The Effect of Using Hendy's 4Cs Model on Acquiring some Vocational Concepts and Social Skills for Primary School Students

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Abstract: It is known that most of learning theories recommended developing the whole personality of learner in all school levels. Integrating among applications and recommendations of several learning theories can create better and effective varied learning environments for all learners. So educators should continue to develop learning and teaching models based on learning theories to help engage learners and develop their achievement, attitudes, interests, skills, multiple intelligences...etc. Accordingly, the main purpose of this study was to identify the effect of using Hendy's 4Cs Model on acquiring some vocational concepts and social skills for primary school learners in Mid- Egypt. Hendy's 4Cs Model is based on four learning theories; contextualism, connectivism, constructivism, and cognitivism. So it took its name (4Cs Model) to include 4 phases; contextualizing, connecting, constructing, and cognitivizing; with several roles of teacher and learners through each phase of the model. To investigate the main purpose of this study, tow research statistical hypotheses were set regarding two dependent variables; vocational concepts and social skills. Research treatment materials and instruments were developed and controlled to be administered with a random sample of primary fifth grade students in Beni-Suef city, Mid Egypt according to the quasi-experimental research design. The data were collected and analyzed using SPSS techniques, then interpreted and presented through the study. The results referred that Hendy's 4Cs model has an effect on acquiring vocational concepts and social skills for the study sample. Based on those results, some recommendations were presented at the end of this study.

Keywords: Hendy's 4Cs Model, Vocational concepts, Social skills, Primary students' learning

Introduction

Primary education in Egypt, like several countries, represents an important part of basic education that includes primary and middle stages. It is planned and organized to help students accept the basics of natural, social, and vocational sciences that help them live safely in their communities. So primary education subjects and methods of teaching them should be reviewed and examined from time to time based on recommendations of learning theories that have interpreted learning process. This study has adopted Hendy's 4Cs model that based on four learning theories; contextualism, connectivism, constructivism, and cognitivism. So the model was designed to include 4 phases; contextualizing, connecting, constructing, and cognitivizing to take the learner through a mental practical trip from observing and examining real materials to meaningful learning and long-term memory (Hendy, 2016). Regarding the theories on which the model is based, contextualism is a learning theory that focuses on learning from multiple real aspects of any learning environment whether in a classroom, a laboratory, or a workplace (TEXAS, 2016). The learning theory of connectivism has been developed as a result of a belief that there is a need for a learning theory that takes into account the manner in which society has changed as a result of the digital age (Siemens, 2004). So it seeks to assist in development of current practice in order that learning design will be developed based on digital means in the future (Al-Shehri, 2011). Constructivism is a learning theory that interprets learning as a process of constructing knowledge through experiencing things and using previous knowledge. Cognitivism is a learning theory that was emerged to explore what happens inside our minds while we learn. Cognitivists presented two essential dimensions explaining the occurrence of learning; the first is concerned with information processing; in terms of receiving, storing, and then remembering information when it is needed. The second is concerned with the meaningful learning; in terms of how the learner forms and organizes existing and new information coming to his mind (Cruikshank and Others, 2006) (Hendy' 2017a).

Included in those four phases, there are several roles that teacher and learners can practice together. According to those multiple roles through the model's phases, it can be functionalized to teach and learn any subject in any school level. Vocational concepts and social skills are very important educational aspects that should be actively taught and learned using new models of teaching and learning like Hendy's 4Cs model.

Statement of the Problem

Although both vocational and social aspects of education are very important for students in all school levels, they are still presented to primary students according to the traditional theoretical method of teaching. Maybe this traditional method is suitable partially for some topics but not suitable for presenting several educational aspects needed for real life. Accordingly the current study tried to examine the effect of a new model for teaching and learning (Hendy's 4Cs Model) on acquiring some vocational concepts and social skills for primary students.

Theoretical Background and Previous Literature

Hendy's 4Cs Model

Based on the four learning theories of contextualism, connectivism, constructivism, and cognitivism, Hendy's 4Cs model was designed to be in four learning phases as follows (Figure 1) (Hendy, 2016, Hendy, 2017a) :
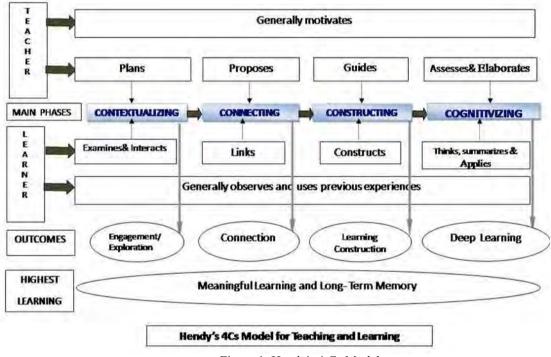

