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Effect of Concept Mapping Teaching Method on Secondary School Students' Acquisition of Life Skills through Religious Education in Ndhiwa Sub – county, Kenya

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Abstract:
Religious Education (RE) is a carrier subject of Life Skills content in Kenyan Secondary School Curriculum. The purpose of this study was to establish the effect of Concept Mapping teaching Method (CM) on secondary school students' acquisition of life skills through Religious Education in Ndhiwa Sub- County, Kenya. The study adopted a Quasi Experimental Research Design involving Solomon Four Non – Equivalent Group Design. The population of the study was all Form Four RE students in public co- educational day secondary schools. Purposive sampling technique was used to select 169 students and simple random sampling was used to determine four schools with similar characteristics to participate in the study. RE students' Life Skills Test was used to generate data. RE teachers were provided with a CM guide for teaching the experimental groups the selected RE topic. The reliability of the tool was estimated by use of Kuder Richardson's Formula and the reliability coefficient was .78. Data was analyzed with SPS. The research question was tested at α= .05 using a t- test. The study results indicated that CM positively affects secondary school students' acquisition of life skills. The t- test results indicated that the difference between the mean gains was statistically significant at .05 in favour of the experimental group. The study concluded that there is a significant relationship between the life skills acquisition of students taught RE using CM and those taught using the traditional methods. Teachers need to use CM to enhance their life skills pedagogical approaches so as to attain the intended objectives of learning RE.

Keywords: Acquisition, concept mapping, religious education, curriculum, life skills, traditional method

1. Introduction

Life skills are the abilities that enable the students to develop adaptive and positive behavior so as to effectively deal with the challenges and demands of everyday life, Kenya Institute of Curriculum Development (KICD, 2006). The teaching methods that teachers plan to use in the teaching of life skills therefore, should be those inculcate the skills among the students. CM in this study is used as an umbrella term for a variety of learner- centered teaching techniques which facilitate active, reflective and meaningful learning (Otewa, 2016). These techniques include; role play, self-awareness test, case based small groups and the use of game. In Kenya, RE is one of the subjects with life skills content in its curriculum, thus making it a life skill content carrier subject (KICD, 2006).

Life skills enable the students to have good critical thinking skills, interpersonal relationships, to develop a sense of self- respect and respect for others as well as contributing positively to the transformation of self and the society asa whole (Xaxx, 2014). Students who acquire life skills competency are able to arrive at moral judgments, thus, can avoid acts like alcohol and drug abuse, school bullying, stealing, school unrests and examination cheating among other social ills (Prajapati, Sharma & Sharma, 2017). The choice of the teaching method in religious education depends on content, availability of teaching resources, previous knowledge of the learner and teacher's versatility (Telima & Doris, 2016). In this study, concept mapping teaching method is used with religious education teachers as an intervening variable to investigate students' acquisition of life skills. Students in the control group were taught using the traditional method.

1.1. A Review on Traditional and Facilitative Instructional Approaches

The traditional strategy (teacher-centred) are those methods whose aim is to impact knowledge, values and skills to learners (Githua et.al, 2009). These methods include; lectures, narratives, text reading, audio-visual presentations and demonstrations. According to (Ayot & Patel, 1992) lecture teaching method is a process by which facts are transmitted from one note book of the instructor to the note book of the learner without passing the minds of either, further lecture is understood as the earliest form of transmission of information from a scholar to the learner. Pagan (2014) describes traditional teaching methods as "subject material reproduction" which emphasizes examination scores and final answers rather than the way the learners arrive at the answer. Traditional methods of teaching encourage learning method like rote memorization in which learners commit blocks of information to memory. Such blocks of information may include a question and its answer (Otewa, 2016).

