An Interpretation of Universal Design for Learning and its Application in the Competence-Based Curriculum

Mungai Njoroge

Abstract

The competence-Based Curriculum (CBC) mission of *nurturing every learner's potential* has a rights-based quality education dimension that emphasizes the need for inclusion of all learners in the learning process. It places more responsibility of adaptation on the education system rather than the individual learner. The Universal Design for Learning (UDL) framework provides significant others in the education system, such as teachers and education administrators, with the necessary support to plan for learner-centered instruction. This aims at reducing barriers learners may face in the classroom and increasing access to opportunities to succeed in their learning. Through this article, I share an interpretation of UDL principles. The article gives examples of how to actualize the three principles of UDL to support the inclusion of all learners in the learning process.

Keywords

Competence-Based Assessment, Competence-Based Curriculum, Inclusive education, Meaningful learning, Universal Design for Learning,

Introduction

One cardinal duty of a teacher is to facilitate the implementation of quality education, which in the context of Universal Design for Learning (UDL) is characterized by the inclusion of all learners in the teaching and learning process at whatever level of schooling. The mission of the Competence-Based Curriculum (CBC) of nurturing every learner's potential has a rights-based quality education dimension that underscores this responsibility instituted upon teachers. Beyond teachers knowing what to teach and how to teach it, the quality transition of their knowledge to practice during instruction is an essential competency in facilitating meaningful learning by students. Significant interpretation of UDL can provide teachers with the necessary support in the implementation of their cardinal duty for the effective implementation of the CBC in Kenya.

Universal Design for Learning

The Universal Design for Learning (UDL) is an instructional framework based on scientific insights into how humans learn that targets to develop and enhance learning opportunities for all learners (Centre for Applied and Special Technology [CAST], 2018). UDL framework is structured around three principles: 1) provide learners multiple means of representation; 2) provide learners multiple means of action and expression; and 3) provide learners multiple means of engagement. The following are brief descriptions of each principal and a sample interpretation to support application by teachers.

1. Providing multiple means of representation to learners

The first principle is on providing learners *multiple means of representation* to enhance recognition networks, – The "what" of learning (CAST, 2018). It focuses us to reflect on flexible ways to present what we teach to support meaningful learning by all learners. To understand how this principle

works, let us consider an example of content in mathematics on how a teacher can guide students to work out the following question: "*Mfugaji* enterprise farm sells a day-old chick for KSh. 200 each in the poultry market. How much income is made if the farm sells 300 chicks?"

Three forms of mathematical representations (i.e., Graph, Symbol, and Table) can be used to guide students in determining the income made from the sale of the 300 chicks, as demonstrated in Figures 1 & 2 and Table 1.
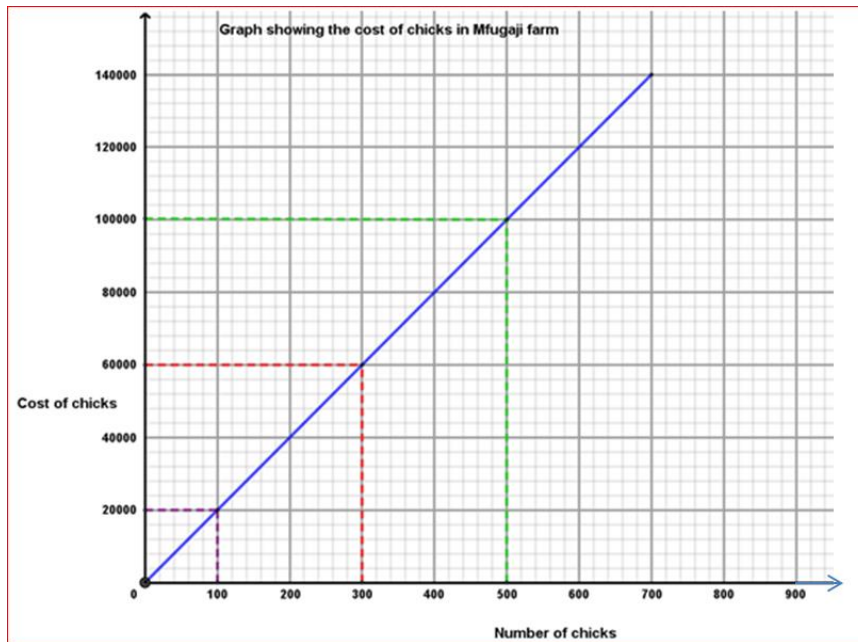

