



Developing a Toolkit for Physical Education Teachers in Tanzania

Final report 12.04.2019

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21E12002 - CAPSTONE in Creative Sustainability
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Project team

Märt Vesinurm
Roosa Laurikainen
Surabhi Nadig
Veronica Peserico
Otto Schultz

UDSM Project team

Joshua Mshana
Lilian Baitu
Gabriel Mchaki
Joyce Thomas
Aikale Jakobo
Denis Prosper Chilla

Client

LiiKe Sports & Development

Pictures used in the report

Roope Kiviranta & Surabhi Nadig

Design

Märt Vesinurm



PBL EAST
AFRICA

A'' Aalto-yliopisto

Abstract

When our work began with our client LiiKe in January 2019, we were given the challenge to empower female PE (Physical Education) teachers in Tanzania by developing a digital solution to strengthen their community through interaction and sharing of knowledge.

Once we were in Tanzania, we obtained first hand information on these issues through interviews, workshops and field visits which revealed major problems faced by PE teachers and PE students. Among them were issues such as high dropout rates among students, gender discrimination, low status of PE and PE teachers in the country, lack of training and lack of equipment.

Based on the multidisciplinary of team members, the process employed anthropological and technology methods for problem framing and solution framing. From the three initial conceptual ideas, and after consultations with LiiKe, a mobile application as a solution emerged through means of co-creation. We anticipate that the effective implementation of our solution will improve the awareness and importance of Physical Education in schools. We hope this project contributes positively to the efforts that LiiKe is already endeavouring; to provide Tanzanian schools with better Physical Education facilities by empowering the female PE teachers.

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1 Introduction

This is the final report for the course CAPSTONE in Creative Sustainability, where our group worked on a project for LiiKe – Sports and Development. Our project was also a part of Aalto Global Impact's project called Problem Based Learning (PBL) East Africa, which is a joint initiative of four universities to work together on sustainable challenges and share the best practices of problem based learning. During this project our group also worked together with six Tanzanian students. This report, however, is conducted only by the Aalto students.

In this paper we take a look at the sustainability challenge presented to us by LiiKe as well as the research methods we used to solve the problem. After that we will also explain the solutions and recommendations which we created based on our research.

1.1 The client: LiiKe ry

LiiKe – Sports and Development is a Finnish NGO which was established in 2001. The main purpose of LiiKe is to use sports and health education to develop the lives of people living in developing countries. The aim is to help especially the most vulnerable ones: children, youth and women. LiiKe operates actively in Tanzania, but it also has counterparts in 5 other East African countries: Botswana, Zimbabwe, Zambia, Kenya and Mozambique. While supporting sustainability and using sports as the main tool for all the development work, LiiKe also considers four dimensions of wellbeing: financial, physical, mental and ecological.

During the years of its existence, LiiKe has, for example, supported primary and secondary schools in increasing the quality of physical education and health education, improving the sports fields and providing sport equipment and education materials. LiiKe has also assisted some teacher's colleges and universities. For its strong media attractiveness, one of the most visible projects of LiiKe has been to bring FC Vito, a football team put together from Tanzanian children's, to the Helsinki Cup to Finland.

1.2 The challenge

The basic sustainability challenge presented to us was the client's need to improve physical education (PE) within Tanzanian schools. The client believed from earlier work that PE has a positive impact on girls' empowerment, improved pupil health, and reduced absenteeism at schools.

We were expected to base our ground work on interviews with LiiKe, earlier interview data from Tanzanian PE teachers, and research at UDSM's faculty of education. Our challenge was to improve the effectiveness of PE, not just on physical training, but also health education, cultural awareness and the facilitation of social groups' interaction in schools. Evidently, there were many social, political and cultural factors to consider.

We were informed that Tanzanian PE educators face serious difficulties in providing quality PE in schools. These difficulties include: a lack of teacher training, a dearth of continuous on-the-job-training; and limited opportunities for knowledge exchange between PE teachers.

Since 2004, LiiKe has collaborated with Tanzania's Ministry of Local Government and Ministry of Education, local universities and the Teachers' Union to advocate for PE in primary and secondary schools and to implement PE curriculum development projects. The working conditions of PE teachers have been reported to remain underdeveloped and ineffective despite the client's efforts, due to a lack of consistency in PE policy implementation and the relatively low prioritization of physical and health education in school curricula. New avenues were therefore needed to provide knowledge and support to PE teachers across the country.