The instructor-centred method of teaching is a challenge facing the teacher trainees (Tella et.al, 2010). The method does not allow the teacher trainees to enjoy their lessons and directly pass the same to their learners who therefore miss the benefits of intellectual discovery in that they are basically passive and expect knowledge to come from the instructor. Traditional methods of teaching do not stimulate the students' innovation inquiry and scientific thinking but encourages the students to cram facts which are always forgotten (Adeyemi, 2008). McDowell (2001) contends that they encourage memorization and reproduction of facts with short notion of knowledge which cannot be used to solve problems in new situations of learning.

Most teachers enjoy teaching the content they are familiar with and teachers usually view themselves as teaching things which are unknown to the learners (Shulman, 2010). Teaching has been based on one-way method where teacher knowledge is central in education (Tsui, 2009). Top-down teaching according to (Freeman, 1989) makes some teachers feel comfortable and safe when they orchestrate the classroom. Thus, teachers need to rethink their roles in an educational context that is constantly changing with more resources and tools, where learners are familiar with using the teaching resources (Lankshear & Knobel, 2011). They are required to be facilitators rather than knowledge providers, while learners are no longer consumers of knowledge (Cummins & Brown, 2007). In their teaching process (Sullivan, Clarke & Clarke, 2013) contend that teachers are reluctant to pose challenging tasks to students and, on the other hand, students seemed to resist engaging with those tasks, and exerted both passive and active pressure on teachers to over-explain tasks or to pose similar ones. Stein and Lane (1996) reported that teachers had an orientation to reducing the cognitive demand tasks. As such, the study endeavoured to determine whether there is a difference between the life skills competencies of students taught RE using CM and those taught using traditional methods.

Facilitative methods (liberative) enhance in a learner other dispositions other pure acquisition of knowledge. According to Groenewegen (1993), facilitative methods develop in the learner ability to explain, pick differences, summarize, interpret and analyze issues and situations. Such methods include:

- Experimental methods which expose a learner to reality. These include; enquiry, survey, self-exploratory, field trips, social action among others.
- Heuristic methods are those methods which allow the learner to search and find things. These are; library search, interview of a resource person and higher order question and answers.
- Concept mapping strategy which involves critical methods such as debate, brainstorming, role play, debate, storytelling, situation analysis, buzz groups, games among others. The use of critical faculties enhances the ability to analyze, make distinctions, identify differences, separate things and put them together.

According to (Ausubel, 1968) the most important single factor that influences' learning is what the learner already knows, therefore, the role of the teacher is to ascertain this and guide the learner accordingly. This therefore suggests that learning is an active process rather than passive process. In other words, learners construct a unique mental image by combining information, in their heads with the information they receive in classrooms or from their sense organs (Otewa, 2016). As far as instruction is concerned the instructor and the learners should engage in active dialogue, such that the presented information to the learner should match the learners' current state of understanding so that the learners continually build upon what they have already learnt. The instructor should acknowledge that learners do not learn in the same way, and so they should implement a variety of teaching styles throughout a lesson for this would give different learners a chance to learn (Otewa, 2016).

2. Concept Mapping as a Teaching Method

Educators looking for new ways to make their teaching engaging, active, and student-centred can use CM to achieve their teaching and learning goals (Beavers, 2014). Such learner centred-methods has been noted (Chika, 2012) to be powerful in enhancing learning achievement. Njoku (2015) avers that RE teachers should make appropriate selection and combination of teaching methods to ensure effective teaching of the subject as a step towards attaining desired life skills among secondary school students. Randall and Cox (2015) agree CM is a teaching approach which is well known among the instructors but is has not been fully implemented within life skills education. Instructors who adopt CM approach value a collaborative approach to teaching and learning, one that honours students' wisdom and contributions towards life skills acquisition (Randall & Cox, 2015). CM enables the instructor to create life skills teaching environment encouraging students to actively engage in and take ownership of their learning experiences. The environment inspires the students to think deeply about how they might apply what they are learning to their daily lives (Randall & Cox, 2015).

