

RESILIENCE ACADEMY STUDENT INTERNSHIP MODEL AS AN INNOVATIVE WAY TO ENHANCE GEOSPATIALLY LITERATE FUTURE WORK FORCE IN AFRICA

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ABSTRACT:

This paper is based on the experiences from Resilience Academy project in Dar es Salaam, Tanzania, where students' are engaged to a mass-internships for a period of 8-12 weeks. Student internship model of the Resilience Academy is designed to work with the local organisations to conduct geospatial data collection campaigns based on the use of various open-source data and tools combined with community mapping and digital online working. Simultaneously, students' exposure to practical training during the internship provides them with relevant applied geospatial skills, which increase their future employment opportunities and participation in informed decision-making.

KEYWORDS: Geospatial skills, internships, industrial training, digital tools, open data services, resilient cities, global south, Tanzania

1. Introductions:

Urbanisation challenges Africa's young labour force, which needs to be skilled to solve problems caused by unplanned urbanisation. Looking to many African cities, urbanisation challenges is increasing over the past years that leads to increased urban disasters among other challenges such as Flooding (Bapari, Haque et al. 2016). Due to increase of these challenges, local skills for solving these challenges is needed in order to be able to finding solution during at the rise of these challenges.

Provision of skills to young university students is currently based on the basic university curriculum training that is not necessarily looking on the current urban challenges. Hence there is no long-term sustainability to using the local skills to finding urban solutions. Young, graduated experts need to be able to steer urbanisation to sustainable trajectories with digital skills of geospatial data and technologies, which enable urban transformation. Therefore, this is a major opportunity for African universities and their students' future employment.

2. Methods

In order to understanding and addressing this challenge, Resilience Academy¹ (RA) project designed to work with the local organisations to conduct geospatial data collection campaigns based on the use of various open-source data and tools combined with community mapping

and digital online working. Simultaneously, students' exposure to practical training during the internship provides them with relevant applied geospatial skills (Iliffe 2015), which increase their future employment opportunities and participation in informed decision-making.

The Resilience Academy is a university partnership program in Tanzania, focusing on geospatial skills and knowledge transfer for improved urban resilience. Resilience Academy uses tools and technologies, which are open, affordable and locally adaptable, such as drone images, smartphones and open-source software. New geospatial data and knowledge is created through community mapping methods aiming for improved spatial planning and risk management.

The advancement of online training is done in the digicampus² platform in form of MOOCs that have been developed with practical and real case training materials that answer urban challenges. The platform is therefore used by the students and university staffs during the industrial training to acquired necessary skills that are used during the industrial training program and also during normal university classes (Iliffe 2015). The training is given to university students during the first weeks of industrial training followed by the field works then finalise with data cleaning and data sharing in the last weeks of the program as it shows in the **table 1** below.

¹ <https://resilienceacademy.ac.tz/>

² <https://digicampus.fi/course/index.php?categoryid=62>

| Week | Activity | Number of days | Responsible |
|------------|--|----------------------|----------------------------------|
| Week 1 – 2 | Metadata, data quality, data management and data sharing | Between 3 – 5 days | Resilience Academy Team |
| Week 1 | Trainings that focus on the specific tasks/project | Between 4 – 5 days | Host |
| Week 5 – 7 | Fieldwork for data collections | Between 25 – 30 days | Host |
| Week 8 | Finalization and wrapping the industrial training activities | Between 3 – 5 days | 1. Host 2. Resilience Academy |

Table 1: Approximate time from which each activity takes during the industrial training

Generally, the courses developed under the resilience academy project are organised under four key themes: 1) Open data for resilience (3 courses), 2) Flood resilience in a changing climate (2 courses), 3) Community mapping for improved resilience planning (2 courses) and 4) Earth Observation for Resilience (1 course). The courses are also broken into sub-courses, where the idea generally is that learning is cumulating from the concepts to practical skills and then more applied skills, where students are working on their own data or apply their skills in the field, for example (Figure 1).

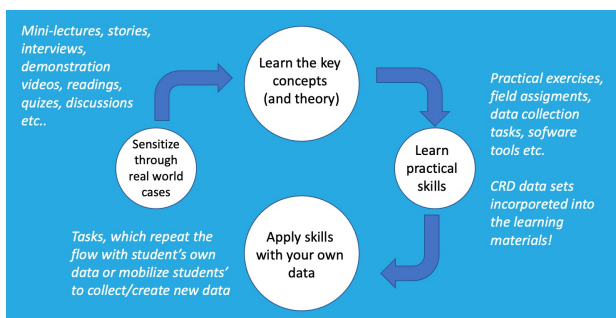


Figure 1. Learning flow of the Resilience Academy online learning courses.

3. Result

During the period of students placement program, new dataset is collected to answers urban challenges while other dataset are being updated due to the rapid urbanisations. This process enlighten more to university students about the importance of data updating. During the time of data collection and updating, involvement of the local community is a key to acquiring the local knowledge in order that the collected information has contributions from the local communities, hence the community are working together with university students

through the process of data collection by providing community information to the data being collected. Apart from that, government officials is the key contribution to the success of the actual data collection as it provides administration approval from the municipality level to the ward level where the data to be collected.

Since the project has started in 2019, more than 500 students have attended the training during the industrial training and benefited with the online training and practical experiences during the industrial training. Furthermore, more than 50 university experts have benefited with the training that resilience academy provides with Training of the trainer's program.

The industrial training program has resulted in collecting more than 130 dataset during the internship program and the data are ensured to be in good quality. This is attained through the training given to students by the university experts and local organisation during the internship period to work on the data cleaning and quality check before its shared in order that good quality data can be produced for academic and decision making.

The Resilience Academy promote the use of data through other activities one of them being ensuring free access of the data that is produced during the internship period to the university students, university experts and the government to conduct data analysis, data visualisation, research and for decision making. For example, each year since 2019, more that 200 university students from different discipline participates into the visualisation challenge that is aimed to equip students with visualisation skills to answer urban challenges. Therefore, the data collected during the placement periods are of use to finding urban solutions through visualisation challenge to clients.



Figure 2. Student during video recording for final pitching in 2020

It's through the placement program that different clients have managed to collect geospatial dataset using university students and community participation for only

8 to 12 weeks for example only in 2020, more than six cases have been developed from different clients during the placement period to collect more than 5000 data in Nungwi, Zanzibar, over 4000 data in Morogoro city and over 9000 data were collected in the city of Dar es Salaam.

4. Acknowledgements

This project would have not been successful without university partners: Ardhi University, university of Dar es Salaam, State University of Zanzibar, and Sokoine University of Agriculture which coordinate day to day activities of the resilience academy most specifically the industrial training program. Also work together to provide training to university staff and World Bank who provided the funding for the Resilience Academy project, OpenStreetMap Development Tanzania (OMDTZ) who have done all the trainings to students and other coordination and most of all the community members, who did most of the data collection. Special thanks go to the Government of Tanzania for their continuous support, and Commission of Science and Technology who has shown interest by requesting this mapping to run all over the whole city. They have also allowed us to show that simple and open source tools can collect massive information in short period of time not talking about the power of participation. Without them, we would not have been able to complete the mappings as of now.

Conclusion

The training is organised and conducted to university students during the industrial training. However, other trainings are given to the key university staff on training in order to provide skills to local experts and students that will give the needed skills and practicals to overcome urban climate and resilience challenges. Apart from training, Resilience Academy is working on a university Internship Program³, Climate Risk Database⁴ and Research and Innovation Activities.

5. References:

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³ <https://resilienceacademy.ac.tz/student-interns/>

⁴ <https://geonode.resilienceacademy.ac.tz/>