With this as background, LiiKe and UDSM researchers have investigated initial needs and requirements among PE teachers. Part of the challenge was to develop avenues to help form communities for PE teachers which will enable them to learn from each other and to share best practices among peer groups. LiiKe wished to leverage this knowledge into the user-driven development of a service concept such as a digital application to support the PE teachers. A special request from the client was that our project would focus especially on supporting teachers.



Negligent Admin

- De-motivating admin/ins

INTERVIEW

- worried about their daughters
 - trained by male teachers
- Believe it leads to no good
- Lack of awareness

Parents

- Lack of influence

Many of girls

- Lack of skills
- abstracting

- Not enough time for practical spots

- PE edu. not of value

Other comments

- Teacher's own initiative

Solutions: proposed by interviewees.

Media: said news are educating Parents

2 Research methods

In this section we discuss the different methods we used during our project to gather information on the client, the challenge, the users and the possible solutions.

2.1 Pre-fieldwork

Our project started with a long period in Finland. Due to limited internet connection in Tanzania, we were not able to conduct any Skype interviews and were left to research what we could from what we had at hand. This included reading up on different PE projects already done in developing countries and seeing, if some best practices could be deduced from that research. This was not fruitful.

We also met with the client several times during this period in order to help us understand, what the situation is like in Tanzania from their point of view, what kind of methods could be used to help the situation and what they actually expect. In preparation for the fieldwork, we sketched out a semi-structured interview outline and worked on what are the specific things we want to know from the teachers.

2.2 Fieldwork

During our project we also visited Tanzania for two weeks to conduct empirical research and to work on solving our challenge. In those two weeks, we worked together with six Tanzanian students and their mentors. We had the chance to collaborate with nine Tanzanian PE teachers for three days. All the teachers were female and they worked either in primary or secondary schools in Dar es Salaam, Singida or Morogoro. We used our time with the teachers to interview them and to have workshops with them.

We conducted semi-structured interviews in pairs and small groups. The main aim was to figure out what a normal PE class looks like in a Tanzanian school and how the teachers prepare for it. In addition, we wanted to understand what kind of challenges the PE teachers face in their everyday work. We were also interested in learning, if they have specific challenges in their work because they are female PE teachers.

With the workshops, our aim was to understand more about what kind of solutions would be possible in real life. We had identified several main problems based on the interviews, and therefore in the workshops we deepened our un-

derstanding on them. Our aim was also to guide the teachers to think more profoundly about the problems and possible solutions. We had three kinds of workshops. The first was in small groups, where teachers created solution ideas to problems by going around five stations and writing ideas on post-it notes. The second workshop was held in a way that all the teachers were in one group and the discussion was facilitated by students. We really tried to get the teachers to move on from the solutions that required only money or big changes in the administration or government, as they were things that we could not control in our project. The third workshop focused more on the teachers as individuals. It included, for example, an exercise where the teachers had to think individually what would be one problem and concrete solution they could carry out the next Monday they go back to work.

Our research also included field trips to schools in Dar es Salaam. We visited three primary schools and one secondary school. In two of the schools, we were only able to walk around the school yard to see what kind of playgrounds, sport fields and equipment they had. Unfortunately, we were not able to ask any questions from the kids or the schools' teachers. In the other two schools, we had the chance to discuss with the children and the teachers. However, we needed to be critical on the answers they gave, as we couldn't be sure if they were rehearsed or not.



3 Findings

In this section we discuss the different problems we identified during our research process and especially the ones we considered as focal problems in regards to our project. Several problems were identified some of which were explored more deeply than others.

3.1 High dropout and absence rates

In the context of Tanzanian primary education, a central problem is the high number of students not graduating primary education as well as the high absence rates, both especially among girls. A related concern is the academic performance of students. According to our client, PE teaching can mitigate all these problems. The successes of their projects back up the assertion, at least for drop-out and absence rates. While PE teaching can have a role in solving these problems, solutions unrelated to PE might be more salient. A further challenge is that increasing PE lessons will decrease other lessons (or make the school day longer) and thus potentially decrease academic performance. This assumes studying more increases academic performance, which also is the assumed effect of PE through increasing attendance. For these reasons, these problems were not suitable as the focal problem of our solution.

