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PERCEIVED COMPETENCE OF CONSTRUCTIVIST INSTRUCTIONAL SKILLS AMONG SECONDARY SCHOOL TEACHERS OF KERALA

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Abstract

This article aims to throw more light into the area of instructional design in terms of the epistemology of Constructivism. Constructivist instructional design aims to provide generative mental construction "tool kits" (Jonassen, 1991) embedded in relevant learning environments that facilitate knowledge construction by learners. Compared to traditional instructional systems approaches of designing instruction, constructivism makes a different set of assumptions about learning and suggests new instructional principles. However, design practices do not merely accommodate constructivist perspectives. The implications of constructivism for instructionaldesign is revolutionary as they replace rather than add to our current understanding of learning (Bednar et al., 1992). Instructional designers are thus challenged to translate the philosophy of constructivism into actual practice. This paper proposes a constructivist approach to help develop teachers CIS through a combination of practice and the knowledge about constructivist instructional design. By investigating the nature of CLD and contemporary methods of teaching and learning, an instructional framework is proposed to help prepare teachers for workplace by promoting CIS development as well as subject specific knowledge.

A research question and three hypotheses were raised for the descriptive survey study, and the findings are Most teachers in Kerala State secondary schools do not have the required competence in CIS, those teachers in the Arts have more competence in CIS than teachers in the sciences. Academic qualification of a teacher does not have any effect on teacher's competence in CIS and Teachers' competence in the use of CIS is not influenced by their teaching experience.

Keywords: *Constructivist Approach, Constructivist Learning Design (CLD), Constructivist Instructional Skills(CIS), Competence.*

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Introduction

In an ever-changing society of the 21st century, there is a demand to equip students with meta competences going beyond cognitive knowledge. Education, therefore, needs a transition from transferring knowledge to developing individual potentials with the help of constructivist learning. Advantages of constructivist learning, and criteria for its realisation have been well-determined through theoretical findings in pedagogy (Reich 2008, de Corte, OECD 2010). However, the practical implementation leaves a lot to be desired (Gardner 2010, Wagner 2011). Knowledge acquisition is still fragmented into isolated subjects. Lesson layouts are not efficiently designed to help teachers execute a holistic and interdisciplinary learning. Learning is a process of understanding, which leads to modifications in the behaviour of the learner (Hasselhorn and Gold 2006). The present pattern of instruction following in Kerala is based on constructivist approach as recommended by National curriculum frame work (NCF,2005) and Kerala curriculum frame work (KCF,2007). According to KCF (2007), the process of education must instil in learners, the ability to construct knowledge through interaction and sharing, according to constructivist theory, this is achieved through experience. The teacher as a facilitator of learning should consequently be able to design learning experiences. So, what is needed for constructivist learning design?). As participation and engagement of the student is a crucial characteristic of constructivist learning (Reich 2008), the teacher needs to involve the student in the learning design, e.g. to look at the students interests in order to propose a problem statement or project challenge. Even more so, they need space to try out different mental models and methods to connect abstract knowledge with concrete applications and thereby, being able to convert and apply abstract and general principles (acquired through instruction) in meaningful and responsible acting in life (acquired through construction).

Yusuf (2005) asserts that teachers' competence is of particular concern when new subjects or media are introduced into the school system. This is because teachers' experience and competence will form the foundation of their ability to implement the innovation in schools.

- UNESCO (2005) defines competency as a set of attributes covering knowledge, skills and attitudes for enabling one to effectively perform the activities of a given occupation or function to the standards expected in employment. Some authors refer to Chomsky (1968) as the originator of the term competence.
- "Competency is a knowledge, skill, ability, or characteristic associated with high performance on a job, such as problem solving, analytical thinking, or

leadership. Some definitions of a competency include motives, beliefs and values." (Mirabile, 1997, p. 75)

