

# Graduate Engineering Students Navigate Cultural Differences to Design Mobile Prenatal Care App for Rural Africa

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## **Tags**

Cross-Cultural Issues; Experiential Education; Internationalization and Global Learning; Student Learning and Development; University/Higher Education

## **Setting**

Over 80 international students from 19 countries in Africa arrived at a renowned global research university in Kigali, Rwanda. They attended new student orientation and began their journey to pursue a master's degree in engineering focused on information technology, artificial intelligence, or electrical and computer engineering. Upon arrival, the students were excited to participate in a four-week orientation program consisting of academic lectures and group activities aimed to prepare them for the rigors of research-intensive graduate studies. During the fourth week of orientation, students were divided into diverse groups to work on a team project.

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## Case

Seven students, each with their own unique cultural background and ambitions, were placed in a group and radiated intellect and confidence. Halima, a soft-spoken but determined young woman from Rwanda, politely greeted her teammates. Ayo, a quick-witted engineering whiz from Nigeria, had a gregarious laugh that echoed through the corridors. Maurine, from Kenya, embodied a quiet confidence and her eyes sparkled with curiosity. The team composition was as follows:

| Team Member | Country  |
|-------------|----------|
| Amani       | Burundi  |
| Jabari      | Cameroon |
| Kwesi       | Ghana    |
| Maurine     | Kenya    |
| Ayo         | Nigeria  |
| Temidayo    | Nigeria  |
| Halima      | Rwanda   |

The topic for the group project was "Digital Technologies for Healthcare in Africa." Professor Mamnusa, a renowned researcher in health informatics and artificial intelligence, tasked the teams to design a health app that addresses a specific healthcare challenge in Africa. Earlier in orientation, students had engaged in intense programming sessions and individual and collaborative group exercises. By the fourth week as the projects got underway, the team was brimming with excitement, but underlying tensions soon emerged.

Ayo, who was used to the fast-paced environment of Lagos (the largest city in Nigeria), immediately began outlining features. "We need a modern and user-friendly interface with real-time data collection!" he declared enthusiastically.

However, Halima expressed concerns. "Not everyone has access to smartphones in rural Rwanda. We need a solution that's inclusive." As the lively discussion ensued, tensions rose between group members and cultural differences emerged on the best approach to design a health app that is inclusive in addressing the needs of rural diverse populations. Ayo's focus on cutting-edge technology clashed with Halima's awareness of the digital divide prevalent in many countries in Africa.

Kwesi, the Ghanaian with a gentle demeanor, intervened and stated "Let's brainstorm ideas first. Everyone has valuable insights to share." Amani chimed in with a specific challenge for the group to consider for a project: the limited access to prenatal care in remote Kenyan villages. This project topic sparked energetic conversation and common interest that steered group members towards exploring potential solutions for this issue.

Gradually, the group evolved, and team members began to acknowledge one another's viewpoints. Realizing the importance of inclusivity, Ayo proposed adjusting his cutting-edge design for compatibility with less advanced mobile phones. Halima recognized the value of Ayo's enthusiasm and realized the potential for future expansion using newer technologies. This open dialogue fostered a spirit of collaboration and compromise among group members.

Jabari's artistic sketches ignited further discussion, which resulted in the inclusion of visual icons that bridge language barriers more effectively than text. Despite minor friction between his aesthetic approach and Ayo's tech-focused mindset, group consensus emerged through spirited debate and continuous refinement of the health app design.

Temidayo's coding skills proved invaluable, not only in building the prototype but also in suggesting ways to streamline features for older devices. Halima's crucial insights emphasized the need for culturally appropriate content, resulting in consultation with local health workers. Initially reluctant, Ayo embraced the importance of getting input from those who would directly use the app.

Halima suggested the name "Team Ubuntu," which underscored their growing unity. The term "Ubuntu" describes a sense of interconnectedness between individuals, society, and the environment. Despite their diverse nationalities, academic backgrounds, and cultural perspectives, the team bonded over their shared determination to make a tangible difference by expanding healthcare in rural communities in Africa through the emerging digital technology arena.

With collective pride, Team Ubuntu presented their group project proposal of a mobile app (accessible on smart and basic cell phones) that offered basic prenatal care information in various native languages. The team designed a mobile app that would be used by both healthcare professionals and expectant mothers in remote areas. During their presentation, team members highlighted how the mobile app addressed the digital divide while promoting digital literacy through microlearning tutorials.

Professor Mamnusa and their fellow students were impressed with the Team Ubuntu project. With excitement she said, "This project exemplifies the power of diverse perspectives and a cooperative team solidarity. You have identified an innovative solution to address a challenge for healthcare professionals and expectant mothers in rural areas across Africa".

Team Ubuntu shared that, from the outset they "were slow to recognize the individual assets of team members and how collective Pan-African experiences can contribute to the project". During the Team Ubuntu debrief session, group members celebrated their newfound appreciation for the power to respect cultural differences, embrace cross-cultural expression, and collaborate to jointly address a challenge.

## Discussion Questions

As you consider this case, discuss:

- Examine this group through the framework of Tuckman's Stages of Group Development. Where did you see the evidence of each stage? What likely caused each transition to the subsequent stage?

- For context: According to psychologist Bruce Tuckman, there are five successive phases of group development, and they are: Forming, Storming, Norming, Performing, Adjourning. Another way to think of these five stages are: (1) orientation, (2) intragroup conflict, (3) cooperation and integration, (4) synergy and (5) transformation.
- How did the group navigate conflict, particularly the tension between Ayo's tech-centric vision and Halima's focus on inclusivity?
- Analyze why a specific leader did not emerge within the group. Explain why the absence of a group leader did not hinder the effectiveness of the team.
- How might the group dynamics have differed if members lacked cultural awareness and emotional intelligence?
- Explain how group members strategically used their Pan-African cross-cultural differences to individually contribute to a solution to a complex global problem, such as healthcare access and the digital divide in rural communities in Africa.