The logic the client presented is that many children like sports classes, and thus are more likely to attend school, if there is a sports lesson. Also, if students are more physically fit, they have more energy and stay healthier. A girl-specific decrease in drop-out rates stems from PE increasing girls' assertiveness and awareness of their rights and better knowledge of sexual health, which lead to decrease in early pregnancies and child marriages. Learning how to manage menstruation could also decrease girls' absence rates.

3.2 Low social status of PE and PE teachers

Physical education is regarded less important than most other subjects, often referred to as science subject. Government, school administration and parents can thus exhibit negative attitudes towards PE, as it takes time from science subjects. PE is also associated with extracurricular sports activities. Thus, parents might dislike it if children stay after school to play sports and they come home later.

The low status of PE was clearly an important theme to the PE teachers we worked with. We ended up not focusing on this issue, although it is part of pro-

posed future extensions to our solution. The low status shows in the low amount of lessons allocated to PE in the official government-approved syllabus; once per week in primary school and none in secondary school. The administration might also temporarily replace a PE lesson with a science subject. Furthermore, other teachers might sometimes continue their lesson on top of a PE lesson, effectively stealing some students or the entire lesson from the PE teacher. This unstable nature of the PE subject leads some children to think that PE is not a real subject, confirmed first-hand by a Tanzanian team member.

3.3 Low social status of girls and female PE teachers

Parents might have a negative attitude especially towards girls participating in PE. In some regions of Tanzania, the local culture might be against girls participating in PE due to beliefs and taboos intersecting sports and female sexuality. Moreover, the status difference between men and women reflects to female PE teachers having a lower status than their male counterparts.

As the PE teachers we worked with were all women, our findings are based on female PE teachers. On the other hand, very few PE teachers are women, which means that tailoring the solution specifically or exclusively to female PE teachers would make it less impactful. Thus, we didn't include any gender specific component to our solution. Instead, it should cater to female PE teachers while potentially being valuable to male PE teachers as well.

Girls are expected to participate in household chores and possible family business, and PE takes time and energy from that. Moreover, as girls grow up, they are not expected to be able to bring much income to the parents, as women are assumed to have less work opportunities and more domestic duties, and as they are often married off at a young age.

3.4 Lack of equipment

The lack of sports equipment stems from the general lack or scarcity of resources. It was clear that solving this problem directly, either by trying to lobby for more funds for PE teaching, or donating money, was not feasible. While the client has lobbying activities and we considered creating a solution for supporting them, directing the project towards lobbying would have been at odds with working with Tanzanian PE teachers. Donating money would not have a permanent impact and it would not be in line with the client's activities, which are based on getting funds and transforming them into more value than a direct donation would give.

We found out that the teachers use creativity to circumvent the resource problem. They manufacture alternative equipment out of available materials, such as a makeshift football out of rope. When a teacher would tell about these things, some of the other teachers were surprised. These tricks were new valuable information to the teachers. The main advantage was that using these recipes was something the teachers could try out immediately. Also, as the official syllabus required practicing many sports, for which equipment was an issue, there was a very concrete need for juggling the contradiction. The main challenge related to this was that sometimes other teachers or cleaning stuff might throw away the alternative equipment, or students might not take proper care of them. Still, we saw potential in this, and thus it became the primary driver for our solution.

3.5 Lack of PE teacher training

The state of PE teacher education in Tanzania is precarious. PE teachers also lack opportunities for professional development after graduation. According to our client, in recent years, almost all PE teacher training programmes were shut down, due to policy changes in the Ministry of Education. Our client makes educational videos teaching different sports and games, which address the lack of professional development opportunities to some extent. It became a secondary focal aspect.



4 Solution

In this section we discuss the three solution concepts that were presented to the client with the problems they would tackle. Then we will further focus on the one solution chosen by the client to be refined.

4.1 Preliminary concepts

From the workshops came up the idea of a parents' day at school that would allow PE teachers to promote PE and demonstrate how a PE lesson looks like. This would allow showcasing how children enjoy it and dissolve any prejudices against girls doing sports.

Another solution we explored with the teachers was the use of media, as the PE teachers suggested that media could have a significant impact on parents' opinions. However, the idea remained rather vague and no promising solution arose. It seemed that getting media attention requires skill and effort, and even money. Furthermore, it was perhaps too far from the essence of the project.

