interviewed by our team. Mr. Stitou also informed us that the DMMP was conducted mainly in English and therefore it would not be an issue to conduct the interviews without a translator. The interviews with the mentors were semi-structured, with a list of questions prepared beforehand (see Appendix B.2) and were conducted on Zoom. If given consent, using the consent form in Appendix A.1, we recorded the Zoom meeting; we did not record mentee interviews in order to ensure their anonymity. Two members of our team were present in each interview, one facilitated the discussion and one recorded the minutes. One of the mentors we interviewed was also a mentee from the previous edition. This interview counted as both our mentor and mentee, since we asked the questions for both mentor and mentee. Unfortunately, the three mentees that we reached out to never got back to us to set

up an interview. Instead we emailed them a survey with the interview questions and had them fill it out.

We also conducted surveys with past mentors and mentees of the DMMP. We created two separate surveys (one for mentors, one for mentees), similarly structured, but with slightly different questions. For the mentee surveys, a link to the consent form was on the initial page with two required prompts confirming that consent is given from the parent and the child (see Appendix A.2). The mentor survey only requires one consent prompt because they are adults. These surveys were developed through WPI Qualtrics, a survey distribution and data collection software with a user-friendly interface. This allowed us to easily share and translate our survey questions. To distribute these surveys, Mr. Stitou emailed the mentors a link to the surveys, available in English, Arabic, and French. These were then forwarded along to the mentees (see Appendix C.1). Mr. Stitou informed us over slack that “French and Arabic would be easiest for the parents” to read as they are the most commonly used languages (S. Stitou, personal communication, 2021). Arabic is the official language of Morocco, but French is used in professional and business settings. We included an English translation as well because it is taught as a language option in schools and there are many English-learning centers in the country, but we could not assume everyone could read it especially in rural regions. The Institutional Review Board (IRB) requires that the consent form reader be able to review the prompt without help. To have our surveys approved as ethical we gave three translations to ensure there was not an issue. The questions pertained to the experiences of each participant and how they were impacted by the program (see Appendix C). Once collected, we examined the data to determine the structure, impact, and major assets of the DMMP.

3.2.3 Analyzing Collected Data

We used an open coding process to identify major themes that came out of our interviews and surveys with the program participants. We read through our data and created a table to do the open coding. The table included labeled sections that summed the data up and we categorized each data point under the specific section label (see Appendix D). This method of coding was important so that we could start with the smaller themes throughout the interviews and surveys then move into the larger connections and relationships. These results helped us effectively assess the DMMP and we were therefore able to make data-based conclusions for objective one.

We observed areas that DMMP was proficient and successful in, as well as areas where there was room for improvement as we considered expanding their program.

3.3 Objective 2: Locate viable partner organizations in North Africa and analyze key factors for compatibility with the DigiGirlz Mentorship Program.

This objective helped us identify which organizations in North Africa could be successful potential partners with DMMP. Partners and sponsors are two different types of organizations we identified in our search. Partners would provide resources like advertisement, speakers, and learning tools, while sponsors primarily assist with funding and marketing. We created a list of organizations that we considered to be potential partners for DMMP and began reaching out to them. We followed a list of key factors, such as location, mission, and structure to determine which to reach out to. These factors are discussed in further detail below. We reached out through the organization's contact email and various social media platforms to set up interviews. These were to help us learn more about the organization and any if they had plans of expanding that could involve DMMP.

3.3.1 Finding Viable Partner Organizations

To identify and learn about potential partner organizations across North Africa, we began by searching databases and Google using various search terms. These search terms included different STEM or IT Organizations in North Africa and NGOs in countries like Libya, Tunisia, Egypt, and Algeria. For those NGOs specifically we used search terms such as women in STEM, mentorship programs, women leaderships, and advocates for youth. We narrowed our search using search limits such as location, date (so that the organizations are more recent), and subject area (such as education, associations and organizations, science and technology, and female). An additional technique we used was to look through the partners listed on the organization's websites, to see if those connections could help us find other potential partners. We found fourteen organizations at the beginning of our research and ultimately we used three of them in our final report for DMMP. We started out with a long list assuming that a percentage of them would likely not respond to our interview requests. Following our initial research of each potential partner we proceeded to conduct interviews with all who responded and were willing to meet. For the organizations we were not able to interview there are many unanswered questions

regarding their ability to foster a healthy partnership. It was difficult to create a deliverable that shared all of the necessary information from our research to explain how and why DMMP should move forward with each organization. These interviews provided us with some of the needed information for creating recommendations for how DMMP could create a partnership with each organization (see Appendix B.4).

3.3.2 Analysis of Prospective Partners

After making the list of possible partner organizations, we began to sort and compare them based on the key factors we developed (see Appendix E.1). We focused on six areas of importance: type of organization, network, purpose, location, expansion strategies, and challenges that were used to build an initial profile of each organization as it relates to our research. Gaining a clear idea of how Mr. Stitou envisions expansion and knowing that he prefers a partner that brings more than just monetary value helped create these key factors (S. Stitou, personal communication, 2021). A profile of each organization, including DMMP, that provides the background information necessary to develop questions for our interviews with field experts. Our research showed that the following key factors (as described fully in Appendix E) are the most important area to analyze in order to assess compatibility:

Type of organization: Are they a non-governmental organization? Are they connected with the school system, high schools or universities? Are they a non-profit? By categorizing organizations we are able to make an initial judgment of if and why they may want to work with DMMP. Finding an NGO similar to DMMP is ideal because the two will have a chance to work towards a common goal.

Network: Who started the organization and when; who now leads the organization? Who is the main point of contact? How many people work with the organization? Is there potential for an introduction to more potential partners? Asking these questions will identify how experienced each organization is in creating and maintaining partnership. This will provide more opportunities for DMMP to add to their partner list in the future depending on if and who they choose to work with.

Purpose: The organization's purpose and mission. What is the organization's specialization? DMMP is looking to attract a partner that has a similar goal of addressing the gender gap in the workforce by offering more opportunities to the afflicted groups. We want to

identify organizations that will work towards this common goal with DMMP. This will nurture a stronger relationship between the two, as a common goal will help guide obstacles such as disagreements.

Location: Is the organization located in a physical building or space? Where is this? What is the surrounding infrastructure? Are they located in a rural or urban area? What sort of access to transportation do they have? Given that DMMP is a mentorship program that is typically run from a physical building where events and workshops are held, we want to know how similar potential organizations are to this dynamic. This will help us to understand how large the staff of each potential partner is and how they are currently using their funds. Our sponsor wants to be sure that any addition to DMMP outside of Morocco is managed well by the partners in that region.

Expansion Strategies: Strategies that were used within the organization in their growth and expansion process (if this occurred). Due to our limited understanding of expansion strategies as they pertain to NGOs in North Africa we took advantage of the opportunity to gather real world examples. Identifying organizations similar organizations can immediately benefit DMMP as they take note of how other organizations expanded into new regions. With that information they can learn from the mistakes of others and improve upon them.

Challenges: Obstacles that the organization faced and how they struggled or overcame these. How has COVID-19 affected them in their 2020 programs? Continuing from the last factor we want DMMP to take advantage of all learning opportunities presented by the potential partner organizations. This allows us to make up for the lack of experience we have in the industry and draw from that of others in a way that can ultimately benefit both sides.

DMMP is looking to expand their mentorship program and worked with our group to provide them with expansion strategies. To do so we first needed to gain a grasp on what similar organizations had successfully done and how they accomplished their goals, to provide evidence supporting our recommendations for DMMP. These key factors allowed us to take a structured approach to collecting the qualitative data on each organization.

3.4 Objective 3: Present DigiGirlz Morocco with strategies for expanding across North Africa.

The third objective helped us understand and identify the expansion strategies that we provided to DMMP. We interviewed three WPI Faculty from the Foisie Business School to gain an understanding of general effective expansion methods. All of the data that we collected from both this objective and objective two was combined into a deliverable we would ultimately give to our sponsor (Appendix J). This deliverable lists the potential organizations, summarizes the key factors, and outlines steps for creating a partnership with the organizations.

3.4.1 Defining Successful Expansion Strategies

Mr. Stitou clarified that “Successful expansion is to see where the program can be implemented especially in the following 2-3 and 5 years, and how can we scale the number of beneficiaries, how can we advocate for girls in STEM and all of this mainly in the MENA region” (S. Stitou, personal communication, 2021). An expansion strategy “is adopted by an organization when it attempts to achieve a high growth as compared to its past achievements” (Business jargon, 2016). With these definitions in mind, we researched and developed strategies for DMMP to expand within North Africa. After interviews with experts we were able to create a list of strategic steps that will help DMMP achieve the growth they seek. The goal of this objective is to produce a deliverable that will aid the successful expansion of DMMP. Additionally, successful expansion will primarily require partnerships with organizations that provide resources as opposed to sponsors that provide monetary support. Mr. Stitou made it clear that funding is not the priority for partnering and that they are looking for organizations whose mission is parallel with DigiGirlz (S. Stitou, personal communication, 2021).

In order to develop our own strategies for expansion based on the information Mr. Stitou had provided us with, we began by examining various databases. We utilized ERIC, JSTOR, Gale and Scopus databases that cover a broad range of topics, such as Science, technology, business and law. We were unable to find any relevant information using a wide variety of key words including: expansion, non-governmental organization(s), nonprofit(s), expansion strategies, growth, development, programs, international expansion, among others, (and some words in conjunction with others); we therefore decided to examine more specific databases. These included Business Market Research Collection, Emerald Emerging Markets Case Studies

Collection, Entrepreneurship Database, and the National Bureau of Economic Research. Using similar keywords, we were still unable to find relevant literature to provide us with useful examples of how NGOs can expand their programs.

3.4.2 Interview with Foisie Business School Experts

Our lack of discovery prompted us to find other resources and methods to develop an understanding of what expansion strategies for NGOs would look like. As one of our team members was familiar with the Foisie School of Business and believed professors there may be of assistance to our team, we reached out to three individuals in hopes of setting up interviews to see if they would have any insight for our project. We interviewed Kenny Ching, Adrienne Hall-Phillips, and Robert Lombardi who are professors and experts in entrepreneurship and business. One team member facilitated the interview, while the other recorded minutes. This directly correlated and qualified them to advise us on how to suggest new partnerships across borders. Our list of questions included expansion strategies for how businesses and organizations grow their brand internationally (see Appendix B.5). The data collected from these interviews informed our outreach methods to international organizations, where we used an email template (see Appendix H.1) to reach out to the organizations detailed in objective two. From this, we interviewed organizations to analyze whether they would be helpful partners to aid in the DMMP expansion plan. In these interviews we asked about their assets, physical presence as well as mission (see Appendix B.4).

The data collected through objective three is the coded minutes from the interviews with possible partner organizations. This data is key in understanding how the organizations we selected could be useful in DMMPs expansion. We extracted the necessary information shown in Appendix E.2 through semi-structured interviews.

3.6 Challenges

There were challenges that came up as we progressed in our project. One major challenge was that the project was being conducted virtually due to the on-going COVID-19 pandemic. Completing our project virtually meant we also had to consider the six hour time difference when setting up meetings and corresponding on WhatsApp and Slack. Another challenge was the

language barriers we faced while getting consent from our research participants, sending surveys that everyone would be able to understand.

Early on, we realized that since we would not be traveling to Morocco there would be a large gap in our knowledge on the context for the project. We worked with Abdelali El-Kassas, our local coordinator for the Morocco site, who facilitated communication with two Moroccan students. To learn more about the social, religious, political, historical, and other contexts, we met weekly with cultural partners, Lamya Chatti and Ayoub El Houssaini. These virtual meetings were a way for us to learn about Morocco in a way that we would have if we had traveled there as originally planned. We learned what a typical day looks like for them in school and outside of school and we learned about their hobbies and passions. We told them about our specific project, asked how much they knew of DMMP, and if there were other organizations similar to DMMP. This provided us the valuable and necessary context to continue progressing in our research.

Mr. Stitou asked for recommendation strategies for expanding their mentorship program throughout the MENA region for the scope of the project. Given the fourteen week time frame we were given and the limitations of our team only being five college students, we carefully decided that it was not feasible to explore all of the Middle East and North Africa region. We limited our proposal to focus on North Africa in our search for partner organizations. By limiting our field of search, it allowed us to collect more information and create stronger recommendations.

It was difficult for our team to develop expansion strategies related to DMMP specifically due the lack of relevant research available. To address this it was necessary to first understand what successful expansion we used souhail vision to guide the question we asked in our interview with the faculty from the Foisie School of Business (See Appendix B.5). With the examples given in the interview we extrapolated steps for creating a partnership that will facilitate expansion.

Chapter 4: Findings

4.1 Introduction

Using data collected from semi-structured interviews, surveys, and web-based and database research, our team learned details regarding the DMMP. That includes their structure, potential partner organizations that adhere to similar missions as DMMP, and strategies for the expansion of the program. Our three objectives guided our methods to arrive at these discoveries and provided us with structured themes to focus on as we conducted research. By adhering to a coding process for our interviews and surveys, and creating a comparison system for the organizations, our team was able to produce a list of potential partner organizations with strategies for expanding the DMMP. We were also able to determine recommendations for improving the DMMP. The following chapter details our data and the analysis that led us to these conclusions and recommendations.