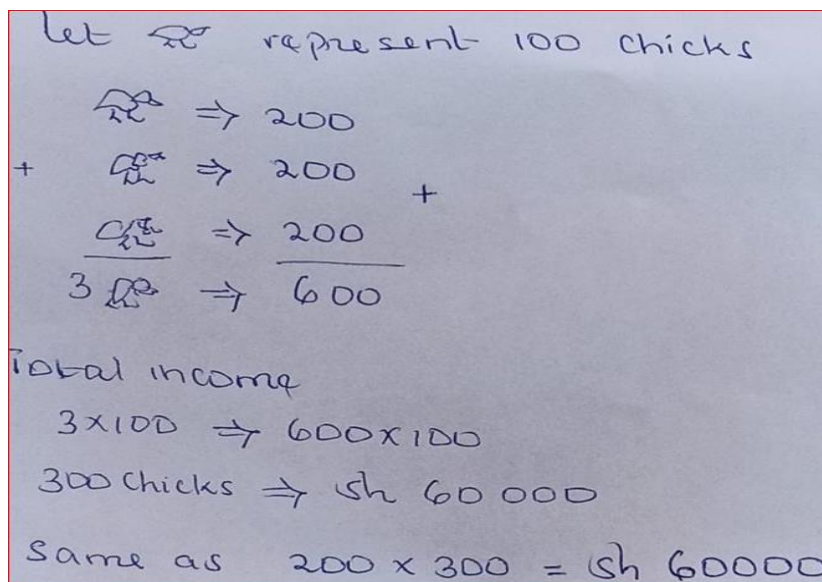**Figure 1. Graphical representation**

Figure 2. Symbolic representation

Table 1: Table representation

Number of chicks	Expression of chick cost (KSh.)	Total cost (KSh.)
1	200(1)	200
2	200 (2)	400
3	200 (3)	600
4	200 (4)	800
n	200 (n)	200n
300	200 (300)	60000

The three forms of representations present learners with a choice of alternative methods to determine the solution to the question. Importantly, learners are in a position to make sense of the solution based on the representation that best appeals to their reasoning. Visual learners may prefer graphs while logical learners may prefer table and symbol representations.

2. **Providing learners multiple means of action and expression**

The second principle is about providing learners *multiple means of action and expression* to sustain strategic networks – The "how" of learning (CAST 2018). This principle focuses us to reflect on flexible options for how we learn and express what we know.

In planning a lesson, a teacher ponders not only on how learners will show what they have learned but how they will demonstrate mastery of learning – making learning visible. Teachers are encouraged to provide learners with choices, where necessary and appropriate, for demonstrating what they have learned. For example, teachers can provide learners an option to demonstrate their understanding of scientific phenomena (e.g., factors affecting pressure in liquid). Some learners can design an activity (or project) to demonstrate the application of a factor affecting pressure in the liquid. Figures 3 and 4 show sample projects students can engage in.

Figure 1: Aquaponic project for mixed crop cropping (Watermelon, Spinach and *Nduma*)

Source: Moi Girls Vokoli in Vihiga County

The projects in Figures 3 and 4 are based on Aquaponic farming technology. Aquaponic farming relies mainly on water and substrates (sources of nutrients) added to the water to enable the growing of crops.