Our final solution was a mobile application as a knowledge sharing platform used for supporting PE teaching. We had the idea of adding content related to improving the status of PE in schools and among parents. In the end we decided to exclude them for two reasons. The solutions would be specific to a school and a situation, making it hard to get the content right. Also, we felt that the app should have very focused content in the beginning, to avoid overwhelming the user. We propose that content related to improving the status of PE could be included in an update, once the app has gained some traction.

The client chose to move forward with the application concept.

4.2 Final solution

Our proposed solution is a mobile application for PE teachers called "Toolkit for Physical Education Teachers". We built a prototype, and our app concept has the following features:

- 1) Instructions on how to make alternative equipment (including clearing a field for sports)
 - 2) Instructions on different sports, exercises and drills
 - 3) List of games that require no equipment or no special equipment
 - 4) Tool for creating lesson plans of a term or a year
 - 5) Discussion forum and commenting
- In this section we discuss the three solution

concepts that were presented to the client with the problems they would tackle. Then we will further focus on the one solution picked by the client to be refined.

The first feature directly addresses the lack of equipment and facilities by harnessing and disseminating the knowledge in the PE teacher community. It further empowers the PE teachers, as they are no longer as dependent on resources for equipment. In terms of economical and ecological sustainability, using natural and waste materials is efficient use of resources, but if natural and synthetic materials are combined, it creates equipment which might be hard to recycle. This problem can be addressed by selecting and developing solutions that don't mix natural and synthetic materials. The third feature also addresses the lack of equipment. It increases economical and ecological sustainability by promoting activities that require little or no resources. Further, both of these features give poor areas a better access to higher quality PE, increasing social sustainability.

The second feature enables a sort of on-job training, hence supporting professional development, which was another challenge presented by the client. It also extends on the video material the client has already produced. Professional development enables teachers to maintain and possibly elevate their professional status, which improves social sustainability, considering that the PE teacher profession is a low status profession.

The fourth feature, the lesson plan tool, makes it easier for PE teachers to have a more strategic view on their teaching. The teacher could specify objectives of the term for a class she is teaching, such as developing endurance, agility or cooperation skills. This can help PE teachers in professional development, if not explicitly providing teacher training, as the teacher has a clearer picture of how her teaching choices impact the students' development. This also benefits the students. The sustainability benefits are mainly social; PE teachers and children fare better. The teacher could also preselect some activities, to allow catering to the students' and the teacher's preferences. The teacher could also specify the amount of variability she prefers during a day; to what extent she wants to teach the same activity for different classes during the same day.

The tool would create lesson plans based on the official syllabus and the parameters the teacher has entered. The plan would link to the app content relevant to the lesson in question. It could even suggest similar or alternative activities, when the activity of the official syllabus is infeasible. We only ideated the lesson plan tool features, and thus the conceptualisation is left for the app development. We thought that a good benchmark for developing the feature are existing workout apps that create personal training schedules.

The fifth feature, content comments and a discussion forum, allows teachers to interact, guide each other and voice their opinions, helping in creating a community. The idea of building a community was among the earliest ideas the client presented. This stemmed from an app concept called “Moja”, developed for the client in a hackathon.

We had long discussion on whether we should have the commenting feature and the discussion forum. One aspect is that user inputs need to be moderated somehow, which requires labour. Also, teachers would most likely have different levels of access to the internet, which would mean some teachers could have a lively conversation, while others might only see new comments after a month or an even longer time. The Tanzanian students and the client saw this as less of a problem. The app could show the comments most relevant to a user’s comment, once she gets access to the internet. And even with low bandwidth networks, or even using SMS, textual data can be transferred.

Overall, the solution improves the conditions of PE teaching and PE teachers. It empowers the teachers to take a better control of their situation and to better use, what they have, to improve their circumstances. Empowerment can have positive psychological impacts. Better PE lessons lead to higher job satisfaction and most importantly, enhances the benefits of PE on children’s educational attainment, health and future. These benefits relate most directly to social sustainability.

4.3 Limitations

Considering that in Tanzania, internet access is usually paid by the amount of data, and that internet is simply not always available, installing the app is not a trivial matter. We propose that the client introduces the app to a group of teachers invited to a workshop. The client could bring a decentralised cloud storage device to this session. The device would create a local wi-fi network, through which the teachers could download the app from the device avoiding paying for internet access. Other possibilities include installing the app from USB sticks or a memory cards.