4.2 DigiGirlz Findings

4.2.1 Organization Structure

Semi-structured interviews with past and current administrators of the DMMP provided us with information about the way they function, areas that the program is currently excelling in, and areas where there is room for improvement. We worked to understand the way the mentorship program operates; first, administrators select mentors from a pool of applicants, then mentors have the freedom to choose their own mentees they want to work with. The mentees still have to apply for the program but are selected and interviewed by the mentors in their local communities. Since mentors return to their respective cities after the initial Training of Trainers program, the administration believed it was fair for mentors to select their own mentees since they are not from those areas. This allows mentors to create the most effective partnerships with their mentees and develop meaningful change in their communities.

We also were able to determine that the administration of the DMMP is structured such that the mentors and admins have a very close relationship in the time they work together. This is one of the major strengths of the program. In a typical, non-pandemic year, the Training of Trainers program would occur for two days in Rabat. Mentors would travel from their home

cities and undergo a rigorous training course where they learn essential IT skills for the program, as well as leadership, team bonding, and conflict resolution skills. During this time in Rabat, mentors and administration spend long days together and get to know each other very well. This translates throughout the remainder of the mentorship program, as mentors are able to reach out to admin for help and guidance.

While analyzing the structure of DMMP, our team also uncovered areas where the program has room for improvement. Interviewing prior mentors of the program (Interviewees One and Three) led us to understand that the Training of Trainers program is too intense. There is too much content covered in a very brief amount of time. Mentors are working 8-12 hours a day during this training in workshops and sit through many presentations and speeches from a variety of inspirational speakers and professionals. This system is not an effective way to grasp a large amount of information, while also trying to make meaningful connections with other participants. Mentors do not feel fully prepared to embark on the four-month mentorship program after just two days of training. As Interviewee One stated, “some workshops I was there physically, but not mentally.” Additionally, mentors that had prior coding experience were at an advantage, this is not the case for all incoming mentors though. Some have little to no background in coding and rely on the Training of Trainers weekend to teach them these skills. Having prior IT knowledge is not an established qualification for becoming a mentor and the training process should take this into account. Spending more on the IT and technical courses during the ToT would help those with less knowledge to catch up and be more prepared. To provide the most inclusive training program possible, we have found that this process needs to be expanded in order for all mentors to effectively grasp the necessary information. Splitting the ToT into two weekends for example, would mean less hours spent all at once which could help mentors stay focused. The content would remain the same as in previous ToT weekends but would be spread out more.

4.2.2 The DigiGirlz Impact on Participants

Over the course of the mentorship program, DMMP has impacted over 650 female participants. Both mentors and mentees benefit from undergoing the program. They learn how to effectively lead a team, they gain experience working on IT projects, and they hear about careers in the IT and entrepreneurial fields. Mr. Stitou explained that in the first edition of the DMMP

there were around 450 individual mentor applicants which has grown to around 490 mentor team applications in the fourth edition (see Appendix G.1). The mentor team applicants means that two or three mentors would jointly apply for the application so they could work together. The numbers represent the growth of DMMP over the last four years. Surveys of both mentors and mentees show that DMMP is a formative experience that they would encourage others to take part in. They learn teamwork skills, communication skills, and technical skills too (see Appendix F.1).

We found that overall, mentees had extremely positive experiences in the mentorship program. We were able to see some major themes from our quantitative data in our surveys. More specifically, 63% stated the length of the program was sufficient in order to complete their project. We found that 96% would recommend DMMP to a friend or peer.

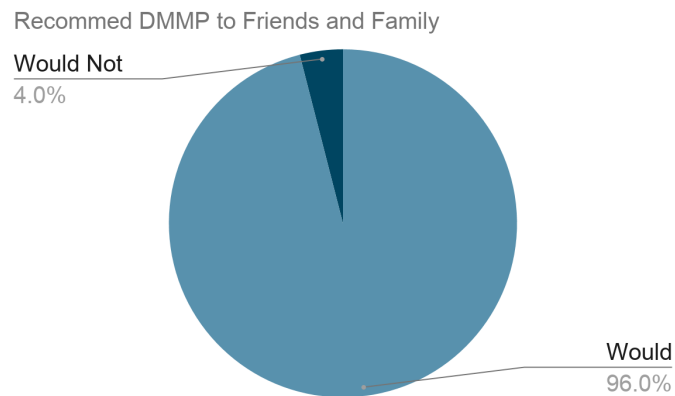


Figure 4: The figure illustrates the ratio of DMMP mentees that responded agree or strongly agreed when asked if they would recommend the program to friends and family.

When asked if the program increased their knowledge in IT, 74% responded “agree” or “strongly agree”. We found that 81% felt there was enough individual attention given to them from their mentors and lastly, 100% of the mentees' most memorable moments in the program were positive. We also found that the national competition at the culmination of the project is very inspirational to the mentees undergoing the program. 26% described this competition as being the most impactful or memorable moment in the program. This competition allowed mentees to showcase their months of hard work, as well as see the projects of other young women from other cities whom they had not worked with. It was clear that those who placed highly in the competition developed a strong sense of pride in their abilities. This was a tangible reward for all of their efforts over the previous months. The mentees who had completed the

program last year and were not able to attend the competition due to the pandemic were disappointed in the cancellation. It was clear that this aspect of the program had a great deal of impact on the mentees.

A unique aspect of the program is that both mentors and mentees not only learn IT skills, but develop crucial soft skills, too. We heard from three past mentors in interviews with them and noticed how great of an experience DMMP was for them. We found that these soft skills were extremely beneficial and created a lasting impact among participants. Interviewee Three stated that she still remembers all of the leadership workshops she went through during her mentor training, where she met influencers while learning how to use social media effectively as a leader. Interviewee Two stated that she created lasting connections with other young women while learning about various aspects of community service during training. She was also introduced to aspects of business and entrepreneurship through the program and is interested in pursuing that field further; she even learned how to give an “elevator pitch” which can help in further professional settings (see Appendix G.5). Learning simple skills like how to work and study hard was also very impactful for participants, since students do not always learn these skills from universities. We found that learning about conflict resolution skills and how to deal with group dynamics provided mentors with necessary tools to effectively lead their teams as well.

As we examined our collected data, we found that DMMP is successful in closely following their mission of supporting and empowering women in IT fields. Interviewee Two explained that IT is still very much a male dominated field. Women often feel that they have to prove themselves in order to be in this field. She strongly believed that it is crucial that girls in North Africa are confident in their abilities and potential, and understand that fields like IT and engineering are not just for men; she feels that DMMP is doing a great job of bringing awareness to this issue and building up women’s confidence to pursue those fields. Interviewee One, who had undergone the program as a mentee as well as a mentor, was very passionate about empowering women in her local community and giving back to those that had afforded her the opportunity beforehand. She felt that completing the program as a participant increased her confidence in her own abilities and wanted to do the same for others. Additionally, mentors felt that they were making a real difference in mentees' lives, which in turn provided them with a strong sense of empowerment and accomplishment. Interviewee One even stated, “I felt like I

was a grown up finally,” as she grew her problem-solving abilities. The program led her to pursue computer science in school. We also found that the DigiGirlz mission was understood and embodied by mentees, too. Mentees felt empowered and encouraged by the program. Many had a continued desire to learn about IT and science, and felt confident and able to do so.

4.2.3 Challenges

The pandemic has not only affected our ability to conduct research, but also it has also reshaped the way participants in the DMMP interact with each other. The need for all of the mentees and mentors to meet virtually with each other is one of the biggest changes as a result of the pandemic. This has made the job of the mentors more difficult as they work to keep mentees engaged in the work they are doing. Following the initial onset of COVID-19 regulations the mentorship program was postponed for two months, which Interviewee Three referred to as a “warriors rest”. This phrase is a reference to the fact that the girls in the program had their work put on pause while DMMP developed solutions. Upon resuming the program there was a consensus among mentors and mentees that the motivation and commitment to the project had wavered following the break. Interviewee Five had mentees quit forcing her to hold a truncated application process to find participants to fill the opening. In prior DMMP editions, individual mentees and in some cases entire teams have tried to leave the program before its conclusion. The reason often being outside commitments, such as school taking precedence over the program. Our sponsor made it clear that the DMMP is not more important than school. They are ultimately in search of students who are willing to put in all of the necessary time to complete the work and reap the benefits of the mentorship program.

During the pandemic mentors would generally prefer to meet with their mentees using Google Meet although this was not always feasible. In some cases students had difficulty accessing the internet due to connectivity problems or not having a computer, which makes meeting virtually difficult (see Appendix F.2). When it was not possible to use virtual communications platforms, like Google Meet teams met using Instagram live and Facebook. These are popular social media sites among many of the participants and could be easily accessed on a mobile device that mentees were more likely to have access to. This was only a short term solution and was not found to be a significantly more effective fix to the

communications problems as a result of the pandemic.

4.3 Potential Partners

4.3.1 Locations

After narrowing our search for potential partners to North Africa we were still left with eight countries and almost 12 million square miles to search. With the help of Professors Moody and El Hamzaoui we narrowed our search further to focus on Algeria, Egypt, Libya, and Tunisia. They advised us by suggesting these locations based on their knowledge of North Africa and the political climates of those regions. We learned from interviews with the Foisie Business School Professors that as we are recommending organizations in other countries we need to conduct background market research on those regions. We found that similar to Morocco there is enough internet accessibility and education infrastructure in these countries (See Appendix G.10, G.11 and G.12) to support the mentorship programs' arrival. It is also possible to attract participants using social media and school visits the way it is currently done to raise awareness. Algeria, Tunisia, and Libya were also singled out for having interest in the DMMP as Souhail mentioned that there was an application from each in the third and fourth editions. This demonstrates the interest for a program like DMMP in those countries.

4.3.2 Partner Organizations

Our team was able to assemble a potential partners list consisting of fourteen organizations that fit the criteria we set. The key factors we used were the type of organization, network, purpose, location, expansion strategies, and challenges (see Appendix E). These allowed us to differentiate between the hundreds of NGOs, schools, and government entities in North Africa. From interviews with our sponsor we learned that he was not looking solely for money from partners, but rather a dedicated team with a similar mission to DMMP (see Appendix G.1). Ideally, the partnering team would be able to source the staff and participants to start and maintain a new project center in the selected city.

We compiled into a table how each of the fourteen organizations addressed our criteria and the necessary contact information to set up interviews (see Appendix E.2). We shared our final list with Mr. Stitou and he commented on the aspects of each organization that interested him. He highlighted SheCodes for doing similar teaching app building to its participants and

Algerian Women in Science for the mentorship program they developed. We learned from hearing his comments what aspects of the organizations weighed more heavily in his eyes. He was interested in the partner organizations that our potential partners already have and what those partnerships look like. After reviewing the list with Mr. Stitou, we began reaching out on social media platforms and learned additional information from interviews with the three who responded to our outreach. During this process we found that it required messaging organizations on three different platforms, sometimes multiple times, in order for them to notice us and respond. In the interviews with AWTAD, Algerian Women in Science, and SheCodes we learned more about how their missions were similar to DMMP and how enthusiastic they were about creating a partnership. We found that AWTAD's expertise in training leaders could aid DMMP in helping their mentors gain a better understanding of the technical skills. Most closely related to the DMMP is SheCodes whose work with high schoolers offer a chance for direct improvements to the workshops and projects completed by the current mentees.

4.4 Strategy Findings

4.4.1 General Expansion

The term expansion is very broad and can refer to many different aspects of an organization's plans to grow. In order to classify successful expansion we had to get a concrete definition of how the DMMP envisioned themselves expanding. In correspondence with Mr. Stitou we learned it meant partnering with organizations in the MENA region and reaching more beneficiaries for them. Once we understood the growth that the program is trying to achieve it informed the questions for our interviews with Foisie Business School professors. WPI Professor Adrienne Hall-Phillips shared the importance of DMMP understanding the markets that they choose to move into. The internet connection, infrastructure, and communities of learning are all areas to understand when looking for similarities to another country (as seen in Appendix G.7). Given all of the beneficiaries DMMP is currently responsible for it is not ideal for them to perform menial tasks from across borders. Part of the criteria for choosing a partner is that they can manage multiple teams and coordinate workshops and events.

It is important to the success of a new project center to sufficiently promote the organization and interest in reaching more beneficiaries (see Appendix G.8). DMMP does a great job of staying active on Facebook and Instagram and it has worked as free advertising for the

organization (see Appendix F.2). Utilizing social media, especially during the COVID-19 pandemic, will help DMMP with creating new partnerships so other organizations can see what DMMP is doing and what feedback they get from that.