Learners can create (or source) digital content to demonstrate a similar understanding of the application of factors affecting pressure in liquids. Advancement in digital technology provides 21st Century learners with flexible and accessible environments to successfully take part in their learning and articulate what they know through digital tools (hardware devices and software applications). Consider various content youths are creating today mostly using handheld mobile devices and software applications, such as YouTube

Figure 2: Aquaponic project for rice farming

channels and social media applications (e.g., Tik Tok and Instagram). Digital literacy which is a key component of the CBC can be tapped and enhanced among learners through assignments and assessments that allow for their integration where applicable.

Providing students with opportunities to express their learning (e.g., through projects, oral submissions, or written tests) where applicable, then requires the use of a harmonized grading criteria. The grading criterion requires focusing on the learning outcomes rather than the format of assessment. For example, a rubric can support the assessment of the two ways (project design or digital project) that learners use to demonstrate their understanding of the application of factors affecting pressure in liquids.

3. **Providing learners multiple means of engagement**

The third principle is about providing learners *multiple means of engagement* to boost effective networks – The "why" of learning (CAST, 2018). This principle focuses us to reflect on flexible alternatives for supporting motivation to learn, such as tapping into learners' interests and challenging them appropriately. **There is no single means of learner engagement ideal for all learners in all contexts**; providing multiple alternatives for engagement is indispensable (CAST, 2018).

Linking concepts learned in class to the contextual application is one way that teachers can engage learners and support motivation to learn. Figure 5 illustrates ways learners may be in learning opportunities outside the classroom contexts.
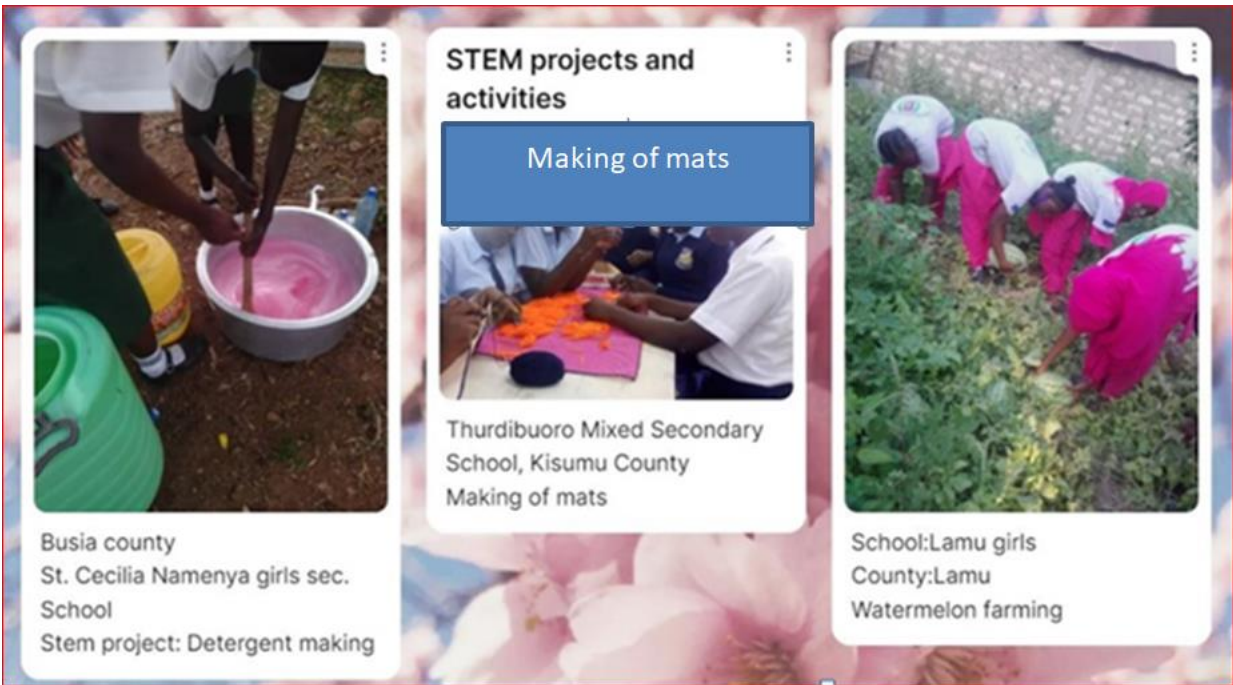
Figure 5. Learners engaged in outside the classroom learning opportunities

Figure 5 shows projects on STEM that were shared by Principals from St. Cecilia Namenya Girls, Thurdobuoro Secondary school, and Lamu Girls during a sensitization program for Principals from STEM Model schools organised by CEMASTEA in 2021.