Our solution requires the teachers to have smartphones, and with an internet access, it is easier to get hold of the app (assuming it will be made publicly available for download). While it is possible that not all PE teachers have a smartphone, it is safe to assume smartphones become more prevalent every year. Similarly, internet access will become more available and of better quality in the future. Thus, our solution seems to be technically feasible from the user side.

STRENGTHS

Sustainable solution (no materials needed, no waste produced)

Concrete support for PE teachers

High potential for reaching new users

User-friendly (simple and intuitive features)

WEAKNESSES

User's perspective: Requires a smartphone and internet data (to download and use the comment features)

LiiKe's perspective: Requires content production and updating

OPPORTUNITIES

Increase collaboration between teachers thanks to comment and forum sections

Help teachers in their professional growth

THREATS

Lack of interesting and useful material

Difficulty in finding users

Lack of resources from LiiKe

SWOT-analysis of the final solution concept.

4.4 Prototype

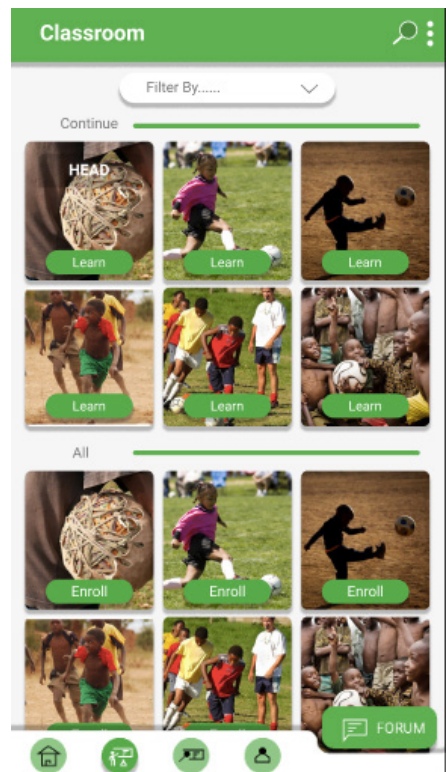
In the home view (picture 1), the user will be able to find the latest updates on LiiKe's projects as well as the videos and guides regarding PE teaching. On the up-right corner it will be possible to find Settings, Help and Feedback. The Feedback is especially important for this app because it will allow the user to be able to communicate if something is not working properly or what type of content would be useful in the app. In the downright corner the user can click the forum button and access a view where users can discuss with each other. In the bottom of the view is the main menu, which has four icons as options: home, exercices, equipments and profile.

By clicking exercices the user ends up to a view (picture 2) where different exercices are shown. After that the user can pick one of the topics and see the instructions and possible video on how to teach the chosen skill (picture 3). After scrolling down the same view (picture 4), the user also has the possibility to comment on the helpfulness of the material and interact with other users. It is also possible to "vote" whether or not it was useful by choosing between two arrows.

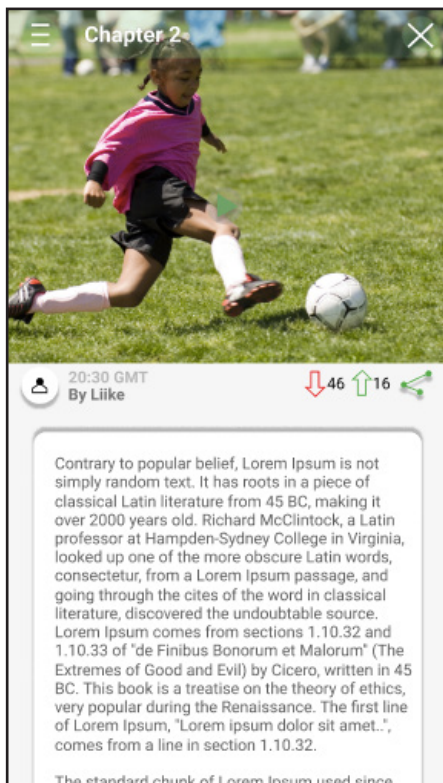
By clicking the equipments from the menu, the user will see a view which is similar to the exercices, but the materials will be instructions on how to make equipment from waste material. By clicking the option profile from the menu the user will access a view with his or her information.