4.4.2 NGO Expansion

After learning what expansion means for DMMP it became clear that strategies meant for corporate businesses would not necessarily work. This is because most of them generally apply to private businesses whose goal is to increase profit by growing into new markets (Ching, 2021). We differentiate between the two in order to provide the appropriate techniques for creating partnerships and increasing beneficiaries. If this was a corporate finance issue WPI Professor Kenny Ching, from the Foisie Business School, explained to us that he would recommend trying to gain leverage by borrowing money needed to set up a new location to hire staff. This is not a viable option for DMMP as mentioned in the previous chapter, they follow a strict funding budget so they would not have access to disposable capital of that scale. Given a limited budget the money must be used strategically on maintaining the current infrastructure rather than risky moves outside of the country. Instead, negotiating a partnership that equally benefits both parties in terms of resources and publicity makes more sense. This is similar to the way large corporations fund charities and other NGOs as a form of marketing.

The need to understand the communities in which you hope to enter is important to every organization or business regardless of the purpose. Having the support of local governments and civilian groups can be the difference between success and failure. We needed to understand how people will react to the service that is being provided. This demonstrates the importance of knowing the audience and it affects where and why the initial location of the first international DMMP will be located.

4.5 Conclusion

To provide the DMMP with recommendations and deliverables our team utilized several research and data analysis techniques. We were able to substantiate our findings by conducting interviews and surveys for all of the objectives. In analyzing survey data for mentors and mentees the quantitative data showed us where DMMP needs to place more emphasis in the education of its beneficiaries. It also presented us with data supporting the success of the current

work, such as attracting participants through speaking engagements and social media. The interviews with mentors provided qualitative data, which allowed us to dig deeper into the themes we saw emerging. We found the ToT weekend was overwhelming and time consuming, the mentors enjoyed getting very close with admin and other presenters/speakers throughout the program, and they learned many skills such as conflict resolution and leadership as well. This was the same for interviews with the DMMP administration. In these, we learned that the administrators enjoy getting to know many of the mentors and they want to stay connected to support them in future endeavors.

As we moved into objective two, we developed a strong list of potential partner organizations that we reached out to. After setting up interviews with three of them, we met and learned in more detail what the organization is structured like, what types of programs they run, and what types of partnerships they had or have. We then coded these interviews and used our key factors as criteria for how compatible each organization would be with DMMP.

Lastly, we met with Foisie Business School Professors and researched what expansion looks like for NGOs and found a set of strategies to recommend for DMMP when expanding. The definition we came up with at the end for expansion strategies “is adopted by an organization when it attempts to achieve a high growth as compared to its past achievements” (Business jargon, 2016). For recommendations for DMMP expanding their program we determined a list of five strategies that would be best to use. The list includes, complete thorough market research in countries/areas of interest, identify and reach out to potential partner organizations, develop legal status in new countries, define complementary roles and responsibilities, and lastly, focus on shared impact from both organizations.

Chapter 5: Conclusions & Recommendations

5.1 Introduction

Our team goal was to provide DMMP with recommendations for expanding their mentorship program throughout North Africa. This goal aimed to assist DMMP with their mission to create opportunities for young women in Morocco to become leaders in their communities and have successful careers in IT. As the program continues to expand throughout Morocco, their influence has reached beyond the borders as they receive international applications from countries such as Algeria and even Ukraine. The research we conducted helped us determine the effectiveness of the current DMMP and we learned if and how they can expand throughout North Africa. The work we completed, detailed in our Methodology, helped us find potential partners and create recommendations for successful expansion. Analyzing interviews and surveys allowed us to understand how mentors, mentees, and administrators viewed the current DMMP, as well as identify where the benefits, strengths, and weaknesses of the program are. Further research and expert interviews provided insight on the nuances of expansion as it pertains to non-profit organizations. The recommendations that we provided will help DMMP reach more beneficiaries and support the DMMP mission to address the gender gap in the IT workforce.

5.2 Recommendations

This chapter details our recommendations supported by our findings. These recommendations can be broken down into three categories: improvements to the DMMP, recommended potential partner organizations, and strategies for implementing expansions. To improve the current DMMP, we recommend expanding the Training of Trainers program, as well as encouraging a more hands-on administration to check in with both mentors and mentees throughout the program. We recommend DMMP look into partnering with Algerian Women in Science, AWTAD, and SheCodes, among other North African organizations (these can be found in Appendix J). Finally, we recommend DMMP follow five expansion strategies to help them best grow.

5.2.1 DigiGirlz Program Recommendations

At the conclusion of analyzing our data, we were very impressed with the overwhelming positive aspects of and responses to the DMMP. However, there is always room for improvement. Prior to beginning expansion, we recommend that DMMP make some alterations to their current operation. We recommend expanding the Training of Trainers program to be one week long with various sessions throughout the week. Sessions can be held simultaneously, and mentors can have the ability to choose which sessions they wish to attend at a given time. We also suggest holding various levels of technical IT skill training to accommodate for the varying levels of knowledge that mentors have coming into the program. This would ensure that mentors with extensive prior knowledge are not bored and can focus their time elsewhere, and mentors without as much prior knowledge can grasp these skills before they must teach them to others.



Figure 5: Mentors Receiving training during ToT 2020

Ideally, ToT should also occur in person, as that will have the most impact on participants. Based on interview data collected, virtual ToT was not as helpful or informational to mentors. Additionally, we recommend recording these sessions, and putting them in an online depository (such as a private Facebook group). Any mentors who were not able to attend or needed to miss a session for any reason would not be put at a disadvantage, being able to view these videos when they are posted. Specifically for mentors with minimal or no prior IT experience, it would be extremely valuable to have a source they can refer to in the future. We suggest keeping all of the important content found in the current ToT program, just spreading it out over the course of one week and in various sessions. Making these changes would allow the ToT program to be more inclusive to mentors with varying levels of IT knowledge, and would be more impactful overall as participants would not feel rushed through the training.

We also recommend administrators check in with both mentors and mentees throughout the duration of the mentorship program. As we found through interviewing prior administrators

and mentors, admins and mentors get to know each other well in the few days they spend together in ToT. However, administrators do not play a large role in ensuring everyone's experiences are going well and are successful throughout the rest of the program. Providing feedback forms or other routes of communication such as Facebook or WhatsApp groups for administrators and mentees to communicate would allow for mentees to have their voices heard, and administrators to make stronger connections with participants.

5.2.2 Partner Recommendation

There is no shortage of impressive organizations that are doing powerful work in empowering various audiences, including women, youth, and lower-income people. However, the DMMP mission and purpose is so essential to the program that we wanted to ensure the organizations we would recommend would not veer off from those core values. Through our research, we were able to narrow down a list of 14 organizations in North Africa that we believe to be viable partner organizations. The top three we suggest are Algerian Women in Science, Association for Women's Total Advancement and Development (AWTAD, based in Egypt), and SheCodes (based in Libya). Each of these organizations have similar missions to DMMP, and differ enough that both partners would be able to grow their programs by working together. The following paragraphs detail more information about each recommended organization.

Association for Women's Total Advancement and Development (AWTAD) is a mentorship program located in Cairo, Egypt whose mission is to economically empower women and youth (AWTAD Home, n.d.). Their program began as an NGO in 2008, and was one of the first Egyptian mentorship programs launched in 2009. By building bridges between women who have experience in professional spheres and those that do not, other women and youth can learn about business, entrepreneurship, management and marketing, ultimately leading to economic freedoms (S. Allam, personal communication, 2021). AWTAD's mentors each receive a manual and a three-day training. There is an application process for mentees, which they have also been able to adjust to accommodate rural participants who do not have internet access, but about 70% of their applications are online. Mentors and mentees work together for 2-3 months, and their mentees are typically 13-19 years old. In terms of expansion, AWTAD wants to grow more impactful; they are less concerned with making money than they are with reaching more beneficiaries. They are also looking to add more IT related content to their program, and DMMP

content would likely be a huge asset in this sense. AWTAD excels in the organization of their mentorship program, and their 11 years of expertise would be helpful to DMMP as they ultimately expand in size. We recommend a partnership with AWTAD, as both organizations would benefit from one another.

Algerian Women in Science (AWIS) is a significantly newer NGO, which began in April of 2020. Their mission is to provide successful female role models and mentors in the STEM field for university-aged women interested in pursuing STEM careers. Though they are a young organization, they are led by a team of highly qualified and motivated women, and have already secured partnerships with various scientific start-ups. They have already registered 200 members. As AWIS began in the midst of the pandemic, they are very facile with virtual communication, and run their entire program remotely. This extensive virtual network can ensure their longevity and provide security that they can connect with their beneficiaries all over the world, regardless of physical location. As AWIS is a new organization, their goals for expanding and working with potential partners include growing their audience and gaining more funding. They also hope to gain legal status as an NGO in Algeria so they can ultimately operate in a physical space. AWIS' strong virtual communication plan and global mindset would be an asset to DMMP, as some of their major challenges arose due to virtual communication after the pandemic hit. Since DMMP is also looking to expand internationally, AWIS may provide them with helpful suggestions to enter into a global market, since they have been able to reach women all over the world; they connect professional Algerian women around the world as part of a network of experts to provide technical support. AWIS is not an IT-specific program, instead it focuses holistically on STEM. DigiGirlz' growing audience and IT-related content would likely be beneficial to their overall program, and the successful partnerships and funding DMMP has secured can serve as a guide for AWIS, too. We recommend a partnership with AWIS, as they would be able to assist DMMP in expanding internationally, and DMMP could provide their experience and knowledge of growing their program year after year as AWIS looks to impact more women.

SheCodes is an NGO based in Benghazi, Libya looking to specifically empower women in IT and make these fields more attractive to young women. Their mission is to provide young women with the knowledge and information to successfully enter technology fields in the future. As these fields are seen as predominantly male in Libya, SheCodes hopes to encourage women

that there is a place for them in these fields, too. Similar to DMMP, their administration is led by a small, young, and highly competent team. SheCodes provides a thorough curriculum to teach women about the IT field, and has programs including SheSeries (with two sub-programs, SheDesigns and SheDevelops) and eKids, targeted more towards children. SheSeries encompasses many different topics, including mobile app and website development, graphic design, market research, economics, and professional writing. The eKids program (for girls aged 5-16) is led by teaching assistants from local schools, who have developed a curriculum targeted specifically to each age. This ensures participants are receiving information that is on par with their abilities, and that no one becomes bored by how easy the program is or disheartened by its difficulty. They've reached girls and women aged 5-35, and have gained a lot of attention from high school students specifically. This age group provides a sufficient audience for DMMP, as well. SheCodes' program is more curriculum and assignment driven, where participants receive education on the aforementioned topics and then complete different assignments independently. DMMP prides itself on their project development process and group work. The combination of these two aspects would create an even stronger program in a potential partnership. SheCodes administrators hope to work with organizations whose leaders also have a background in IT, which would make DMMP a great fit, too. SheCodes also hopes to create a cyclical program where students are so inspired by SheCodes that they come back and become ambassadors, which DMMP has seen in their past editions, too.

Each of these organizations would benefit from a partnership with DMMP, and DigiGirlz would be able to expand their audience and program by connecting with these organizations, too. We recommend referencing the deliverable in Appendix J to find further contact information for each organization outlined in this section. Templates for contacting these organizations can be found in this deliverable, as well. These three organizations have significant potential for creating long-lasting and impactful partnerships with DMMP.

5.2.3 Expansion Recommendation

As outlined in our Methodology chapter, we embarked on researching strategies that are commonly used by non-profits or NGOs that wish to expand their reach. After discovering a lack of available information on NGO expansion and ultimately turning to professors of the WPI Foisie School of Business, we were able to determine what expansion might look like for NGOs.

Based on our findings from coding these interviews, we developed a set of strategies for DMMP to use in order to expand their program internationally. These strategies can be broken down into a list of tangible steps, as follows:

1. Complete thorough market research in countries/areas of interest
2. Identify and reach out to potential partner organizations
3. Develop legal status in new countries
4. Define complementary roles and responsibilities
5. Focus on shared impact from both organizations

The role we played throughout our project somewhat completed steps one and two of these strategies. As mentioned in our Methodology and Findings chapters, we developed a list of key factors to determine if potential partner organizations would be compatible with DMMP. This included ensuring there was a sufficient audience for the program in locations we were considering in North Africa, which we were able to determine based on interviews with potential partner organization administrators. Additionally, we began the process of identifying and reaching out to potential partner organizations, as outlined in Section 3.3.1. As we were only examining the North Africa region, we recommend investigating potential partner organizations in the greater Middle East region, as well. When identifying potential partners, it is imperative to consider the market they serve; as Professor Hall-Phillips, an associate professor at the WPI Foisie School of Business, explained, this can include learning about the given region, their infrastructure, and their capabilities for partnering. More specifically, “consider internet access, day-to-day life and whether or not that area is conducive to DigiGirlz as a program community,” (Hall-Phillips, personal communication, 2021). We considered these aspects while determining viable partners and suggest continuing to do so if there is a desire to examine other regions or organizations.