Figure 1. Hendy's 4 Cs Model

Contextualizing

Contextual learning means that students learn in real situations or in places close to be real situations. Hasani (2016) explained that it helps students comprehend lessons, create new ideas, and make a link between academic subject and real world concepts. Nurhadi (2002; cite in Hassani, 2016) stated that there are several principles behind contextual learning; such as: inquiry, questioning, modeling, reflecting, and authentic assessment. Sudarman and Sutopo (2017) found that contextual learning had a strong effect on learning of a course on conservation for mechanical engendering students in Indonesia. Hasani, (2016) found that a contextual learning model accompanied with critical thinking abilities had significant influence toward argumentative writing skills. As shown in Hendy's 4Cs model, there are many roles of teacher and students that can be practiced to attain real learning through this face.

Although the contextual learning through this phase can establish varied real life-contexts and stimulate thinking on real materials and events, there are some limitations for contextual learning. For instance, contextual learning tasks mostly address the visual learning style while learners have multiple learning styles such as verbal, auditory, creative and so on; which need to be considered during learning. Also there is a difficulty of

identifying the actual learning level that can be acquired completely through the contextual situation. Hereby, learners need to connect their learning to other situations and events verbally, virtually, and technologically (Hendy, 2017 a).

Connecting

Once the learning tasks are being acquainted by students through the previous phase, learners can be guided to connect what they have actually observed to other contexts technologically according to connectivism theory (Hendy, 2017a; Hendy, 2017b). Connectivism is a learning theory developed by George Simmens. The theory views knowledge as a network state and learning as the process of generation of network and adding and maintaining connections (Siemens, 2013). The concept of network can be attained through investing all learning resources around learners.

According to Siemens (2005) the principles behind connectivism are: learning depends on a diversity of opinions, learning is a process of connecting information sources, the ability to learn is more important than what is known, and it is necessary to nourish and maintain connections to facilitate continuous learning. So connectivism can be understood as an approach to learning that places the importance of networks and connections at the forefront (Weller, 2011). Learning occurs when participants connect information in learning community. Kop& Hill (2008) explained that within connective learning situation, the most important skills for learning are represented in searching for information and the ability to filter out secondary information. Dirks& Prenger (1997) found that educators realized that connecting instructional content to specific contexts of learners' lives increased motivation to learn.

Although the importance of connective learning, several criticizes presented to connectivism; it does not address how learning take place; connectivism principles lack rigor and are not written in such way that can be tested (Verhagen, (2006). Clara and Barbera (2014) explained that it does not present a solution for a learning paradox and does not explain concept development. So students need to construct knowledge by themselves (Hendy, 2017).

Constructing

This phase depends on the theory of constructivism that was initially supported by several philosophers like Dewey and Piaget. Dewey (1916) explained that new education should be active and constructive. Piaget (1952) stated that human mind creates schemes by what the learners intellectually adapt to in the environment. Piaget& Inhelder (1969) also explained that internal factors can provide the individuals with capability and motivation to promote learning. Alsulami (2016) explained that implementations of constructivist pedagogy share several features of effective learning such as: learning is a learner-centered, learning manipulates the group interaction, and learning depends on the learners themselves and their prior knowledge. This tells the instructor where the start point of the topic. The opportunities of participating in the class help learners to share their information with others and enhance the self-confidence. Arseven (2015) explored that using a mathematical teaching program based on a constructive approach was very necessary to motivate students, eliminate their anxiety and allow them develop positive attitudes towards mathematics (Hendy, 2017 a). Based on personal observations, it was noticed that learners need to do something after constructing knowledge, either individually or cooperatively, through learning situations. So, many learners are in need to process information cognitively more and more through the coming phase.

Cognitivizing

This phase depends on cognitivism theory that explains there is an internal cognitive structure which is named Schema by which the coming new information can be compared with the information already exists. This internal cognitive structure can be extended or changed to adapt the new information received (Kathleen, 2004), (Hendy, 2017). Cognitive processes and activities such as processing information, mental representations, guesses and expectations are accepted to be a basis in the interpretation of learning. What cognitive learning does in addition to behavioral learning is that it claim cognitive processes are also present in the events of an organisms' learning (Cellkoz, Erisen and Sahin,2019).