The concept of constructivist learning

Constructivist learning arose from Piagetian and Vygotskian perspectives (Palincsar, 1998), emphasising the impact of constructed knowledge on the individual's active, reflective thinking. While Piaget focused more on individual cognitive constructivism, Vygotsky stressed that sociocultural systems have a major impact on an individual's learning (Stegler, 1998). According to social constructivist theory, knowledge is socially situated and is constructed through reflection on one's own thoughts and experiences, as well as other learners' ideas. Dewey (1938) believed that individual development is dependent upon the existing social environmental context and argued that students should learn from the genuine world through continuous interaction with others. Lave and Wenger (1991) asserted that learning is socially situated with members' active participation in their routine, patterned activities. A constructivist, dialogical instructional approach should focus on learning about 'why' and learning about 'how', rather than conducting learning itself (Scott, 2001). In the constructivist learning environment, students are encouraged to actively engage in learning: to discuss, argue, negotiate ideas, and to collaboratively solve problems; teachers design and provide the learning context and facilitate learning activities (Palincsar). Because of their rich life and employment experience, the social, situated nature of learning through practices appears particularly authentic and appropriate for adult learners.

Constructivist Instructional Design

Learning is a process of understanding, which leads to modifications in the behaviour of the learner (Hasselhornand Gold 2006). According to constructivist theory, this is achieved through experience. The teacher as a facilitator of learning should consequently be able to design learning experiences. So, what is needed for constructivist learning design? In his concept of CSSC learning, Erik de Cortepoints out four main criteria for competence-oriented learning: to be constructed, situated in context, self-regulated by the learner and collaborative (de Corte 2010). The following three aspects are essential for a convenient constructive learning design:

- involvement of students;
- experience space;
- balance of instruction and construction.

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In sum, a good lesson design needs to be a balanced composition of instruction and construction, or as Dewey would say "construction through instruction" (Dewey 1913, Knoll 1993). A lesson design should answer, *how* students can experience certain situations, and how teacher can enable this experience. A good learning design is to what schools mostly fail until today. The *How*, e.g. the instruction to execute constructivist learning is either too open (free construction only) or too detailed (instruction only).

Constructivist learning design was developed by George W. Gagnon, Jr., and Michelle Collay (2006) to encourage teachers focus on thinking about learner behaviours it helps the teacher organise what learners will do rather than plan teaching behaviours.In this model, teachers implement a number of Skills in their teaching structure. They:

1. **Situation**: develop a **situation** for students to explain. Title and describe the situation to describe as a process of solving problems, answering questions creating metaphors, make decision, drawing conclusions, or setting goals.
   - What does the teacher expect the students to do?
   - How will students make their own meaning?
2. **Groupings**: select a process for **groupings** of materials and students.
   - grouping of students as either whole class, individuals, or in collaborative learning teams two, three, for more.
   - Grouping of materials that students are going to need to explain the situation by physically modelling, graphically representing, numerically describing, or reflectively writing their individual and collective experiences.
3. **Bridge**: build a **bridge** between what students already know and what the teachers want them to learn. Bridge can be formed through the following activities
   - Solving a simple problem.
   - Having a group discussion.
   - Playing a game or simulation.
   - Brainstorming on a topic.
4. **Questions**: questions are used to introduce the situation and to keep thinking going, anticipate **questions** to ask and answer without giving away an explanation. The following matters are to be noted by the teacher while framing questions.

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- What question will set up a bridge to the situation?
- What questions will set up a bridge to the situation for students to explain?
- What questions are to be framed for students to ask, and how will the teacher respond to encourage them to continue thinking for themselves?

5. **Exhibit**: students exhibit before others what they have done and how they recorded their explanations. encourage students to **exhibit** a record of their thinking by sharing it with others.

- Write a description on cards and give a verbal presentation.
- Draw out a graph, a chart, or a visual representation.
- Act out or role play their impressions.
- Construct a physical representation with models.
- Videotape, photographs, or audio tape for display.

6. **Reflections:** students give an account on what they were thinking while explaining the situation. Teacher asks students to reflects on the following matters. solicit students' **reflections** about their learning.

- Image in their imagination; and
- Languages in their internal dialogue.
- Attitudes, skills, and concepts students learned.
- Relevance of the model in the present study.
- Feeling in their accept.

Constructivist learning design can be adopted to any subject area or curriculum by involving students as active participants in making meaning instead of passive recipients of information given to them by the teachers. This can be incorporated into 45- or 50-minute class periods to teach a particular concept, skill, or attitude.