Developing legal status in new countries of interest is an important step for NGO expansion, which involves clarifying their purpose within the new region. There are international expansion experts who will be able to assist DMMP administrators in finding legal counsel in the new region in order to ensure the rules and regulations of the new country of interest are being taken into consideration and followed correctly. One such expert is Blueback Global, who assists with international expansion solutions across all continents. Legal status is important to establish in new countries, in order to begin basic operations including employing staff, renting offices,

and opening bank accounts if necessary (Global Expansion, 2020). We also recommend pursuing legal status in new countries to be able to secure new avenues of funding, which we had discussed with the founder of Algerian Women in Science, as she was unable to secure funding for the organization until developing legal status in Algeria (Appendix G.10).

We further recommend creating well-defined roles and responsibilities amongst the administration team. As Professor Ching, an assistant professor at the WPI Foisie School of Business, explained, ambiguity is very tough to deal with, and typically leads to problems in completing tasks effectively (Appendix G.8). Ensuring that the administration team is organized and has clear roles will provide the most straight-forward expansion process as possible. We suggest assigning specific roles to current administrators or hiring new staff to focus solely on expansion-related tasks. These tasks may be delegated in various ways. For example, each employee could focus on overseeing partnership and program implementation in one specific country at a time. Alternatively, one employee could be in charge of potential partner organization outreach and communication, while another focuses on developing program curricula, and others consider gaining legal status in new regions. While there are a myriad of ways to delegate these tasks, we overall recommend keeping these distributions clear and organized to combat potential ambiguity and ensure all necessary items are completed.

Finally, an important aspect of successful partnerships and ultimately DMMP expansion is a symbiotic relationship between partners. While this is a biological term, it can apply to businesses and organizations, too. Specifically, “each partner provides and extracts value to the other partner. In the most ideal symbiotic relationships, the value extraction is at no cost to the other partner,” (Aders, 2013). For DMMP and a potential partner, this means that each organization will provide benefits to the other without compromising each one’s inherent mission or goal. We have determined that DMMP is already making an impressive impact in Morocco and partnering with other organizations will only increase this influence (Expand Your Impact, 2011). To ensure the longevity of these partnerships and ultimately their societal impacts, there needs to be an emphasis on the combined impact the two organizations make together.

5.3 Project Deliverable

We presented our findings to DigiGirlz as the final stage of this objective. We created an interactive PDF that guided our sponsor through (1) organizations that they could partner up with and (2) strategies to reach out to those organizations. We created a deliverable using the data we had collected in objective two and objective three. More specifically, data from objective two included interview responses with potential partner organizations and research conducted on these organizations as well. Objective three data is collected from interview responses with the WPI Foisie Business School professors. The purpose of this deliverable was to present DMMP with our final conclusions from all our work done since we started this project in November 2020.

The deliverable lists the organizations that we interviewed and declared as compatible with the DMMP. These are recommendations for forming a partnership. They are displayed on a map of the North Africa region with each name hyperlinked to a page with more details. Each organization has a page that provides more specific elements such as mission, past and current partners, and their infrastructure. This explanation provides DMMP with a basic understanding of what each organization is about. The second main aspect of the deliverable is what particular methods and strategies DMMP should use to establish a partnership with a new organization. These five steps as described in Section 5.2.3 are explained in further detail in the deliverable as well. Although there were organizations that did not respond to us to set up an interview, we included the entire list we originally composed in the deliverable.

5.4 Conclusion

At the culmination of our data collection and analysis, we were able to provide DMMP with recommendations to improve their current program, provide potential partner organizations, as well as other steps they may take to expand the program. By adhering to these steps and reaching out to new organizations, DigiGirlz can begin solidifying their presence in the North Africa region, and ultimately the greater Middle East. This expansion will help empower women across the region to be confident in their abilities, and ultimately create a lasting impact in increasing the number of women in the IT field across the globe.

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Appendix A

A.1 Consent Form for Interviewees

We are a group of students from Worcester Polytechnic Institute (WPI) in Massachusetts. We are conducting an interview of _____ to learn more about the DigiGirlz Morocco mentorship program. This research will be used by Association Anoual and the DigiGirlz administration team in order to expand their program into other countries in North Africa.

Your participation in this survey/interview/focus group is completely voluntary and you may withdraw at any time. Please remember that your answers will remain anonymous. No names of identifying information will appear on the questionnaires or any of the project reports or publications. If you are interested, we can share a copy of our results with you at the end of the project.

For more information about this research, contact gr-DigiGirlzC21@wpi.edu or IRB Manager at WPI (Ruth McKeogh, Tel. 508-831-6699, Email: irb@wpi.edu)

A.2 Parental Consent Form for Minors

Contact Information: Worcester Polytechnic Institute DigiGirlz Morocco IQP Project Team

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Title of Research Study: *Developing Expansion Strategies for DigiGirlz Morocco Mentorship Program*

Sponsor: *Project Sponsor:* Association Anoual's DigiGirlz Mentorship Program
Project Primary Contact: Souhail Stitou, Vice-President
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Introduction: Your child is being asked to participate in a research study. Before you agree, however, you and your child must be fully informed about the purpose of the study, the procedures to be followed, and any benefits, risks or discomfort that your child may experience as a result of her participation. This form presents information about the study so that you may make a fully informed decision regarding your child's participation.

Purpose of the study: This study will determine the feasibility of the expansion of the DigiGirlz Morocco Mentorship Program. We will be assessing how DigiGirlz Morocco's mentorship program is structured, locating viable partner organizations in North Africa, and developing a feasibility study for how and where DigiGirlz Morocco may expand their mentorship program. To assess the DigiGirlz Morocco program, we will be conducting interviews and surveys with prior mentees and mentors of the program. This part of our project is where we request participation from your child, who can provide us with their firsthand experiences in the DigiGirlz program.

Procedures to be followed: Our team will be working closely with our sponsor, Souhail Stitou, regarding communication between our team and your child. All communication you receive will be directly from Mr. Stitou. There will be two main aspects to your child's participation in our research, as follows:

1. Your child will be asked to fill out a **survey** related to their experiences in the DigiGirlz Mentorship Program. This will be conducted through a WPI Qualtrics Survey, and the link will be sent via email to your child by our sponsor, Souhail Stitou. Your child will have five days to complete this survey once they receive it, and it will take 15-30 minutes to complete. Survey responses will remain entirely anonymous, and will be recorded in a WPI OneDrive document accessible by our team and our advisors. Participants may skip any question they do not wish to answer.
2. We will be conducting online **interviews**, through use of the Zoom platform. These interviews will be semi-structured, with a list of questions established prior to the interview. These questions will specifically be in regards to the participant's experiences in the DigiGirlz program. You are welcome to join your child on this Zoom, to ensure all participants are comfortable throughout the process. These interviews will not be recorded, and any data collected from these interviews will remain anonymous. Participants may skip any question they do not wish to answer.

By checking this box, you consent to your child's participation in online interviews conducted by our team on Zoom.

Our team and sponsor will be in communication with your child between the dates of February 10th, 2021, and March 5th, 2021. You or your child will not be contacted outside of this timeframe. Additionally, a list of all survey and interview questions your child may be asked can be found at the end of this document in both English and Arabic, on page 5. Participants are not required to prepare answers in advance to these questions, but they may do so if they feel more comfortable.

Risks to study participants: Minimal risk. Potential for participants' uncomfotability in sharing opinions that may seem unfavorable or negative. There is no physical or tangible risk to participants' involvement.

Benefits to research participants and others: There are no benefits to research participants and others.

Record keeping and confidentiality: Records of your child's participation in this study will be held confidential so far as permitted by law. However, the study investigators (listed at the top of this document), the sponsor or it's designee, the project advisors and, under certain circumstances, the Worcester Polytechnic Institute Institutional Review Board (WPI IRB) will be able to inspect and have access to confidential data that identify you by name. Any publication or presentation of the data will not identify you. All records will be kept on our WPI OneDrive platform. Any response a participant provides will be copied into a document, omitting any names or identifying information. Zoom interviews will not be video or voice recorded, notes will be taken by the interviewers for record keeping. Unless otherwise stated, all responses a participant provides may be used as data by our team, and may be published in our final report.

Compensation or treatment in the event of injury: This study poses no risk of injury or harm. You do not give up any of your legal rights by signing this statement.

For more information about this research or about the rights of research participants, or in case of research-related injury, contact: any researcher listed at the top of this document, or you may contact our group alias, gr-DigiGirlzC21@wpi.edu. Additionally, you may contact the IRB Manager (Ruth McKeogh, Tel. 508 831- 6699, Email: irb@wpi.edu) or the Human Protection Administrator (Gabriel Johnson, Tel. 508-831-4989, Email: gjohnson@wpi.edu).

Your child's participation in this research is voluntary. Your child's refusal to participate will not result in any penalty to you or your child or any loss of benefits to which you or your child may otherwise be entitled. Your child may decide to stop participating in the research at any time without penalty or loss of other benefits. The project investigators retain the right to cancel or postpone the experimental procedures at any time they see fit.

Withdrawing from the study: Should a participant wish to withdraw from the study after it has begun, the following procedures should be followed:

1. Contact any of the listed members under the “Contact Information” Section at the top of this document.
2. State participants desire for withdrawing from the study
3. We will cease all contact with the participant, and ensure any data received from participant is removed from our records will not be used in our research/final report

There are no consequences for early withdrawal for the subject.

By signing below, you acknowledge that you have been informed about and consent to your child being a participant in the study described above. Make sure that your questions are answered to your satisfaction before signing. You are entitled to retain an electronic/physical copy of this consent agreement. Any typed name serves as a signature. By signing below, you certify that any electronic signature is that of the person signing it.

Parent Signature: _____

Date: _____

By signing above, you attest that the typed name is that of the parent of the child who will be participating in the study.

Study Participant Signature: _____

Date: _____

Signature of Person who explained this study: _____

Date: _____

Appendix B

B.1 - Sponsor and Administration Interview Questions

1. Tell us how you would describe the DigiGirlz brand and its influence.
2. How does DigiGirlz currently advertise the program? (social media platforms, physical presentations, university notices)
3. What is the leadership structure within DigiGirlz?
4. How many applicants have you had in each edition (year) of the program?
5. How are mentors/mentees chosen?
 - a. What are the credentials you look for?
 - b. How do you determine who to accept?
6. Can you tell us more about the mentorship training process?
7. Is there a system you use for matching mentors and mentees together?
8. Can mentors be mentors for more than one year?
9. What are the program's strongest areas, and what are some of its weaker areas?
10. What is something unique about the DigiGirlz Program?
11. What impact has COVID-19 had on the program?
12. What type of organizations do you envision working with in North Africa? Universities? NGO's?
13. What strategies do you use to network with other organizations?
14. For Souhail specifically: What were some useful strategies that you used in creating partnerships with 2M, Capgemini, and Expertise France?
 - a. What did you learn from these?

B.2 - Mentor Interview Questions

- 1. Developing an understanding of the mentor application process**
 - a. Which edition of the program were you involved with?
 - b. How did you find out about DigiGirlz?
 - c. How did you find out about the mentorship program application?
 - d. What made you want to apply?
 - e. What was your favorite part of being a mentor?
 - f. Did the DigiGirlz Mentorship Training program properly prepare you for the role of being a mentor?
 - i. What did this preparation include?
 - ii. What did you learn in the training program that you still remember and use today?
 - g. Were you paired up with one or more mentees? Were you the only mentor in the team?
- 2. Understanding the impact**

- a. Has DigiGirlz made you want to learn more about the IT fields?
 - b. Would you want to get a job in those fields?
 - c. Did DigiGirlz Morocco help you find a job or internship?
- 3. Challenges**
- a. Did you face any challenges as a mentor?
 - i. How did you overcome those challenges
 - b. Did your mentees face any challenges?
 - i. If so, how did you assist them?
 - c. What is one thing you would like to change about the mentorship program?
- 4. Additional Questions**
- a. Would you encourage any of your friends/family/peers to apply? Why or why not?
 - b. Would you want to continue being involved with DigiGirlz if you could? If so, how would you like to do this?
 - c. Is there anything else you'd like to share with us and what you learned with DigiGirlz or your experience?

B.3 - Mentee Interview Questions

- 1. Examining DigiGirlz' visibility**
- a. What edition of the program were involved?
 - b. How did you find out about DigiGirlz?
 - c. Why did you join the program?
- 2. Understanding the DigiGirlz program from Mentees' point of view**
- 1. What was your favorite part of the DigiGirlz program and why?
 - 2. What was your project? Explain.
 - 3. What was the hardest part of the mentorship program and why?
 - 4. Has completing the DigiGirlz program helped you in your schooling? If so, how?
- 3. Understanding impact in subject fields**
- 1. Have you participated in an IT project or a course prior to joining DigiGirlz?
 - 2. What are some things/skills you learned in DigiGirlz that you did not know before?
 - 3. Since being in DigiGirlz, have you thought about majoring in computer science at a university?
- 4. Considering DigiGirlz' sustainability**
- 1. Would you consider applying to be a mentor for the program in the future, after having gone through the program as a mentee?
- 5. Challenges of the current program**
- 1. What was your experience like going through the program remotely? (if they had gone through the program post-Covid)
- 6. Wind down:**
- o Would you recommend the DigiGirlz program to a friend/peer? Why or why not?

