

Ujamaa and Universal Design: Developing Sustainable Tactile Curricular Materials in Rural Tanzania

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ABSTRACT

Purpose: *This article illustrates the power of collaboration in the spirit of Ujamaa to build curricular materials that can engage and support the learning of a diverse group of students in under-resourced environments. The authors reflect on their personal experience overseeing collaborative service learning projects with Tanzanian partners through a study abroad programme.*

Method: *The service learning project took place in a rural primary school in northern Tanzania, characterised by large class sizes and the unavailability of teaching and learning materials. Tactile curricular materials were collaboratively developed by Tanzanian student teachers, practising teachers, and American undergraduate students. Locally available and recyclable materials were used, such as plastic water bottles, tubing, plastic bags and cardboard boxes.*

Results: *Examples of curricular materials that were developed are presented, and lessons learned through the experience are shared.*

Conclusion: *The use of locally available, recyclable materials enhanced sustainability. Having sustainable curricular materials that are accessible to a diverse range of students in under-resourced educational settings has the potential to foster learning for all. The underlying cultural concept of interconnectedness or Ujamaa strengthened the collaborative relationship between participating teachers and students, and can be drawn upon to enhance future service learning and international development efforts in education.*

Key words: *universal design, sustainable development, service learning, Tanzania*

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INTRODUCTION

Universal Design for Learning (UDL) is an approach to curriculum and instruction designed to enhance access to education and multiple pathways to learning for diverse students. Initially construed as a philosophical and technological approach to teaching via multiple means of representation, response, and engagement that best align with students' learning styles (Rose & Meyer, 2002), UDL was primarily proposed as a means for including students with disabilities in general education classrooms. Now, the utility of UDL has expanded to a more general framework that can improve educational outcomes for all learners by making the curriculum more universally accessible to students with and without disabilities alike. For example, UDL would promote the use of tactile three-dimensional curricular materials that would jointly support kinesthetic learners who learn best by active touch and doing, as well as learners with a visual impairment who primarily learn through their sense of touch.

This article presents and reflects on 2 case examples of curricular materials that were collaboratively constructed by Tanzanian primary school teachers and American undergraduate students during a study abroad community engagement experience in rural Tanzania. Although the teachers and students did not intentionally operate from a technical UDL framework, UDL principles were organically applied during the creation process by innovatively using sustainable materials to build the curricular materials. The curricular material creation process highlights the humanistic approach that builds upon collaborative relationships (i.e., the Ujamaa principle), providing examples of teaching and development practices based on a human-centred approach. Ujamaa is a sociopolitical concept that emerged from President Julius Nyerere's (1968) development plan, the Arusha Declaration, and is translated to mean 'family-hood'. Nyerere thought of Africa as one family and the whole world as an extended family, and today many Africans still think of themselves in the context of this extended relationship with the world (Gathogo, 2008). It is hoped that the lessons learned from this experience can be incorporated into broader UDL and inclusionary educational reforms and practices in developing contexts.

Tanzanian Context

Tanzania is the largest and most populous East African country, with a land mass of 947,300 sq km and a population of nearly 54 million people (Central Intelligence Agency, 2018). Most of the land is used for agriculture and the majority of the

population lives in rural areas. The study abroad community engagement experience that is the basis of this article took place in a village primary school, characterised by large class sizes and the unavailability of teaching and learning materials (Wadsworth, 2015). Accordingly, students and the practicing teachers collaboratively designed and created curricular materials with locally available and recyclable materials such as plastic water bottles, tubing, plastic bags and cardboard boxes. In this way, if the curricular materials broke through use over time, the teachers could easily and affordably repair them.

METHOD

The examples presented below are based on the authors' personal experience overseeing collaborative service learning projects with Tanzanian partners through a 6-week summer study abroad programme that took place in a Maasai village in Northern Tanzania. The goal of the programme was to provide the students with classroom and experiential opportunities to learn about education and development in Tanzania. To help meet the needs of the local community, a collective decision was made with Tanzanian partners to create curricular materials that teachers could use in their under-resourced classrooms. Tanzanian student teachers worked with the primary school teachers and the American study abroad students to build curricular materials by hand, using locally available and recyclable resources.

Curricular Material Case Examples

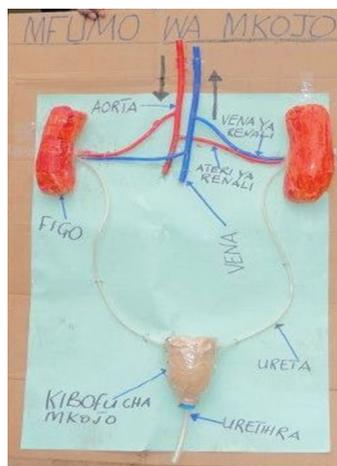
Example 1

The first example of an accessible, sustainable curricular material that was made by our students, Tanzanian student teachers, and primary school teachers is a tactile urinary system poster.

Figure 1: Urinary System curricular material in progress



Figure 2: Urinary System curricular material completed



As can be seen in the in-progress photograph (see Figure 1) and finished product photograph (see Figure 2), the poster was constructed using cardboard, manila paper, tape, tubing, and plastic water bottles. The various parts of the urinary system were created using these locally available materials and were then labelled in Kiswahili (the primary local language) with coloured markers. Due to the tactile nature of this poster - with the three-dimensional tubing and bottles fixed onto the two-dimensional poster surface - students with visual impairments and kinesthetic learners could use their sense of touch to physically feel the different parts of the urinary system, thereby aiding in their learning of the science curriculum content.