Generally, the success of Hendy's 4cs model depends on roles of both of teacher and learners. Through the whole model the teacher has the responsibility of motivating and using effective feedback, and learners have the responsibility of observing and using previous knowledge and experiences. Moreover there are multiple roles of both of them through each phase as shown in figure 1. Based on those roles, it is expected that there is increasing in the level of academic achievement, skills, attitudes, learning styles, multiple intelligences of learners. Moreover, there are direct processes can be completed in the part of learners as a result of practicing the model phases. Practicing the contextualizing phase effectively can result in engagement of learners and exploration of main ideas behind the contextual situations. In connecting phase, the result would be an effective connection of learning; that help enhance the main ideas and experiences for learners. In the third phase of constructing, the natural benefit is the constructing of knowledge based on what practiced in previous phases and on previous personal knowledge. In cognitivizing phase, deep understanding and learning can be attained as a result of deep processing of information, summarizing, reflecting, and making decisions on learning (Hendy, 2016).

In addition, the highest level of learning would be appeared in meaningful and long term memory. Grabe& Grabe (2000) explained that meaningful learning occurs when new experiences are related to what a learner already knows. According to Ausubel, meaningful learning may be explained as a process of relating and connecting new material to old ones as a hierarchical fashion (Moghaddam& Araghi (2013). Also, paying attention, using real contexts, repetition, rehearsal strategies, using previous knowledge, and reflecting on self-constructed knowledge through this model, information can be placed in long-term memory (Hendy, 2016). Practically, a study conducted by Hendy (2016) found that the model was effective in developing some multiple intelligences, scientific concepts, and life skills to middle school students in Mid-Egypt. Another Hendy's study (2017a) found that Egyptian middle school teachers perceived the model as effective towards engaging middle school students intellectually, behaviorally, emotionally, and cognitively. Hendy's study (2017b) explored that Hendy's 4Cs Model was effective in respect to engaging college students socially and emotionally. Hendy,s study (2018) explored that teachers who work in secondary schools of big numbers of students with learning disabilities perceived using Hendy's 4Cs model as an effective model to engage learning-disabled students behaviorally and cognitively. Adel (2018) study found that Hendy's 4Cs model was effective regarding learning Arabic language for middle school students.

Hendy's 4Cs Model and Acquiring Vocational Concepts and Social Skills

In Egypt, it is often said that primary school students accept social aspect of education theoretically and vocational aspect practically. Indeed, social aspect is done theoretically and vocational aspect is relatively done practically. Because social skills are essential and needed for primary students to help them interact more each to other inside and out of school, this study tried to focus on social skills beside vocational concepts. But how they are given to students in effective ways; this depends on renewing those aspects and adopting the effective teaching and learning models that depend on both of teacher and students.

Regarding vocational concepts, educators always believe in vocational education as an important aspect to prepare students for practical projects and community vocations, and always give their recommendations to develop and deliver it in productive ways. Idialu (2013) stated that vocational education is a type of educational training or retraining that focuses on making the learner more productive through performance in employment. Idialu stressed that in order to ensure high quality in the teaching, examination and improved learning in vocational education, it is essential that the learner has opportunities to learn from teachers who are qualified to teach them (Idialu, 2007) through using effective teaching and Learning models.

In respect to social skills, Marlowe (1986) described them as the skills of an individual to understand the emotions, and behaviors of people, including the individual himself in interpersonal situations, and the ability to behave in accordance with this understanding. They represent the ability of an individual to demonstrate behaviors in a social environment that may be useful for the individual and others (Ozbey & Koycegiz, 2019). Social skills play a vital role in the development of a student's ability to communicate with other people, to involve knowing how to act in a certain social situation, to improve and maintain meaningful social and emotional relationships with others (Merrell & Gimpel, 2014; in Mpella, Evaggelinou &Tsigilis, 2019).

According to the nature of both of vocational concepts and social skills, and their need to be learned actively, Hendy's 4Cs model can be a very suitable technique to help acquiring those concepts and skills. It offers opportunities for learners to observe, examine, interact, connect, process, and apply knowledge and skills under the supervision of teacher. The model is based on actual learning theories that have evidences towards attaining

effective learning in several subjects; it is like an integrated mental practical journey that takes the learner from a contextual concrete situation to a full cognitive learning environment, and result in meaningful learning and long-term memory. But to attain an effective contextual, connective, constructive and cognitive trip through this model, the teacher should accept changes in her/his roles, and also changes in learning environment (Hendy, 2016).