- Is there anything else you want to share with us about your experience in DigiGirlz or what you learned?

B.4 - Potential Partner Organization Interview Questions

- 1. What is your mission/purpose?**
 - a. Can you describe who your organization is geared towards helping?
 - b. Are there other groups who also may benefit
 - c. Who is your target audience?
- 1. What do you expect the organization to look like in the next 3-5 years?**
 - a. Do you have any plans for reaching more beneficiaries?
 - i. Who are these beneficiaries?
 - b. Have you taken any steps to improve the organization?
 - i. Can you describe what they were and why you took them?
 - ii. Do you use social media?
 1. How do you use it to your advantage?
- 2. Do you have a physical location?**
 - a. If not, how is your program structured to interact with participants?
 - b. If so, can you describe the physical building the organization is based in?
 - i. Do you have a reception, main lobby area, classrooms, one large hall, etc.?
 - ii. Can this space accommodate group events? (How large are these groups? Numbers?)
 - iii. What is this space's purpose? How is it used?
 - iv. Do you have access to materials/equipment such as high-speed internet and computers?
- 3. How many people do you staff in your organization?**
 - a. Are they mainly volunteers?
 - i. If not, is there a budget to pay workers?
 - b. How did you find employees
- 4. Is there a board (trustees, director, treasurer)?**
 - a. Does the organization work on multiple projects at once?
 - b. If yes, do you all work on the same project at once?
 - i. If they have multiple projects how many?
 - ii. How do you delegate the work?
 1. Can you describe how your staff works on different projects?
- 5. How has Covid affected any of your programs?**
 - a. Have you moved to more virtual activities?
 - b. Have you made other changes as a result?
 - i. Are any of these changes permanent?
- 6. Have you partnered with organizations or groups/people in the past?**
 - a. What types of organizations?

- b. How many?
 - c. Where were your partners located (local/ international)?
 - d. Can you describe what that partnership looked like and what it included.
 - i. Did you provide them with any resources?
 - ii. If so, what were these resources and how were they used?
 - iii. What resources did they provide to you?
 - iv. Are you still currently partners?
 - v. If not, why?
 - vi. What challenges did this partnership present?
7. **Are you open to future partnership opportunities?**
- a. If so, what do you look for in a partner organization?
 - b. Are there particular aspects of your organization that you are looking to expand/improve?

B.5 WPI Foisie Business School Professor Interview Questions

1. From what we shared about DigiGirlz with you, do you have any questions about how they operate or what our role is in this project with them?
2. How would you define the term expansion?
 - *Our sponsors definition is: "For [DigiGirlz], expansion strategies are to see where the program can be implemented, especially in the following 2-3 and 5 years, how can we scale the number of beneficiaries, how the project can advocate for girls in stem, and all of this mainly in the MENA region or Africa in general" → the beneficiaries are the mentors and mentees*
3. What are some successful expansion strategies that businesses and organizations use when growing?
 - Do these strategies look different for international growth? Do they look different for NGO (non-profit) vs. big corporations or wealthy businesses?
4. What is the difference between expanding as an NGO vs. a business/corporation?
5. For us reaching out to international organizations, how would you recommend we initiate contact with these potential partners?
 - How could we attract the attention of these organizations as students?
6. **share screen and show interview questions for organizations** Could you provide any recommendations for how we could phrase some of these questions?
7. Have you been a part of anything similar to what our group is attempting to do?
8. What advice can you give drawing from your experience with companies/businesses/NGOs expanding? What have you noticed worked well or did not work well?
9. Are there any sources that could be helpful to our research?

Appendix C

C.1 - Mentor Survey Questions

Multiple choice:

1. What edition were you a part of?
2. How or where did you hear about the DigiGirlz program? (short answer)

Yes or No responses:

3. Have you participated in an IT project or a course prior to joining DigiGirlz?
4. Were you a mentee before being a mentor?
 - If so, what year were you a mentee?

Scaled Questions (on a scale 1-5, 1 being strongly disagree and 5 being strongly agree):

5. I felt prepared to be a mentor in the DigiGirlz program.
6. I want to get a job in the IT field.
7. I would recommend DigiGirlz to a friend/peer.

Long Response:

8. Why did you join the DigiGirlz Mentorship Program?
9. What did you think of the application form?
 - Clarifying: Did you like or dislike the application?
10. What was the most impactful or memorable moment with DigiGirlz?
11. What would you change if you were in charge of DigiGirlz?
12. Is there anything else you want us to know about your experience in the DigiGirlz program or any additional comments?

C.2 - Mentee Survey Questions

Multiple choice:

1. What edition of the program were involved in?

Short answer:

2. How or where did you hear about the DigiGirlz program?

Yes or No responses:

3. Have you been a part of an IT project or a course prior to participating in DigiGirlz?

Scaled Questions (on a scale 1-5, 1 being strongly disagree and 5 being strongly agree):

4. I feel that there was enough attention given to me, individually, by mentors in the program.
5. The length of time of the DigiGirlz program felt like enough time to complete my project.
6. I would recommend DigiGirlz to a friend/peer.
7. I have a desire to continue learning about science and technology.
8. I feel that the DigiGirlz Mentorship Program has increased my knowledge in the fields of science, technology, engineering, and/or math (STEM).

Open Ended Questions:

9. What was the most impactful or memorable moment with DigiGirlz?
10. What would you change if you were in charge of DigiGirlz?
11. Is there anything else you want us to know about your experience in the DigiGirlz program?

Appendix D

D.1 - Interview Analysis using Open Coding Table

For Each DigiGirlz Administrative Interview:

Open Code	Properties	Verbatim examples found from interview responses
Main themes from each interview we do	Aspects of these main themes	Quotes to support these themes will be used in this column

For Each Mentor Interview:

Open Codes	Properties	Verbatim examples found from interview responses
Main themes from each interview we do	Aspects of these main themes	Quotes to support these themes will be used in this column

For Each Mentee Interview:

Open Codes	Properties	Verbatim examples found from interview responses
Main themes from each interview we do	Aspects of these main themes	Quotes to support these themes will be used in this column

D.2 - Survey Analysis using Open Coding Table

From All Mentor Survey Responses:

Open Codes	Properties	Verbatim examples found from survey responses
Main themes from each survey we receive	Aspects of these main themes	Quotes to support these themes will be used in this column

For All the Mentee Survey Responses:

Open Codes	Properties	Verbatim examples found from survey responses
Main themes from each survey we receive	Aspects of these main themes	Quotes to support these themes will be used in this column

Appendix E

E.1 Template for Researching Organizations

Key Factor/Criteria*	DigiGirlz	Organization Name 1	Organization Name 2	Organization Name 3
Type of Organization				
Network				
Purpose				
Location				
Expansion Strategies				
Challenges				

*Within each criteria were specific questions that directed our search, these are listed below:

Type of organization: Are they a non-governmental organization? Are they connected with the school system, high schools or universities? Are they a non-profit?

Network: Who started the organization and when; who now leads the organization? Who is the main point of contact for? How many people work with the organization? Is there potential for an introduction to more potential partners?

Purpose: The organization's purpose and mission. What is the organization's specialization?

Location: Is the organization located in a physical building or space? Where is this? What is the surrounding infrastructure? Are they located in a rural or urban area? What sort of access to transportation do they have?

Expansion Strategies: Strategies that were used within the organization in their growth and expansion process (if this occurred).

Challenges: Obstacles that the organization faced and how they struggled or overcame these. How has COVID-19 affected them in their 2020 programs?

E.2 Completed Table for Researching Organizations

	AWTAD	AWIS	SheCodes
Type of Organization	<p>Started in 2008, established mentorship programs in 2009 in Egypt. Geared more toward economic prosperity such as programs that are in the sphere of marketing, sales, business, entrepreneurship, etc. Training is a three day process and mentorship program is usually 2-3 months max.</p>	<p>Registered as a nonprofit in Algeria. Started in April 2020, started as a virtual organization. Focus on women in STEM.</p>	<p>Founded the program in 2018. Nonprofit organization. Focus on empowering women in the STEM field. Begin in the boot camps where they learn mobile apps (iOS/Android), graphic design, market research, economics, writing techniques. These are introductory. Has multiple series including the SheSeries and follow-up series: SheDesigns and SheDevelop.</p>

Network	<p>They have a small full-time staff of about 15 people. The others are volunteers. There is a director, oversees day-to-day duties and work. They have multiple programs usually running at same time so the staff splits up and takes on different programs.</p>	<p>The staff is all volunteers, about 30 people in total. There's around 15 mentors that are permanent, and 10 executive members in this staff that overlook everything. The organization works with programs that work with the US Embassy and mostly with start-up incubators.</p>	<p>The staff is employees and there are 10 of them. Each has their own tasks to do that includes marketing, operations, graphic design, project manager. Oldest is 35, youngest was 16 for the SheCodes programs. Alumni from the program become volunteers and they receive a lot of training; work with a lot of Embassies and the Embassies offer training. Libyans are on Facebook this is where they try to get students to sign up. Instagram is to build a connection between them and their participants introduce participants to make them feel proud in their work</p>
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Purpose	They work mainly with economic empowerment for women and youth. Three main pillars: job creation, entrepreneurship, and handi-crafts. They want to help university students target and narrow down their ideas. The coach for women to be able to enter the workforce on their own and sustain their business.	Want to connect Algerian girls with people around the world for mentoring. Organization was started because Algerian education system does not mentor and help women to continue past their schooling career. There is not enough promotion for women in STEM.	Wants women to get engaged in STEM; wants it to be accessible (women/mothers could even work from home). Make the STEM field to look more attractive to women; it's easy, fun, and empowering to build something from scratch. They want to change the culture entirely and realized they needed to start with kids ages 5-17 (eKids!)
Location	Egypt, Headquarters in Cairo, building with many rooms, used for meetings, programs, training, etc. Access to computers, internet, very tech savvy	No physical location. All virtual as of now. Hope to have a physical location in Algeria in the future.	In Benghazi, Libya. In a normal year, all of this would be in person. In the process of investing in their platform; want to develop online content for people to download that they can use in other cities.

<p>Expansion Strategies</p>	<p>Several funders, local programs with partners, partners who funded: US, IMP, Microsoft, Henkel, and more. Open to new partnerships! Need more people/partnerships with private sector companies to be buyers/create contracts for their participants. They want to expand but grow their impact, not their numbers necessarily.</p>	<p>They could help DigiGirlz by advertising the program, extending their contacts and going through the US Embassy too. They want to get legal status in Algeria, get more funding, grow in size (more mentees and mentors), want to work with local universities in Algeria, and set up a physical space. They would also like to implement scholarships and grants if they get good funding in the future.</p>	<p>Interested in a partner organization would need to have the same mission; at least one of the founders needs to have a technical background (is difficult to work with if they don't know about tech) → really not too concerned with those qualifications otherwise. Love to expand their program, don't care about ownership, love to provide their strategies and methods to other organizations.</p>
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<p>Challenges</p>	<p>Some women and youth do not have access to their online applications so the organization needs to find them and call them. Covid has made in-person events hard, they still try to have small gatherings with everyone distant. Their social media accounts are not taken care of, they do not use them to the best of their ability. Hired someone to work on getting those up and running.</p>		<p>Libya is undergoing war → electricity and internet is not reliable at all For Covid → they recorded these sessions; students came to the office to pick up a tape they could watch at home without having to download it. If they could get internet access at certain times, they would upload their assignments. If they couldn't, they would sanitize them and drop them off at the headquarters.</p>
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Appendix F

F.1 Completed Open Coding Tables for Mentors Surveys

Open Codes	Properties	Verbatim examples found from interview responses
Main themes from each interview we do	Aspects of these main themes	Quotes to support these themes will be used in this column
DigiGirlz is having an impact and is successfully working for it's goal	Mentors wanting to study IT/work in IT, Learning something from DG Program, Positive reactions	<p>“Helping girls to be more confident about joining the STEM field and be ready to step in such a challenging work field”</p> <p>“Girls in STEM is a cause that I care about so I wanted to join this community who brings on positive change.”</p> <p>“to encourage girls to go into the STEM field as it was a personal dream of mine”</p>
Heard about DigiGirlz from someone close	Mentors hearing about the program through a friend who may have gone through the program. Those friends may recommend the program to their peers	<p>“My friend told me about it”</p> <p>“My friend told me about it, and she was my teammate in the program”</p> <p>“Friend had participated in the previous version”</p>