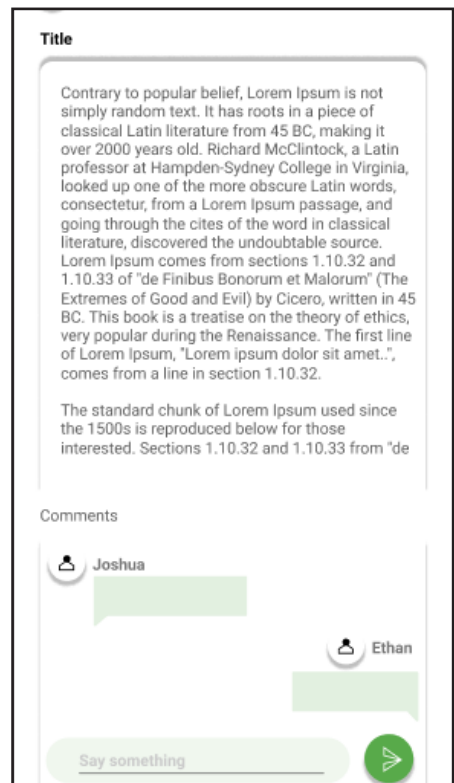
Picture 1, Home -view



Picture 2, Exercises -view



Picture 3, Single exercise -view



Picture 4, Commenting -view



5 Recommendations

In this section, we discuss the different future avenues that could be explored by the client in order to develop the application concept further. In addition, we recommend a “1-hour with the teacher” adoption plan to aid with introducing the concept to the end user.

5.1 Next steps

The first step for LiiKe would be to find the right partners for the app. We believe that the best solution would be to partner up with the University of Dar es Salaam that can help with making the app content. Regarding the most technical part, our suggestion is to find a third party company that specializes in app development or to find a university partner, whose students might be interested in developing the app. To make sure that the app is useful for the teachers, we suggest that a workshop is held in Mtwara with the potential users so that they can co-create this solution. This will not just help making the product better, but will also help them feel like contributors and will enhance the probability of success.

LiiKe would need to decide how often new updates can be available and how to let the teachers know, when they can download the newest version. We would also suggest finding a communication channel between LiiKe, the organization who is in charge of the content and the teachers, so that there can be an easy flow of communication and requests. A possible alternative could be a WhatsApp group, although we suggest avoiding having too many people interacting and instead choosing representatives for all three parties.

5.2 One hour with the user

One important part of developing an application is making sure to have a plan on how and why the intended users would start using the application. To further support this, we propose a simple structure for a “One hour with the user” -event.

To introduce the app, we suggest gathering the PE teachers in Mtwara, with a special attention to the most “famous” teachers or the ones that are considered leaders in the teachers’ community. The first thing would be to make everyone download the app and play with it for a little while, in order to get familiar with the different functions. After that, it would be good to have an activity for the teachers, either ask them to make some sport equipment following the tutorials or plan a PE class using the tool in the app. The wrap-up would consist of gathering first impressions and feedback and giving the date for the next update of the app.

Proposed agenda for a 1-hour guided interactive session with PE teachers:

1. Help teachers install the app
2. Let teachers play with the app
3. Present what the app offers
4. Facilitate teachers to make alternative equipment
5. An alternative: ask teachers to plan a PE class with the app
6. Gather feedback and give information about next versions of the app

We believe this simple exercise structure would greatly support the adoption of the application into use by the teachers and thus improve its spreading and usefulness.



6 Conclusions

During the time we spent on this project and especially during our field trip, we have learnt that the problems faced daily by female PE teachers do not have a simple solution. Some of the problems require an investment from the school, the government or a third party, while some would require a big change in the culture and in the society. Unfortunately, we could not deliver any of those solutions. Nevertheless, we feel that the only way to change the system is to start with small and concrete solutions. We believe that by giving the teachers the tools to be better at their job, we are helping them fight for better conditions and start a movement that will hopefully raise the awareness on physical education. It was clear to us that the teachers we interviewed, and we believe all female PE teachers in Tanzania, are passionate and willing to go the extra mile in order to prepare their students and help each other.

All the insights and possible solutions we got from teachers were valuable and should be considered in Liike's future plans and teachers should be included in the decision process. In our experience, co-creation is the best way to deliver a solution that can really resonate with the final users and enhance the probability of its success.

We are very grateful for being part of this project and having the chance to experience a beautiful country and meet some amazing people. We hope our solution is developed into a real app that will help PE teachers in their daily tasks and will motivate them to keep fighting for sport development in Tanzania.

Asante sana!