Outside the classroom learning opportunities, such as those illustrated in Figure 5, can prepare learners for future careers and solve problems that can lead to sustainable development. CBC considers this through aspects such as Community Service Learning (CSL) and Core Competencies (e.g., critical thinking and problem solving, imagination and creativity). Figure 6 gives a summary of the steps involved in Universal Design for Learning
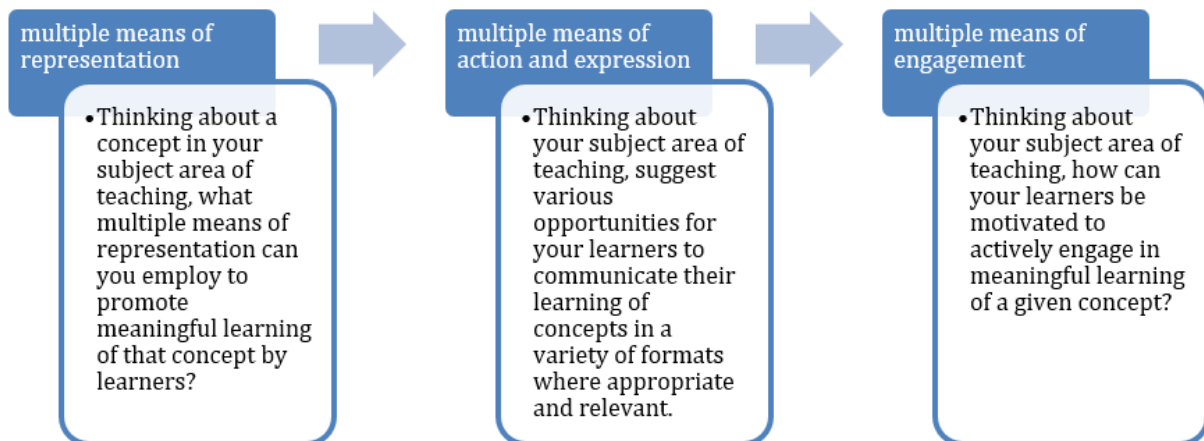

Figure 6: A summary of the steps involved in Universal Design for Learning

Conclusion

All learners must be included in the teaching and learning process. The Universal Design for Learning principles essentially supports this by guiding teachers on how to 1) contextualize instructional practices to mitigate barriers that learners may encounter in the classroom and 2) increase learners' access to opportunities to succeed in the learning process. This is important in supporting the realization of the Competence-Based Curriculum (CBC) mission of *nurturing every learner's potential*.

References

Basic Education Curriculum Framework [BECF]. Retrieved https://kicd.ac.ke

CAST [Centre for Applied and Special Technology] (2018). Universal Design for Learning Guidelines version 2.2. Retrieved January 5, 2022, from http://udlguidelines.cast.org

CAST [Centre for Applied and Special Technology] (2022, January 5). *About Universal Design for Learning*. https://www.cast.org/impact/universal-design-for-learning-udl

U-M Canvas. (2022, January 4). *Principles of UDL*. https://umich.instructure.com/courses/200/pages/multiple-means-of-action-and-expression?module_item_id=971506

Author Information

Mungai Njoroge
Centre for Mathematics, Science and Technology Education in
Africa (CEMASTEA)
P. O. Box 24214 00502 Nairobi
Email: jmungai@cemastea.ac.ke