<p>DigiGirlz helps build skills</p>	<p>Wanting to improve/build skills such as leadership, entrepreneurship, confident, teaching, problem- solving and mentoring</p>	<p>“standing out of my comfort zone and starting testing and developing both my personal and professional qualities.” "Another goal was to develop my leadership skills." "You learn more by sharing your knowledge to someone or helping him to learn." "entrepreneurship, project building, and mentoring of course". "also to get out of my zone of comfort" "develop my leadership, communication and teamwork skills"</p>
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<p>Connection between Mentors and Mentees</p>	<p>The mentors and mentees share a strong bond over the course of the program, making the experience memorable for the mentors.</p>	<p>"I think the training days as I met new people and participated in many workshops" "The first meeting with the mentees" "Talks and links I personally established with the mentees during the program and seeing their motivation and drive to give the best outcome." "sadness on mentees' faces because of their loss . And the positive thing is that they asked me right before" "Even if we were not meeting each other, we were doing a great work! We understand each other and we help each other and that was one of the memorable moments in DigiGirlz"</p>
<p>DigiGirlz is able to advertise their program but could bring it to next level</p>	<p>Many of the mentors found out about their program through facebook page, instagram, and association anoul, they could create website to get more mentors easily in case the mentors don't have social media.</p>	<p>"By the Facebook page of the association Anoual" "On Anoual's social media" "A facebook post" "Instagram"</p>

<p>Areas of improvement</p>	<p>Challenges that DigiGirlz faced and would like to see some improvements on</p>	<p>“Provide each team with a local where they can hold their meetings (through a partner in each city for example) and create a program of essential trainings that mentors must provide to their mentees” “It will also be likeable if there is a database like a website or an app where all the participants in the program from last year and this year can communicate and share experiences” “ I would have more people on my team check on the mentors teams and help them whenever needed”</p>
<p>Reactions towards the application process</p>	<p>The application process were difficult to fill out for some of the mentors while for some were straightforward</p>	<p>“It was a bit difficult to complete, it took time. But that's okay because not just anyone can become a mentor” x4 “it wasn't an easy to go form” “Non favorable” x 6 “For me it was very good because it was clear and the questions were simple and direct” “I think it was enough to have a sight on the willingness of the team and how much they are eligible and interested in the program.”</p>

F.2 Completed Open Coding Tables for Mentors Surveys

Open Code	Properties	Verbatim examples found from interview responses
DigiGirlz’s teaching program is making an impact	Positive answers about wanting to change nothing, feeling like they want to continue learning about STEM and IT, they would recommend the program to their peers	<p>“One of the highlights of my lockdown”</p> <p>“Learned a lot of technology and entrepreneurial techniques”</p> <p>“Helped me to look for and find solutions and love technology”</p> <p>“I feel that there was enough attention given to me, individually, by mentors in the program.</p> <p>5 x 13 responses”</p> <p>“I feel that the DigiGirlz mentorship program has increased my knowledge in the fields of science, technology, engineering, and math. (1-5)</p> <p>5 (highest rating) x 11 responses</p> <p>4(second highest) x 8 responses”</p> <p>“I would recommend DigiGirlz to a friend/peer. (1-5)”</p> <p>“5 x 20 responses</p> <p>4 x 3 responses”</p>

<p>DigiGirlz is able to advertise their program and now could bring it to next level</p>	<p>Successfully showcase the program through social media like facebook and instagram, and coming to school to talk about the program. They could think of creating a website for anyone to see incase they don't have social media or are not at school.</p>	<p>"I heard about the program from their Facebook page" "Facebook" " Heard from school" "From principle"</p>
<p>Areas DigiGirlz could improve upon</p>		<p>"More activities to better understand the training" "will make sure all high schools are in collaboration with DigiGirlz" "national competition/in the semi final where we had a technical problem the sound in our video wasn't clear" "sad that the national competition of 2020 edition was online , because i feel like i would have given more and shown more of what my team and i are capable of and maybe the results would have been different"</p>

Appendix G

G.1 Completed Open Coding Tables for Interviews with Souhail Stitou

Open Code	Properties	Verbatim examples found from interview responses
Main themes from each interview we do	Aspects of these main themes	Quotes to support these themes will be used in this column
Areas in DigiGirlz that are weak	There are some aspects of DigiGirlz that they want to see some improvements on. Areas they are finding challenging.	<p>“The technical training is weak sometimes. Lots of languages and tools it's hard to keep up with. For example, the tool that you use, or the languages that you use, the change, and the scripts are doing updates and everything. It's a little bit difficult for us since we are an organization more specialized in leadership. And this is why we decided to work with Microsoft, we were expecting that they would help with the technical parts. But unfortunately, we are doing everything on our own.”</p>
Expanding the program	Plans and ideas that DigiGirlz have in mind in expanding their program.	<p>“Thinking about partnering with mostly NGOs because it's directed by an NGO it would likely be the same in other countries.”</p> <p>“Thinking about expanding to universities since they can use the mentors as intermediaries and give them the responsibility.”</p> <p>With training they want to find individuals that can provide technical training.”</p> <p>“[DigiGirlz] does not need any more partners for funding; they feel covered by the support the US Embassy provides.”</p>

		<p>“Upcoming editions will maybe want big funds for expansion and they could make good use of funds”</p>
<p>Flexible in coordinating the program</p>	<p>The administration team works well with each other and is equally coordinated with one another on how to run the program successfully.</p>	<p>“Follow up coordinator position(making forms analyzing data making recs) Souhail and the program coordinator contact speakers and set up inspiring programs. There are also 3 or 4 part time helpers on the program.”</p> <p>“The tasks are always done on time. Sometimes they need tasks earlier than expected and in that case they find someone else to do it.”</p>
<p>Strongest areas</p>	<p>Areas in DigiGirlz that are working well for them</p>	<p>“Strongest areas: Entrepreneurship part and Inspiration part”</p>

Advertising their program	DigiGirlz is on many social media platforms to showcase their program	<p>“Two years ago they did a huge campaign of media releases that they were on most of the media they have in Morocco.”</p> <p>“[DigiGirlz] have also been on the radio.”</p> <p>“Souhail said microsoft made a website for DG in the first edition but then they stopped paying for the url.”</p> <p>“They are happy to have a DG section on the association Anoual website.”</p>
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G.2 Completed Open Coding Tables for Interviews with Ghizlane Akourim

Open Code	Properties	Verbatim examples found from interview responses
Main themes from each interview we do	Aspects of these main themes	Quotes to support these themes will be used in this column
Strong Desire to Expand	They want to reach more girls, they want to grow their impact, how they want to expand, why they want to expand	<p>“But even before I joined the program, I saw how the program kept growing and growing, and how every year they bring something new to the table, always reaching more people. And for me, that's like the most powerful thing, the bigger impact is that we got to reach high schoolers from like, very far places in Morocco that we couldn't reach ourselves.”</p>

<p>Their structure is small, interwoven, and constantly improving</p>	<p>They are always working to improve their programs, they do not have a huge leadership team but they all are passionate and work hard in many areas of DG, the team works together closely with each other but also with the participants to get better</p>	<p>“Everyone has specific tasks, but also has the flexibility to do anything else they want.”</p> <p>“They started small, but grew and grew and adapted, coming up with new things. The team doesn’t get tired and no one is bored, but they keep the same vision/vibes/empowerment.”</p>
<p>DG mentorship process is specific and unique</p>	<p>Their training process prepares the mentors not only in soft skills but technical skills as well, the mentors are trusted to choose their mentees, they want the mentors to choose because they know their local communities better -- this makes the projects more centered around the needs of the community</p>	<p>“It is nice if they have some kind of experience, but that is not as important They don’t need a lot of technical experience, that’s what the training is for”</p>
<p>Challenges they faced and improvements they could make</p>	<p>Due to the pandemic, there was lots of motivation loss and it was hard to connect with the participants.</p>	<p>“Currently they only use social media.”</p> <p>“[Interviewee One] Thinks they are doing a lot of great work, but are not effective at communication.”</p> <p>“When the [in-person training program] was taken away because of covid, a lot of motivation was lost (everyone is really excited about this program).”</p>

G.3 Completed Open Coding Tables for Interviews with Chaimae Idrissi

Open Code	Properties	Verbatim examples found from interview responses
Main themes from each interview we do	Aspects of these main themes	Quotes to support these themes will be used in this column
Shares a strong message with the community	Speaking engagements and social media posts doesn't not only recruit the participants but also brings the gender gap to the attention of whoever is engaged.	"When they see a project like DigiGirlz, they see that kind of flight, that brings some lights to how they can have more girls in the field and that they are going to see a bridge between the number between the girls in STEM and the boys in STEM."
Running the DigiGirlz more smoothly	Keeping the program more organized through multiple tasks by each team member where they take the responsibility in making everything leading up to the program goal is going well	"Managed to have a list of tasks and each one of the team members had their own task. After each finished their task, they then have a meeting to discuss". "Coordinated with the speakers and also with the girls, so if they have some issues with the deliverables or similar to that, she meets with them in a meeting to explain to them what they needed to do."
DigiGirlz looking to expand	Looking for partnership with organizations that are STEM/IT based and universities that have clubs like DigiGirlz	"[Interviewee Two] thinks it would be a good opportunity if they had more partnerships with organizations that work with STEM and an organization that invites girls to work in the STEM field and tells girls in the organization program their stories."

<p>DigiGirlz helps to build soft skills and not only technical skills</p>	<p>Skills like leadership, working in groups, problem solving, and decision making</p>	<p>“There is some session in the training about how to be a good leader; How to be a good team leader estimator; How to work in groups; How to solve some issues.” “Learning and improving things like other good skills, like being in groups and like public speaking and like all of those good things.”</p>
<p>DigiGirlz has done well with word of mouth advertisement, but can increase online presence</p>	<p>Increasing the program's presence online (own websites, social media, university clubs) will help them to reach more people as they have already done a great job advertising on a national level.</p>	<p>“They go to the university where they explain to the girls what DigiGirlz is, why we are doing this, why it's important to be part of the program, all stuff that is related to DigiGirlz” “The Association Anoul has a website but DigiGirlz does not have a website.”</p>
<p>Big age group for the mentors that are chosen</p>	<p>The mentors that are chosen could be very well, providing a wider range of skills to the mentees</p>	<p>“Between 18 years old to 45 or so; Pretty big range; Have some mentors that were in their last year attending their universities.”</p>
<p>Less connection between DigiGirlz Team and Mentees</p>	<p>DigiGirlz administrative team has more connections and time to work with the mentors, but struggle to really get to know the mentees</p>	<p>“We need the team to have more connections with the mentees. If something goes wrong, they don't usually speak up and they (DigiGirlz team) will miss out on the issue that has come up.” “[Interviewee Two] had good connections with some mentees.”</p>

<p>Matching Mentors with Mentees</p>	<p>Setting up the groups between Mentors and Mentees varies which sometimes lead to difficulty but in a good way.</p>	<p>“The last edition, they have a group of mentors and two groups of mentees. For example: They had a group of mentors with 5 girls and they had two groups of mentees with a group of 5, 4, 6 something.”</p> <p>“It depends on the situation on the matches. But they have some difficulty working together. Sometimes it is a good thing to have some difficulty in, in this because it gives them the opportunity to overcome those issues and work their way through.”</p>
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G.4 Completed Open Coding Tables for Interviews with Interviewee One

Open Code	Properties	Verbatim examples found from interview responses
<p>Main themes from each interview we do</p>	<p>Aspects of these main themes</p>	<p>Quotes to support these themes will be used in this column</p>

<p>Importance of helping women and girls in STEM/IT, why programs like DG is important too</p>	<p>DigiGirlz brings up the gender gap to the attention and want to increase their impact to bring more girls in the field of STEM/IT</p>	<p>“IT fields are dominated by men, have to prove to them that girls can be in the IT field” “Girls in North Africa, they need to know their potential, they need to know that engineering or computer science is not only for male”. We have to do something about it.” “According to UNESCO, there are high rates of engineers who are girls. But the problem is that when girls get that degree and then they get married, it's over, because when a married woman applies to be an engineer they'll be asking questions like when you will give birth to babies.”</p>
<p>Developing skills</p>	<p>DigiGirlz help build skills that aren't taught to the mentors in universities (group work, technical skills, business, social skills)</p>	<p>“I really liked the concept of the workshop and how it brings in all sorts of engineering, computer science, technology, and IT-related stuff.” “Introduce to the world of business that was really interesting.” “I learned to work hard and study hard because universities do not teach all of those skills to us.”</p>

Workload is heavy	There are a lot of tasks and work to do for the mentors.	“I was overwhelmed by the huge workload. The transition from face to face (in person) to online. Needed to deal with the workload.”
Finding the right job requires a lot	Need more than a degree to get a job, need the experience and skills. Possible Recommendation for DigiGirlz, to keep in mind.	“Says that having a bachelor in Computer science is not enough, maybe thinking of doing an MBA” “Getting a job is important, as a startup, can get the experience of watching how a CEO works, what it is like to work for others.”
Challenges of the program	Possible recommendations for DigiGirlz, things to keep in mind when analyzing the success of the program	“Finding it hard to understand software stuff like UML, where they talk about Object-Oriented programming because the mentees don’t know about those things. Prototyping tools, hard for the mentees to learn at the beginning”
Brought in more connection	DigiGirlz’s group chat helped mentors gained more opportunities	“Stayed in contact with DigiGirlz Through Whatsapp where she would be updated on news like Hackathon, other opportunities about artificial intelligence, eye-opening opportunities. Learn more about opportunities

		Networking and connections”
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G.5 Completed Open Coding Tables for Interviews with Interviewee Two