Objective of the Study

In spite of the recognized potentials of CIS, their integration into learning process will be dependent on teachers' competence in their use. This study attempted a value judgement of teachers' perceived competence in CIS with respect to Constructivist instructional method.

1. To find out the perception of secondary school teachers on their existing level of the application of Constructivist Approach in their teaching.
2. To find out the existing level of Constructivist Instructional Skills of secondary school teachers.

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1. To compare the perception of secondary schoolteachers on their existing level of application of constructivist approach in their teaching with respect to subsamples based on Educational qualification: Graduate/Post graduate;
   - Subject: Arts/Science
   - Teaching experience: Experienced/Less experienced

Research Question

(i) What is the perceived competence of secondary school teachers in the use of CIS?

Research Hypotheses

Ho1: There is no significant difference in the perceived competence of science teachers and teachers in humanities in the use of CIS.

Ho2: There is no significant difference in the perceived competence of graduate and non-graduate teachers in the use of CIS.

Ho3: There is no significant difference in the perceived competence of experienced and less experienced teachers in the use of CIS.

Methods

Design

This research is a descriptive research of the survey type. Questionnaire was used to ascertain the perceived competence of secondary school teachers in the use of CIS.

Sample and Sampling Technique

The population for this study consisted of all the teachers in the public secondary schools in Kerala. The study covered secondary school teachers in the four districts of Kerala State namely: Thiruvananthapuram, Ernakulam, Kasaragod, Wayanad Simple random sampling technique was used to select 5 schools in each of the zones and 15 teachers from each of the schools which gave a total of 300 respondents for the study.

Instruments

The research instrument used for this study was an CIS Competency Questionnaire (CISCQ). This instrument was designed by the researchers. The questionnaire is divided into two sections. Section A seeks for demographic data of each respondent. Section B consists of sub-sections 1-3 that has a total of 30 items divided into: (a) perceived competence in constructivist approach(CA); (b) perceived competence in constructivist learning design(CLD); (c) perceived competence in using constructivist instructional skills(CIS); and with the response format of High Competence, Average Competence, Low Competence and Incompetence.

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Method of Data Collection

Research assistants were engaged by the researchers in the administration of the instrument. The principal of each school was met for permission to administer the instrument before proceeding to the staff rooms to meet the teachers. The copies of the questionnaire were administered and collected the same day.

Method of Data Analysis

The collected data from the administered instrument were coded and analysed using frequency and simple percentage. Chi square was used to test the hypotheses at 0.05 alpha level and only 282 questionnaires were valid for the data analysis.

Results

Research Question

What is the perceived competence of secondary school teachers in the use of CIS?

To answer this question, teachers were asked to identify their perceived competence in various Skills and Subskills relating to CIS, use of Teaching and Learning. The results are presented in Table 1.

Table 1: Summary of Teachers Perceived Competence in CIS.

Items	High Competence	%	Average Competence	%	Low Competence	%	Incompetence	%
Constructivist Approach	21	7.47	63	22.23	100	35.43	98	34.95
CID	24	8.43	39	13.83	85	30.10	134	47.66
CI skills	26	9.03	70	24.88	77	27.37	109	38.71
Mean	24	8.30	57	20.31	87	30.96	114	40.44

In Table 1, 21(7.47%) of the teachers who took part in the survey indicated high competence in CS Approach, 63(22.23%) indicated average competence, 100(35.43%) indicated low competence while 98(34.95%) indicated incompetence. In the use of Constructivist instructional strategies 24(8.41%) indicated high competence 39(13.83%) indicated average competence. Furthermore, 85(30.10%) indicated low competence and 134(47.66%) indicated incompetence. The data on teachers' use of constructivist instructional skill shows that 26(9.03%) indicated high competence and 70(24.88%) indicated average competence. Also 77(27.37%) indicated low competence and 109(38.71%) indicated incompetence.

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Test of Hypotheses

Hypothesis 1

There is no significant difference in the perceived competence of science teachers and teachers in Arts in the use of CIS.

Table 2: Chi Square Analysis of Perceived Competence of Science Teachers and Teachers in Arts in the Use of CIS.