Figure 3: Respiratory System curricular material



Example 2

The second example is a respiratory system demonstration device.

As can be seen in Figure 3, this was made using a large plastic water bottle, tubing, balloons, plastic bag, and rubber bands. A science teacher could demonstrate how lungs expand and contract during breathing by pulling the bottom of the plastic bag up and down. As the teacher demonstrates and explains the process of the respiratory system, students can watch the balloons (i.e., lungs) fill and empty with air. Using this curricular material could help support the learning of hearing impaired and visual learners, allowing them to physically see how the respiratory system functions.

RESULTS and DISCUSSION

Reflecting on the experience, the authors identified 5 key challenges and areas for improvement related to collaboration, teacher buy-in, teacher capacity, language barriers, and the availability of resources. The lessons learned are summarised below.

Collaboration

An important lesson that became apparent even before the programme came to an end was that teaching and learning is a collaborative activity. Working collaboratively had personal and professional benefits for everyone involved (i.e., the Tanzanian partners, the undergraduate students, and the authors themselves). The decision to work solely with teachers for the service learning component of the study abroad programme was initially made from logistical concerns. When the programme began in Tanzania, the school year had just ended and it would have been logistically difficult to ask the students to come back to school. Brunner (1985) posits that collaborative learning environments have better student outcomes. Therefore, involving students in this manner would have been useful in motivating students who were already experiencing insurmountable difficulties in school. While working in partnership with the primary school teachers provided the opportunity to collaboratively create sustainable curricular materials that could be used in their classrooms, there is the feeling that also involving students in the creation of the materials would have been even more beneficial.

Teacher Buy-In

One of the challenges was to convince teachers that this exercise was a worthwhile endeavour. The primary school teachers with whom the authors interacted felt overworked and under-appreciated. They faced numerous daily challenges such as large class sizes, extremely difficult working conditions, lack of resources, and low pay. Such challenges are compounded by time constraints that demoralise teachers and inhibit creativity. Additionally, due to pressures of annual high-stakes standardised testing, the teachers were reluctant to take on additional tasks that they were unsure would translate into positive academic outcomes for their students. Thankfully, over time the authors were able to overcome these challenges and convince teachers that the sustainable tactile curricular materials would be invaluable for their instructional practices and student learning. If the teachers had not been convinced, the authors acknowledge that their efforts would have had far less impact.

Teacher Capacity

Related to the initial reluctance displayed by teachers, it was found that teachers were not sure how to effectively use the curricular materials that they developed to accomplish learning goals. In a context where professional development is limited (particularly for educating students with disabilities) and teaching is heavily focused on preparing students for standardised tests, it was not surprising that the teachers lacked confidence in their ability to develop relevant curricular material that would help improve student learning. To respond to this need, the authors' role evolved to help the teachers see the pedagogical connections between the curriculum, learning objectives, and instructional materials. Furthermore, explanations were made about how the tactile and visual elements of the materials would enhance the accessibility of the academic lessons for a diverse range of students. It was also sought to equip teachers with the skills and knowledge to generalise the work, so as to be able to create additional curricular material, using a similar approach, in the future. Building teacher capacity is imperative in the quest to develop curricular materials that can effectively support student learning.

Language Barriers

Another limitation was the language barrier between the American undergraduate students and the Tanzanian counterparts. A number of the collaborating teachers

spoke limited English, while some of the American students barely spoke the local language, Swahili. This resulted in communication problems, which sometimes impacted the ability to work together cohesively. This experience demonstrated the importance of addressing language barriers for effective collaboration and professional development.

Availability of Resources

Finally, while developing curricular materials using locally available recyclable materials is a worthwhile cause, in poor rural communities that lack resources this can be extremely challenging. It was very difficult to find recyclable material, given that many people do not have the financial means to purchase resources that end up as recyclable material. While it is felt that this approach of using locally available recyclable material is more sustainable than bringing foreign curricular materials from the U.S. that cannot be locally repaired or replaced, it is acknowledged that the availability of all resources (recyclable or not) is limited in poverty-stricken environments.

CONCLUSION

Reflecting on the lessons learned during this collaborative service learning experience, the authors would like to offer some concluding thoughts about the value of this type of work and how it relates to the broader themes of UDL and Ujamaa. First, it is felt that the collaborative nature and use of locally available, recyclable materials enhanced the sustainability of these efforts; those factors enabled the Tanzanian student teachers and primary school teachers with whom the students collaborated to continue to work together to develop new curricular materials after the authors left, and repair those that were made together. It is too often the case that international development projects and initiatives end abruptly when the outside partners leave (Hodgson, 2004; Rich, 2007).

Additionally, there is great value in the engaging and UDL nature of the curricular materials that were developed, particularly in resource-stricken educational contexts in developing countries like Tanzania. By incorporating multiple modes of learning (i.e., visual and kinesthetic), the curricular materials make the academic content more accessible to students with and without disabilities alike. Having these sorts of sustainable curricular materials that are accessible to a diverse range of students in under- resourced educational settings has the potential to

foster learning for all, which is aligned with the current global policy initiatives of inclusive education and the United Nations (2015) sustainable development goal of quality education for all children.

Lastly, these case examples illustrate the power of collaboration in the spirit of Ujamaa to build curricular materials that can engage and support the learning of a diverse group of students. The authors feel that this underlying cultural concept of interconnectedness and unity strengthened the collaborative relationships between the Tanzanian student teachers, primary school teachers, and the participating students, and encouraged the creation of accessible curricular materials. It is hoped that the spirit of Ujamaa can be drawn upon to enhance future service learning and international development efforts to support the education of all the world's children.

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