Open Code	Properties	Verbatim examples found from interview responses
Main themes from each interview we do	Aspects of these main themes	Quotes to support these themes will be used in this column

<p>Importance of helping women and girls in STEM/IT, why programs like DG is important too</p>	<p>DigiGirlz brings up the gender gap to the attention and want to increase their impact to bring more girls in the field of STEM/IT</p>	<p>“IT fields are dominated by men, have to prove to them that girls can be in the IT field” “Girls in North Africa, they need to know their potential, they need to know that engineering or computer science is not only for male. We have to do something about it.” “According to UNESCO, there are high rates of engineers who are girls. But the problem is that when girls get that degree and then they get married, it's over, because when a married woman applies to be an engineer they'll be asking questions like when you will give birth to babies.”</p>
<p>Developing skills</p>	<p>DigiGirlz help build skills that are not taught to the mentors in universities (group work, technical skills, business, social skills)</p>	<p>“I really liked the concept of the workshop and how it brings in all sorts of engineering, computer science, technology, and IT-related stuff.” “Introduce to the world of business that was really interesting.” “I learned to work hard and study hard because universities do not teach all of those skills to us.”</p>

Workload is heavy	There are a lot of tasks and work to do for the mentors.	“I was overwhelmed by the huge workload. The transition from face to face (in person) to online. Needed to deal with the workload.”
Finding the right job requires a lot	Need more than a degree to get a job, need the experience and skills. Possible Recommendation for DigiGirlz, to keep in mind.	“Says that having a bachelor in Computer science is not enough, [I’m] maybe thinking of doing an MBA.” “Getting a job is important, as a startup, can get the experience of watching how a CEO works, what it is like to work for others.”
Challenges of the program	Possible recommendations for DigiGirlz, things to keep in mind when analyzing the success of the program	“Finding it hard to understand software stuff like UML, where they talk about Object-Oriented programming because the mentees don’t know about those things. Prototyping tools, hard for the mentees to learn at the beginning”
Brought in more connection	DigiGirlz’s group chat helped mentors gained more opportunities	“Stayed in contact with DigiGirlz Through Whatsapp where she would be updated on news like Hackathon, or other opportunities about artificial intelligence, eye-opening opportunities.” “[I] learned more about opportunities and networking and connections.”

G.6 Completed Open Coding Tables for Interviews with Interviewee Three

Open Code	Properties	Verbatim examples found from interview responses
Main themes from each interview we do	Aspects of these main themes	Quotes to support these themes will be used in this column
Brand placement on social media platforms was strong	The use of Facebook and Instagram has been successful for DG when reaching out to potential beneficiaries. DigiGirlz use of WhatsApp was good.	<p>“Found it on the Morocco embassy page on Facebook even up to last year.”</p> <p>“Facebook of the US embassy and Instagram have a lot of sources.”</p> <p>“It was easy to get in contact with Souhail and it was nice to have a single point of contact through WhatsApp or email.</p>
Program improvements	The ToT needs to be extended to teach more technical skills like coding and web design. Help over a longer period of time with the shorter sessions so that more information can be retained.	“The ToT needs to change to offer more substance, and focus more on teaching women IT”
Staying connected after the program	The DG creates bonds that go beyond the conclusion of the program and fosters curiosity.	“[I am] still working with her mentees on projects they are creating outside of DG.”
DigiGirlz provides a lot of learning and new experiences for the participants, these are popular and enjoyable	DG provides many new experiences for its participants.	<p>“The leadership components were interesting and helpful.”</p> <p>“It was a transformative experience for her and she learned concepts at a young age that she is grateful for and helping the community.”</p> <p>“They had leadership workshops where they met influencers and learned to use</p>

		social media with a purpose.” “[Association Anoual] has an advantage when it comes to soft skills and entrepreneurship workshops.”
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G.7 Completed Open Coding Tables for Interview with Professor Hall-Phillips (WPI)

Open Codes	Properties	Verbatim examples found from interview responses
Main themes from each interview we do	Aspects of these main themes	Quotes to support these themes will be used in this column
We need to understand the market that we want to help DigiGirlz expand into. Know the area	Learning about the culture of the region, understanding the infrastructure, and their capabilities for partnering.	<p>“It is VERY IMPORTANT if the delivery of the program in Morocco can be delivered in the same way in another country or location.”</p> <p>“See if we can find things about using the internet, day-to-day life, and whether or not that area is conducive to DG as a community program.”</p> <p>“Try to figure out what they are delivering and how it fits into the new culture and how their work will look differently in new locations. Social aspects, cultural aspects, women, religion. Could be polarizing issues that DG plays in other locations.”</p>

<p>Use multiple platforms when reaching out. Do not hesitate to double message.</p>	<p>If you care about getting responses you need to be persistent. Keep your story the same but find multiple sources you can reach out through.</p>	<p>“Try reaching out through both Facebook and Email. Maybe even three, we could use instagram and twitter too. We will get more responses by doubling up on our outreach platforms.” “Contact Us links on websites → those emails are more monitored.” “Don't be scared that we're messaging them. Send them multiple messages! Don't be hesitant.”</p>
<p>Advertise DigiGirlz and show your passion for them so that the potential partners understand you are serious about helping them</p>	<p>We are more likely to receive better responses and feedback when we share with the organizations about how great we think DigiGirlz is. This will make them more likely to be interested in partnering</p>	<p>“We need to come up with WHY we think DG would be great for one of these areas.” “Vouch for DigiGirlz.” “We are pretty much working a sales job for DigiGirlz. We want to advertise them well to our potential partners.”</p>

G.8 Completed Open Coding Tables for Interview with Professor Ching (WPI)

Open Codes	Properties	Verbatim examples found from interview responses
<p>The definition of “expansion” varies heavily</p>	<p>NGO expansion looks different from corporate finance expansion. Can be multifaceted. Can expand based on geography, areas of interest, etc.</p>	<p>Expansion is defined by the domains; is it geographic, is it areas of interest, etc. (can be very multifaceted) → expansion is always in reference to something (in terms of reaching more people, geography, depends on what your goal is)</p> <ul style="list-style-type: none"> - look for geographies similar to Morocco (similar markets and audiences with needs)

		<ul style="list-style-type: none"> - International expansion: other areas have similar needs, how do we get there → internalization
Strategies for expansion will be different for NGOs vs. for-profit companies	<p>Corporate companies have much more funding and resources behind them as they look to expand.</p> <p>Different goals in expanding a for profit business vs. an NGO.</p>	<ul style="list-style-type: none"> - if you talk to corporate finance people, one strategy would be leverage (this is what I want to grow into, but I don't have the resources → borrow money)
Strategies always include tradeoff	<p>When looking to expand, we will have to think about what we're/DigiGirlz is willing to compromise.</p> <p>Will have to tradeoff with other companies depending on what they want/their goals are.</p>	<ul style="list-style-type: none"> - Think of strategy as: a set of plans/actions that involve tradeoff - If it doesn't involve a tradeoff, it's not a strategy - "There is no free lunch"
Ensure our definitions of certain terms are well set	<p>It will be very difficult to expand if we don't know what that looks like (<i>how we want to expand, where, what that means, etc.</i>).</p> <p>Define what "success" will look like to us.</p>	<ul style="list-style-type: none"> - Have a clearly defined set of metrics in terms of what is success, and what are we measuring ourselves against compared to other companies - Ambiguity is really tough to work with
COVID has allowed expansion to be thought of in different ways since we've learned to do so much virtually	<p>The transition to so much of the work being done in the world virtually can actually help us here → we can think about if it's possible to expand to new countries without actually needing to send people across borders.</p> <p>Working virtually makes communication faster, easier,</p>	<ul style="list-style-type: none"> - thinking about expansion has taken a radical shift; a lot of research going on now about what this really means in a world where so much can be done virtually - in a world where so much can be done virtually - There are few good reasons why we need to be face to face with people

	<p>and more multifaceted. We can get in contact with so many people we weren't previously able to. The Internet is becoming more widely available across the world → this connects a whole new audience of people that we wouldn't otherwise reach.</p>	<ul style="list-style-type: none"> - Maybe all we need is to find a local partner, and don't need to put physical people on the ground in a new location - This pandemic has provided a lot of new ideas for doing things remotely
<p>Effective communication is crucial</p>	<p>Reaching out through social media will be a great asset → easier communication. Don't feel bad reaching out in any way you can or have access too.</p>	<ul style="list-style-type: none"> - Effective outreach is important for us → keep hammering away at this; maybe call people too - asks if these organizations have social media (yes almost all of them do) - Optimistic since it's easier to get connections that way - LinkedIn Pages → look for people in those organizations through LinkedIn (reach out to them that way)

G.9 Completed Open Coding Tables for Interview with Professor Lombardi (WPI)

Open Code	Properties	Verbatim examples found from interview responses
Main themes from each interview we do	Aspects of these main themes	Quotes to support these themes will be used in this column

Successful expansion strategies that businesses and organizations use when growing	Ways to build a strong relationship when partnering up with other organizations	“One of the main elements, connectivity. Getting to know a lot of people who are willing to work with you and not wasting time, committed.” “Professor experience: Seen people wasting a lot of time not doing what they were supposed to do. Understood how to find opportunity, person, contact will lead you to where you want to be v.s those that are not considerate”
Factors to look into when we reach out to international organizations	In reaching out to international organizations, how should we initiate contact with these potential partners	“Learn beforehand if those people from the organization communicate with kids (not just teachers). Contact IT people or others like (law firms, accounting firms, hospitals). Who they know would be interesting in mentoring”
Access to education in Morocco varies between urban, rural, and city	The education availability in Morocco is important to take into consideration when thinking of expanding	“How available is the education there in Morocco? take into consideration. It is important to take into consideration: How many girls are there out there? Knowing Where are the girls are from is important. Girls from cities are different from country girls (for example America) girls in the city are more flexible”

G.10 Algerian Women in Science Interview

Key Factor	Phrases and Words Related to Factor
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Type of Organization/Structure	Registered as a nonprofit in Algeria. Started in April 2020, started as a virtual organization. Focus on women in STEM.
Network	The staff is all volunteers, about 30 people in total. There's around 15 mentors that are permanent, and 10 executive members in this staff that overlook everything. The organization works with programs that work with the US Embassy and mostly with start-up incubators.
Purpose	Want to connect Algerian girls with people around the world for mentoring. Organization was started because Algerian education system does not mentor and help women to continue past their schooling career. There is not enough promotion for women in STEM.
Location	No physical location. All virtual as of now. Hope to have a physical location in Algeria in the future.
Expansion Strategies	They could help DigiGirlz by advertising the program, extending their contacts and going through the US Embassy too. They want to get legal status in Algeria, get more funding, grow in size (more mentees and mentors), want to work with local universities in Algeria, and set up a physical space. They would also like to implement scholarships and grants if they get good funding in the future.
Challenges	They are a small and new organization so it is challenging to take on many tasks at once. (Kinda a challenge) Not very active on facebook, not professional enough. They do not have complete legal status so are restricted to who they work with (no minors) and cannot receive funding yet in Algeria.

G.11 Association for Women's Total Advancement and Development Interview

Key Factors	Phrases and Words Related to Factor
Type of Organization	Started in 2008, established mentorship programs in 2009 in Egypt. Geared more toward economic prosperity such as programs that are in the sphere of marketing, sales, business, entrepreneurship, etc. Training is a three day process and mentorship program is usually 2-3 months max.

Network	They have a small full-time staff of about 15 people. The others are volunteers. There is a director, oversees day-to-day duties and work. They have multiple programs usually running at same time so the staff splits up and takes on different programs.
Purpose	They work mainly with economic empowerment for women and youth. Three main pillars: job creation, entrepreneurship, and handi-crafts. They want to help university students target and narrow down their ideas. The coach for women to be able to enter the workforce on their own and sustain their business.
Location	Egypt, Headquarters in Cairo, building with many rooms, used for meetings, programs, training, etc. Access to computers, internet, very tech savvy
Expansion Strategies	Several funders, local programs with partners, partners who funded: US, IMP, Microsoft, Henkel, and more. Open to new partnerships! Need more people/partnerships with private sector companies to be buyers/create contracts for their participants. They want to expand but grow their impact, not their numbers necessarily.
Challenges	Some women and youth do not have access to their online applications so the organization needs to find them and call them. Covid has made in-person events hard, they still try to have small gatherings with everyone distant. Their social media accounts are not taken care of, they do not use them to the best of their ability. Hired someone to work on getting those up and running.