Subject specialization	High Competence	Average Competence	Low Competence	No Competence	N	df	X2 Cal	X2 cri
Science	52	17	28	81	282	3	8.403	7.815
Arts	22	28	93	90				

Decision

Since X2 Cal 8.403 is greater than X2 cri 7.815, the null hypothesis was rejected. Thus, there was no significant difference in CIS competence of teachers in the sciences and those in the arts

Hypothesis 2

There is no significant difference in the perceived competence of graduate and non-graduate teachers in the use of CIS.

Table 3: Chi Square Analysis of Perceived Competence of Graduate and Post-graduate Teachers in the use of CIS.

Educational Qualification	High Competence	Average Competence	Low Competence	In Competence	N	df	X2 Cal	X2 cri
Graduate	11	30	77	65	282	3	2.976	7.815
Post Graduate	5	17	33	46				

Decision

Since X2 cal 2.876 is less than the X2 cri 7.815 the null hypothesis was not rejected. Thus, there was no significant difference in the CIS competence of graduate and non-graduate teachers.

Hypothesis 3

There will be no significant difference in the perceived competence experienced and less experienced teachers in the use of CIS.

Table 4: Chi Square Analysis of Perceived Competence of Experienced and Less Experienced Teachers in the use of CIS

Teaching Experience	High Competence	Average Competence	Low Competence	In Competence	N	df	X2 Cal	X2 Cri
Experienced	15	34	63	59	282	3	4.191	7.815
Less Experienced	14	16	33	48				

Decision

Since the X2 cal 4.456 is less that the X2 cri 7.815, the *null hypothesis was* accepted. Thus, there was no significant difference in the CIS competence of Experienced and Less-experienced teachers.

Discussion

Research question shows in Table 1 that just 8.30% of the teachers have high competence in CIS, 20.31% have an average competence, 30.96% have low competence and 40.44% are incompetent in CIS. These figures indicate that majority of teachers in the secondary schools do not have the required competence in the use of CIS. For most teachers, their knowledge of constructivism is limited to the saying "students construct their own knowledge" (Cobb, 1994, p. 4).The vast majority of teachers do not know how to manage teaching and learning in the method of constructivist approach to promote learning by doing, and they are not adequately trained to use constructivist instructional strategy. It also confirms the assertion that teachers have not developed competence in the use of CIS. Similarly , The first hypothesis shows that there is a significant difference in the CIS competence of teachers in the sciences and arts with teachers in the arts scoring higher than science teachers. This finding is in consonance with the findings of Ohidipe (2004) that there exists a low level of acquaintances with many Constructivist strategies among science teachers.

The results of this study also show that CIS competence of secondary school teachers is not academic qualification specific as confirmed through hypothesis. The idea that our beliefs about teaching and learning affect our classroom practice, as well as our ability to change our practice, is expressed by Lester and Onore (1990). Support for this idea comes from Kelly's (1991) personal construct theory which states that attitude of teachers towards the acquisition of constructivist instructional skills and usage depreciate as they attain high academic qualifications. The outcome of this study makes

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is evident that teachers' teaching experience has no mutual relationship with teachers' competence in CIS. The number of years spent in the teaching profession may not determine competence in the use of CIS since computer is not used by the teacher to teach and there are no other school.

Recommendations

Research suggests that constructivist teaching is an effective way to teach. It encourages active and meaningful learning and promotes responsibility and autonomy. Considering the constructivist nature of many new curricula, it is important that the theory and concepts of transactional and constructivist teaching be communicated the stake holders including administrators.

Concluding Remarks

New curricula emphasize a holistic and constructivist rationale, and the implementation of these new curricula necessitates that teachers make significant changes in the way they teach. In addition to understanding the constructivist philosophy upon which these new curricula are based, teachers, administrators and others involved in implementing these new curricula need to understand the kinds of changes teachers need to undertake as they make the transition from more traditionalist forms of instruction to constructivist strategies as well as how they can make these changes. Generally speaking, professional and curriculum development is an evolving, personal developmental process that in itself is constructivist. This process can be greatly assisted by a supportive collegial and administrative medium that allows teachers to change their own personal constructs about teaching.

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