For the past decade, there has been a call in education for a shift from teacher-centred methods of instruction to learner-centred pedagogy (Harris & Cullen, 2008). Educators who use a learner-centred approach view learning as a nonlinear, multidimensional and a phenomenon that occurs relationally within a social context (White, 2007). CM shifts the instructor from the centre of the learning environment to a more peripheral position. This shift is achieved by increasing students' opportunities to actively participate in the life skills classroom and engage in self-directed learning outside the classroom, as well as providing forums through which they can share and practice the learnt life skills' information with peers (Wright, 2011). Educators who use CM in teaching life skills favour differential modalities to facilitate life skills acquisition, in contrast to instructors who use traditional methods of teaching that rely on lecture as the primary means of instruction (Wright, 2011). While CMS literature may be well known within the domain of secondary education, as of yet it has not been adequately addressed within the scope of life skills education. Scholars and researchers in life skill education have focused on what content should be included in the curricula (Granello, 2000) or specific teaching techniques used in class (Stinchfield, 2006), rather than comprehensive approaches toward teaching that are helpful for engaging students'

life skills acquisition. As such, this study endeavoured to investigate the effect of CM on secondary school student's acquisition of life skills.

1.1. Purpose of the Study

The purpose of the study was to investigate the effect of CM method on secondary school student's acquisition of life skills through RE. More specifically, the research intended to: determine the difference between life skills acquisition between students taught RE using CM and those taught using traditional methods.

1.2. Research Question

The study research question was:
- What is the difference in life skills acquisition between students taught RE using CM and those taught using the traditional methods?

3. Methodology

The study involved a Quasi-experimental research design using the Solomon Four Non-Equivalent Control Group Design (Gall, Borg & Gall, 2003). The design was preferred because the classes involved in the study remained intact, this was to avoid disrupting the school schedule (Coolican, 1999; Wachanga, 2002). It assesses the plausibility of pre-test sensitization effects, that is, whatever the mere act of taking pre-test influences scores on subsequent test administration (Clark & Elen, 2006). It also ensures that administration of pre-test to two groups and post-test to all four groups (Gall, Borg & Gall, 1996; Wachanga, 2002 & Mwangi, 2007). The independent variable was the CM teaching method while student's acquisition of life skills was the dependent variable with teachers being intervening variables. The design is structurally represented as shown in Figure 1.

Group E_1	Pre-test O_1	Treatment X	Post-test O_2
E_2	-	X	O_5
C_1	O_3	-	O_4
C_2	-	-	O_6

Figure 1: Quasi – Experimental, Pretest- Postest, Non- Randomized Control Group Design

3.1. Sample

The population of the study consisted of all 1850 form four RE students. Purposive sampling was used to select four (4) co- educational schools from the four main administrative units of the study area. A random sample of 169 students was selected for the study. The research instrument developed and used for this study was the RE Students Life Skills Test (RESLST). It consisted of three parts; preliminary information about the respondents, multiple choice questions and defining issue life skills test. The RESLST multiple choice questions and defining issue life skills test were of standard objectives adapted from past question papers of Kenya National Examinations Council (KCSE). The RESLST was used for both pre-test and post- test.

4. Results and Findings

The research question was:
- What is the difference in life skills acquisition between students taught RE using CM and those taught using the traditional methods?

Group	N	Mean	SD	df	t- value	ρ- value
E_1	40	5.61	2.28	81	-.336	.738
C_1	43	5.79	2.52			

Table 1: Showing Comparison of Students' Life Skills Pre- Test Mean Scores by Learning Methods

The results in Table 1 indicate that the students life skills achievement mean score (M= 5.79, SD= 2.52) of C_1 was higher than that of (M= 5.61, SD= 2.28) of E_1. The difference between the two means was howevernot statistically significant at .05 level (t (81) = 4.906, p>. 05). This means that the two groups, C_1 and E_1 were similar before commencement of the study.