Purpose and Objectives/Hypotheses

The main purpose of this study was to identify the effect of using Hendy's 4Cs model on acquiring some vocational concepts and social skills for primary school students in Mid-Egypt. Taking the details of this purpose in account, two research hypotheses were set as follow:

> 1-There is a statistical significant difference between the mean scores of the post-test of the experimental group and the mean scores of the post-test of the control group regarding the test of vocational concepts.
> 2-There is a statistical significant difference between the mean scores of the post-test of the experimental group and the mean scores of the post-test of the control group regarding the scale of social skills.

Methodology

The target population of this study was the primary school students in Mid-Egypt. The research sample consisted of 64 fifth grade students enrolled in a middle school in Beni-Suef City, Mid-Egypt, through the academic year of 2019. The sample was divided into two groups; the experimental group was 32 students, and the control group was 32 students. Based on the study purpose, two instruments (achievement test and social skills scale) were developed and controlled. The achievement test consisted of 20 multiple choice questions regarding vocational concepts like agriculture, agricultural education, agribusiness, crops, agricultural marketing, agricultural extension, vegetables, fruits,… etc. that are related to vocational and scientific topics taught for primary fifth grade students. The second instrument was the social skills scale consisted of 22 items that addressed students' social skills like cooperation, team work, decision making, communication, making relationships…etc. Content and face validity of the instruments were determined by a panel of experts specialized in science, vocational, and social education. The reliability coefficient was calculated for the two instruments using Cronbach's alpha. It was 0.81 for the achievement test, 0.86 for the scale of social skills. The study adopted the quasi-experimental design (two equivalent groups; experimental and control group). After conducting the experimental treatment and administering the research instruments as post-tests with the two groups, data was analyzed using Statistical Package for Social Sciences (SPSS) to examine the research hypotheses.

Results

Hypothesis 1: There is a statistical significant difference between the mean scores of the post-test of the experimental group and the mean scores of the post-test of the control group regarding the achievement test of vocational concepts. The hypothesis was tested using independent t test at $p < 0.05$.

It is shown in Table 1 that t value is (3.08) which revealed that there is a statistical significant difference between the mean scores of the post-test of the experimental group and the mean scores of the post test of the control group in favor of the experimental group.

Table 1. Means, Standard Deviations, and t Value Regarding Research Sample Responses on the Achievement Test

Test	Group	N	SD	M	t	Sig.
Achievement test	Experimental group	32	1.6	17	3.08	<0.001
	Control group	32	0.9	12		

Hypothesis 2: There is a statistical significant difference between the mean scores of the post-test of the experimental group and the mean scores of the post-test of the control group regarding the scale of social skills. The hypothesis was tested using the independent T test at $p < 0.05$.

It is shown in Table 2 that t value is (5.04) which revealed that there is a statistical significant difference between the mean scores of the post-test of the experimental group and the mean scores of the post-test of the control group in favor of the experimental group.

Table 2. Means, Standard Deviations, and t Value Regarding Research Sample Responses on the Social Skills Scale

Test	Group	N	SD	M	t	Sig.
Social Skills	Experimental group	32	2.5	47	5.04	<0.001
Scale	Control group	32	1.9	31		

Discussion, Conclusion and Recommendations

Based on the above results, the study has found that primary fifth grade students acquired vocational concepts and social skills as a result of studying some vocational and scientific topics according to Hendy's 4Cs model. These results came to support the previous studies used Hendy's 4Cs Model. Hendy's study (2016) explored that Hendy's 4Cs was effective to help middle school students acquire some scientific concepts, life skills, and multiple intelligences. Hendy's study (2017a) found that Egyptian middle school teachers perceived the model as effective towards engaging middle school students intellectually, behaviorally, emotionally, and cognitively. Hendy's study (2017b) also explored that the model was effective in respect to engaging college students socially and emotionally. Hendy's study (2018) explored teachers who work in secondary schools of big numbers of students with learning disabilities perceived using Hendy's 4Cs model as an effective model to engage learning-disabled students behaviorally and cognitively. Adel (2018) study found that Hendy;s 4Cs model was effective regarding learning Arabic language for middle school students in Mid-Egypt.

In conclusion, it can be said that the effectiveness of Hendy's 4Cs Model regarding the previous studies and current study has come as a result of the logical sequence of the model main phases, the varied procedures through the model phases, and the multiple roles of both of teacher and learners through the whole learning process by this model. According to the above results, discussion, and conclusions, the current study recommends:

- All teachers in all school levels should be trained on -or at least should be acquainted with- how to use modern models based on real and effective learning theories.
- Future research studies should be conducted regarding other subject areas and other dependent variables with the use of Hendy's 4Cs Model.

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