G.12 SheCodes Interview

Key Factors	Phrases and Words Related to Factors
Type of Organization	Founded the program in 2018. Nonprofit organization. Focus on empowering women in the STEM field. Begin in the boot camps where they learn mobile apps (iOS/Android), graphic design, market research, economics, writing techniques. These are introductory. Has multiple series including the SheSeries and follow-up series: SheDesigns and SheDevelop.
Network	The staff is employees and there are 10 of them. Each has their own tasks to do that includes marketing, operations, graphic design, project manager. Oldest is 35, youngest was 16 for the SheCodes programs. Alumni

	<p>from the program become volunteers and they receive a lot of training; work with a lot of Embassies and the Embassies offer training. Libyans are on Facebook this is where they try to get students to sign up. Instagram is to build a connection between them and their participants introduce participants to make them feel proud in their work</p>
Purpose	<p>Wants women to get engaged in STEM; wants it to be accessible (women/mothers could even work from home). Make the STEM field to look more attractive to women; it's easy, fun, and empowering to build something from scratch. They want to change the culture entirely and realized they needed to start with kids ages 5-17 (eKids!)</p>
Location	<p>In Benghazi, Libya. In a normal year, all of this would be in person. In the process of investing in their platform; want to develop online content for people to download that they can use in other cities.</p>
Expansion Strategies	<p>Interested in a partner organization would need to have the same mission; at least one of the founders needs to have a technical background (is difficult to work with if they don't know about tech) → really not too concerned with those qualifications otherwise. Love to expand their program, don't care about ownership, love to provide their strategies and methods to other organizations</p>
Challenges	<p>Libya is undergoing war → electricity and internet is not reliable at all For Covid → they recorded these sessions; students came to the office to pick up a tape they could watch at home without having to download it. If they could get internet access at certain times, they would upload their assignments. If they couldn't, they would sanitize them and drop them off at the headquarters.</p>

Appendix H

H.1 Outreach to Potential Partner Organizations - Email Template

(This template is the one used by our team of WPI students to reach out to potential partner organizations)

Dear [ORGANIZATION NAME],

We hope you are staying safe and have been well amidst these unprecedented times.

We are a group of American students from Worcester Polytechnic Institute, an engineering school in the greater Boston, Massachusetts area.

Our team is working with DigiGirlz Morocco, and Association Anoual Vice President Souhail Stitou. DigiGirlz Morocco is a mentorship program that provides guidance and education to young women interested in IT fields.

They have had hundreds of applicants yearly, beginning with their first edition in 2017. They have been progressively expanding their network across Morocco in past years, and are now looking to grow internationally across the MENA region. This is what our team of researchers has been assisting the program with for the past few months.

We have been researching organizations to potentially partner with DigiGirlz Morocco in their plans for expansion, and we think your organization would be a fantastic fit. We are reaching out to your organization to see if you would be willing to sit down in a virtual interview and answer some questions we have regarding the work your organization does.

Is there anyone in your organization we would be able to set up a time to meet with for the week of March 1, 2021 or the week of March 8, 2021? We are on Eastern Time but can accommodate any time zone.

We greatly appreciate your time and help in this matter.

Sincerely,

DigiGirlz Morocco Research Team

Leshka Jankowski, Gabriel Kafka-Gibbons, Tyreese James, Cyra Katoch, and Hannah Hirsch

Group Email Alias: gr-DigiGirlzC21@wpi.edu

More information about DigiGirlz Morocco

<https://www.facebook.com/DigiGirlz.ma>

H.2 Outreach to Potential Partner Organizations - Social Media Direct Message Template

(This template is the one used by our team of WPI students to reach out to potential partner organizations)

Hi [ORGANIZATION NAME],

I hope you are staying safe and have been well amidst these unprecedented times. I am part of a group of American students from Worcester Polytechnic Institute, an engineering school in the greater Boston, Massachusetts area.

My team and I are working with DigiGirlz Morocco, an organization that is a part of the NGO Association Anoual. DigiGirlz Morocco is a mentorship program that provides guidance and education to young women interested in IT fields.

Our group has been assisting the DigiGirlz Mentorship Program in Morocco to find organizations in the North Africa region for them to create potential partnerships with. These partnerships are part of a larger plan to help DigiGirlz internationally expand as an organization. We have been researching and we think your organization would be a fantastic fit. We are reaching out to your organization to see if you would be willing to sit down in a virtual interview and answer some questions we have regarding the work your organization does.

Is there anyone in your organization who would be able to set up a time to meet with my group and I for the week of March 1, 2021 or the week of March 8, 2021? We are on Eastern Time but can accommodate any time zone.

I greatly appreciate your time and help in this matter.
Sincerely,
[YOUR NAME HERE] from the DigiGirlz Morocco Research Team

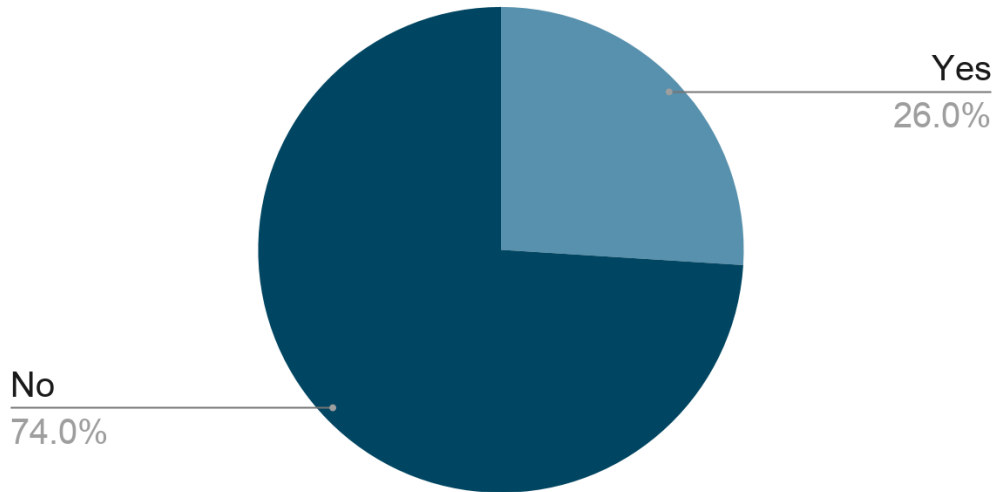
Group Email Alias: gr-DigiGirlzC21@wpi.edu

More information about DigiGirlz Morocco
<https://www.facebook.com/DigiGirlz.ma>

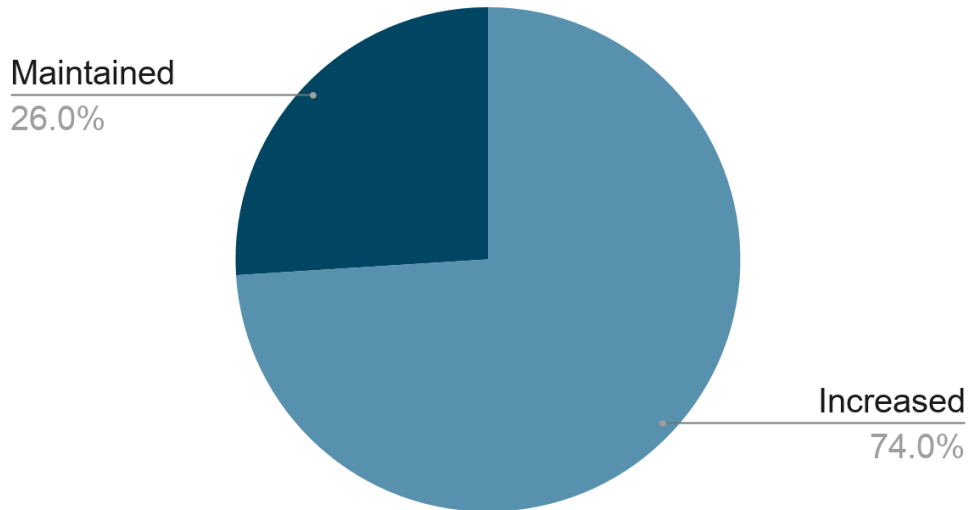
Appendix I

Statistical Data Collected Through Mentee Survey Responses

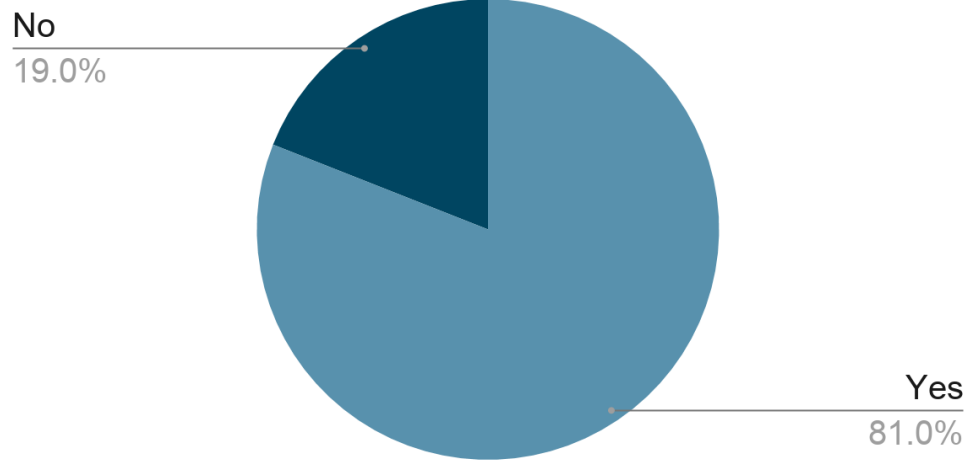
Percentage of Mentees That Described This Competition as Being the Most Impactful or Memorable Moment in the Program



Mentees Information Technology Knowledge Due to DigiGirlz



Participants Felt There Was Enough Individual Attention Given to Them From Their Mentors



Appendix J

J.1 Screenshot of Expansion Strategies list on page four from deliverable

Expansion Strategies

What do we mean by **"Expansion Strategies"**

Definition by WPI DigiGirlz Researcher Team:
"Step by step process by an organization who's mission is to achieve a higher growth than its past achievements" (Business Jargon, 2016) *

Here is a step- by- step list of strategies that DG can use to help them expand their program into North Africa.

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Learn about each strategy by clicking on each of the notes

*Research done by the WPI DG Research Team included the resources they gained from interviews and exploring through databases in WPI's Foisie Business School led them to build a definition of Expansion Strategy.

- STRATEGY 1**: Complete Thorough Market Research in Countries/Areas of Interest
- STRATEGY 2**: Identify and Reach out to Potential Partner Organizations
- STRATEGY 3**: Develop Legal Status in New Countries
- STRATEGY 4**: Define Complementary Roles and Responsibilities
- STRATEGY 5**: Focus on Shared Impact from Both Organizations

J.2 Screenshot of other organizations DMMP should reach out to on pages 18-20 from deliverable

Alternate Potential Partner Organizations Part 1

TECHNOVATION TUNISIA



Location: Tunisia
Mission: "We are a global tech education non-profit that empowers girls and families to become leaders, creators and problem-solvers."
Website: <https://technovationchallenge.org/>

DJANGOGIRLS



Location: Tunisia
Mission: "Djanjo Girls is a non-profit organization and a community that empowers and helps women to organize free, one-day programming workshops by providing tools, resources and support"
Website: <https://djangogirls.org/tunis/>

YOUNG TUNISIAN CODERS ACADEMY



Location: Tunisia
Mission: "YTCA is a social enterprise with a characteristic of an association. It cares about teaching programming, ICT and robotics sciences to kids between 5 and 16 year-old."
Website: <https://www.facebook.com/YTCAcademyTunisia/>

WOMEN LEADERS IN TECHNOLOGY



Location: Tunisia
Mission: "Empowering women working in STEM fields and helping them achieve their goals."
Website: https://www.facebook.com/woltechpublic/about/?ref-page_internal

Alternate Potential Partner Organizations Part 2

WOMEN WHO CODE



Location: Algeria
Mission: "Global non-profit dedicated to inspiring women to excel in technology careers."
Website: <https://www.womenwhocode.com/about>

SISTER-HOOD



Location: Tunisia
Mission: "Sister-hood is an award-winning digital magazine spotlighting the diverse voices of women of Muslim heritage."
Website: <https://sister-hood.com/tamadur-almah-di/shecodes/>

CODING GIRLS



Location: Internationally (All over the world)
Mission: "Coding Girls is a thought-leading movement on a mission to empower girls to change the world through technology and to inspire them to become innovators."
Website: <https://www.coding-girls.com/>

GIRLS IN TECH



Location: Internationally (All over the world)
Mission: "Girls in Tech works to erase the gender gap in tech. We offer education and experiences to help people discover their unique superpower and hone it."
Website: <https://girlsintech.org>

Alternate Potential Partner Organizations Part 3

WOMEN IN TECH AFRICA

Location: Across Africa

Mission: "Women in Tech Africa is a community of women/girls in technology roles across Africa, sharing knowledge and breaking the glass ceiling."

Website: <http://www.womenintechafrika.com/?fbclid=I-wAR2gYMV6jTvdvpeHqGlsIV5L4evkmfyYmbjWQXogk-WtB8yj18yaXjt3szc>



APPS AFRICA

Location: Across Africa

Mission: "Make our clients lives easier by providing a suite of services and capabilities to launch, expand and execute mobile and technology projects across Sub-Saharan Africa. Our team of experienced advisors possess the capabilities and wide network in the African tech ecosystem to benefit our clients goals."

Website: <https://www.appsafrica.com/appsafrica-advisory/>