Group	N	Mean Max= 24	SD
E_1	40	11.41	3.73
E_2	39	10.59	1.92
E_3	41	8.20	2.89
E_4	44	7.49	2.22

Table 2: Students Life Skills Post- Test Mean Scores and Their Standard Deviations

The mean scores of the experimental groups E_1 (M= 11.41, SD= 3.73) and E_2 (M= 10.59, SD = 1.92) were higher than those of the control groups C_1 (M= 8.20, SD = 2.89) and C_2 (M= 7.49, SD= 2.22).

The results suggest that students exposed to CM perform better than their counterparts taught using traditional teaching approaches. The ANOVA test was conducted to establish whether the difference among the mean sores of E_1, E_2, C_1 and C_2 was significant.

4.1. ANOVA

Scale	Sum of Squares	df	Mean Square	F-ratio	ρ- value
Between groups	436.115	3	145.372	18.950	.000
Within Groups	1227.439	160	7.671		
Total	1663.554	163			

Table 3: Comparison of Life Skills Post-Test Mean Scores by Learning Approach

The ANOVA test results show that the difference in mean scores among the four groups E_1, E_2, C_1 and C_2 was statistically significant at the .05 level in favour of the experimental groups, $F(3, 160)= 18.950$, $p<.05$. The results of ANOVA test only show differences among a group of more than three variables, it does not reveal where the differences are. Therefore, there was need to conduct further analysis to reveal where the differences were. The Least Significant Difference (LSD) test was conducted to reveal where the differences were.

Paired Group	Mean Difference	p- value
E_1 versus E_2	0.82	.190
E_1 versus C_1	3.21	.000*
E_1 versus C_2	3.92	.000*
E_2 versus C_1	2.39	.000*
E_2 versus C_2	3.10	.000*
C_1 versus C_2	0.70	.243

Table 4: LSD Multiple Comparison of Life Skills Post- Test Mean Scores by Learning Approach
*Significant at .05 Level

The multiple comparison results reveal that there were significant differences between pair groups E1-C1 (p<.05), E1-C2 (p<.05), E2-C1 (p<.05) and E2-C2 (p<.05). However the differences between E1-E2 (p >.05) and C1-C2 (p >.05) were not statistically significant. Generally, the experimental groups outperformed the control groups. Further analysis was conducted by comparing the mean scores of the control (C1 and C2 combined) and experimental (E1 and E2 combined) groups using the t-test to confirm the results of the ANOVA test. The comparison was conducted using the t-test.

Group	N	Mean	SD	df	t-value	ρ-value
Experimental	79	11.00	2.99	162	7.306	.000*
Control	85	7.83	2.57			

Table 5: Showing Comparison of the Students' Life Skills Post- Test Mean Scores Between the Experimental   and Control Groups

The test results reveal that the mean (M =11.00, SD = 2.99) of the experimental group was higher than that (M =7.83, SD = 2.57) of the control group. The results further reveal that the difference between the means of the two groups was statistically significant at the .05 level, in favour of the experimental group (t(162) = 9.306, p<.05).

4.2. Gain Analysis - Groups C1 and E1

Gain analysis examines the achievement levels of E1 and C1 before and after the programme and tries to explain improvements in learning outcomes as measured by the mean scores.

Stage	Scale	Group	
		E1 n = 40	C1 n = 43
Pre-test	Mean	5.61	5.79
	Standard Deviation	2.28	2.52
Post -test	Mean	11.41	8.20
	Standard Deviation	3.73	2.89
	Mean Gain	5.80	2.41

Table 6: Students' Pre- test and Post- test mean Scores, Standard Deviations and Mean Gains by Learning Approach

The pre-test life skill mean (M =5.61, SD = 2.28) of E1 and that (M = 5.79, SD = 2.52) of C1 were comparable before the commencement of the programme. After the treatment, the mean (M = 11.41, SD = 3.73) of E1 was higher than that (M = 8.20, SD = 2.89) of C1. The result also reveals that the mean gain of E1 (M =5.80) was higher that (M = 2.41). This means that improvement in learning outcomes of the experimental group E1 was higher than that of the control group C1.
The t-test was used to establish whether the two mean gains were statistically significant as presented in Table 7.

Group	N	Mean Gain	SD	df	t-value	ρ-value
E1	40	5.80	3.15	79	4.104	.000*
C1	41	2.54	3.95			

Table 7: Difference in Mean Gain on Life Skills Test between $E_{1\ and}\ C_2$
*Significant at .05

The t-test results show that the difference between the mean gains of E1 (M = 5.80, SD = 3.15) and C1 (M =2.54, SD 3.95) was statistically significant at the .05 level, in favour of the experimental group (t (91) = 7.606, p<.05). The experimental group thus had a higher improvement in learning outcomes as measures by the mean gain. That high improvement in the experimental group is attributed to the treatment. The results of life skill post-test analysis revealed that the difference among the means scores of groups C1, E1, C2 and E2 were statistically significant in favour of the experimental groups. On the basis of these results, the research hypothesis which stated that the difference between the life skills of students taught using CM is not statistically different from those taught using traditional strategies was rejected.

5. Discussion of Results

As revealed by the mean scores between the experimental groups and their SD, concept mapping strategy of teaching improves the students' acquisition of life skills. This was in agreement with the findings of studies by (Ilori, 2001; Njoku, 2015) that effective use of learner-centred teaching approaches helps in attaining religious education learning outcomes among secondary school students. Ilori (2001) emphasized the need for RE teachers to always pay attention to the teaching approaches that caters for the needs of the students as a factor in attaining RE learning outcomes. Concept mapping strategy presupposes that students learn faster through experience. When students are exposed to making their own findings, (Njoku, 2015) contend that they gain knowledge faster, and as such knowledge is usually permanent.

The findings of this study, further, synchronized with the submission of Nelson (2002) that constructive approach to teaching yields positive attainment of desired learning outcomes. CM therefore supports the adage that says experience is the best teacher hence life skills knowledge can best be achieved from learners' experience. CM appeals to the students' conscience on the need to learn. This agrees with Njoku (2012) that effective use of teaching strategies helps the teacher to develop ethical and responsible students by encouraging them to acquire life skills required to operate in the society. CM not only exposes the students on the need to be diligent with their study but also help teachers to advocate for conducive environment that would enable effective learning to take place.

The results of this study complement the observation of Obanya (2004) that learner-centred teaching approach builds in the student good attitude, respect for others; and the aura to appreciate the society and to interact properly with the teacher thereby turning the class into a better learning environment. RE being an abstract subject could be discussed and understood better if the students are given the opportunity to share ideas and different views on conflicting issues. Furthermore, constructive teaching methods according to Njoku (2002) increases students' self – esteem, motivation and empathy.

Contrary to the findings of this study, the report of a study by Dinama (2013) showed that teachers are aware that they need a strong pedagogical and content knowledge in the teaching of religious education but they hardly practice the same. The study recommends the need for teachers to be professionally, culturally and religiously competent in religious education classrooms in order to deal with differences an effective and constructive way. Njoku (2013) supports this argument because students could be different in terms of who are hyperactive, socially inhibitive or those who are average academically relative to their classmates. However, the environment in most of religious education classrooms privilege the teachers' knowledge over those of students rather than emphasize the extent to which students are enabled to become independent learners who are empowered.

6. Conclusion and Recommendation

In conclusion, if teachers of RE effectively make use of CM while teaching, they would increase the students' life skills competency, thereby attaining the desired objectives. Effective application of CM would in addition provide opportunities for the learners' interpersonal and personal life skills development. It would also imbue the learners with the experiences that would warrant future success as in any endeavour of their life. Imperatively appropriate application of CM as a teaching method is a key factor in attaining RE learning outcomes among secondary school students in Ndhiwa Sub- County, Kenya.

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