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Volume 19 Issue 1

Teacher Education in a
Volatile, Uncertain, Complex,
and Ambiguous World



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Teacher Education in a
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From the Convenor of 2014 34th ISfTE Conference in Turkey

Nuray Senemoglu, Hacettepe University, Turkey

We were delighted to hold the 34th ISfTE Conference for the very first time in Antalya, a wonderful city surrounded by historical sites. The conference was held on April 22-25, 2015. We hosted 162 participants from 27 countries. Abstract book is available at <http://isfte2014.org/AbstractBook.pdf>. As an international academic conference on teacher education, the goal of ISfTE2014 was to determine clear educational goals for the future generation of the VUCA (volatility, uncertainty, complexity, and ambiguity) world, encourage our students to develop effective and flexible strategies to cope with the challenges of such a world, and discuss how learning should be and offer insights and experiences.

Based on the success of the previous conferences by ISfTE, we received a large number of abstracts, which were organized into a variety of strands ranging from curriculum development, and educational measurement/evaluation to educational policy and administration. In total 145 papers in seven papers groups were presented. Our first plenary speaker, David C. Berliner (Arizona State University, USA), gave a talk on “The Many Ways that Poverty and Culture Affect School Achievement.” The second plenary speaker was Ali Baykal (Bahcesehir University, Turkey); he discussed “What Is the Favorite Color of Teachers?” The third plenary address by Steve Walsh (Newcastle University, UK) was on “Classroom Interactional Competence and Teacher Education.” I would like to acknowledge and thank our keynote speakers for accepting our invitation and sharing their invaluable experiences with us.

My committee and I would like to thank Secretary General Forrest Crawford, Colin Mably, and the Executive Board of ISfTE for giving us the opportunity to host such an important conference in Antalya, Turkey.

I would like to express my sincere thanks to the Rector of Hacettepe University, Prof. Dr. A. Murat Tuncer. I would also like to thank to the Organizing and Scientific Committees, Turkish Airlines, BROS Professional Conference Organizer, Yargı Publishing House and tour hosts who deeply contributed to the success of the conference.

We thank you all for your participation and look forward to seeing you at the next ISfTE seminar in New Jersey in June 2015.

About this Edition

Welcome to the 19th volume, first issue of the Journal of the International Society for Teacher Education. This edition of JISTE examines perspectives on teacher education, teaching, and learning. The theme of the issue is *Teacher Education in a Volatile, Uncertain, Complex and Ambiguous (VUCA) World*.

We are proud to present these nine articles representing different areas of the world. Each of these articles was presented in paper groups in April 2014 at the 34rd annual seminar of ISfTE convened by Hacettepe University in Antalya, Turkey. Each article selected for publication received feedback from the paper group in which its author(s) presented it. The authors then submitted the revised article, which then went through a double-blind review and further editing by the author(s) before it was accepted for publication.

Although each article has its local perspective, teachers and teacher educators can learn from each of these perspectives to enhance their own practices in other parts of the world. The interest of enhancing teacher education, teaching, and learning through addressing, researching, and discussing vital questions of current development is what unites both researchers and practitioners publishing in this issue and who are members of the International Society for Teacher Education.

In particular, we would like to thank our reviewers from all over the world for their assistance in reviewing articles for us. Without their continuous work and help as reviewers for JISTE, we could not have presented this issue of JISTE.

Karen Bjerg Petersen and Peggy J. Saunders, Editors

EFFECTS OF 7E LEARNING CYCLE MODEL AND CASE-BASED LEARNING STRATEGY ON SECONDARY SCHOOL STUDENTS' LEARNING OUTCOMES IN CHEMISTRY

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Abstract: *The purpose of the study was to determine the effectiveness of 7E learning cycle model, which is based on constructivist theory and case-based learning (CBL), on students' achievement in and attitude to chemistry. A total of two hundred and eight (208) SSII chemistry students drawn from some selected secondary schools in three local government areas in Ibadan, Oyo state, Nigeria participated in the study. Two stimulus instruments were used: Teachers' Instructional Guide for 7E Learning Cycle Model and Teachers' Instructional Guide for Case-Based Learning Strategy. They were complemented with Chemistry Achievement Test ($r=0.81$), Students' Attitude to Chemistry Questionnaire($r=0.84$), and Evaluation Sheet for Research Assistants. The study adopted pretest, posttest, control group, quasi-experimental design. Two hypotheses were tested at 0.05 level of significance and data collected were analyzed using analysis of covariance (ANCOVA). Multiple classification analysis (MCA) was used to present the magnitude of the mean scores while Scheffé multiple range test was used for post-hoc test to determine the source(s) of significant main effects. The results showed a significant main effect of treatment on students' achievement in chemistry ($F_{(2,207)} = 4.584$; $p < .05$] and students in the case-based learning group obtained the highest chemistry achievement score ($\bar{x} = 9.49$) followed by those exposed to the 7E learning cycle model ($\bar{x} = 8.40$) while the conventional method group obtained the lowest ($\bar{x} = 7.50$); there was significant main effect of treatment on students' attitude to chemistry ($F_{(2,207)} = 72.551$; $P < .05$] with the students exposed to case-based strategy obtaining higher attitude mean score ($\bar{x} = 69.21$) than those in 7E learning cycle model ($\bar{x} = 68.87$) and the conventional group ($\bar{x} = 68.54$). The two strategies, 7E learning cycle model and CBL, are more effective in improving senior secondary school students' achievement in and attitude to chemistry than conventional teaching strategy. However, CBL proved to be the most efficacious. Therefore, it is recommended that chemistry teachers should adopt constructivist/inquiry methods like 7E learning cycle model and case-based learning as these strategies will help students perform better in chemistry and also positively enhance the attitudes of many more students to the subject.*

Key words: learning cycle, cases, achievement, attitude, chemistry

Introduction

One of the subjects classified as a physical science is chemistry. Chemistry is the study of the composition, structure, properties, and interactions of matter. It focuses on atoms and their interactions which bring about changes in states or reactions. In Nigeria, chemistry is one of

the science subjects offered at the senior secondary level. In some schools, it is a compulsory subject for all the arms of SS1; while in other schools, it is offered only to the science students. The field of chemistry covers such a broad range of topics such as organic chemistry, inorganic chemistry, metals and non-metals, and applied chemistry.

The reports from the West African Examination Council's Chief Examiner (May/June, 2005, 2008 & 2009) show a trend of poor results. Adesoji and Olatunbosun (2008) stated that in spite of

the attempts made by researchers to improve on the teaching and learning of chemistry, the achievement of students in the subject remains low in Nigeria and discouraging (Nbina & Vico, 2010).

Table 1

Candidates' Performance in May/June Senior School Certificate Examinations in Chemistry in the Period of 2006–2012

Year	Chemistry Total Sat	Credit Passes	%
2006	308104	170670	55.34
2007	422681	194284	45.92
2008	418423	185949	44.97
2009	422091	194035	45.97
2010	365643	236059	50.70
2011	565692	280250	49.54
2012	627302	270570	43.13

Source : WAEC National Head Office, Yaba, Lagos, Nigeria

Researchers have shown that some causes of students' anxiety leading to the perception of chemistry as a difficult subject include: wide coverage of the syllabus, students' background problems, students' lack of interest in and poor attitude towards chemistry, low awareness of career opportunities, lack of teaching aids/laboratory, the abstract nature of science concepts, the teacher, traditional teaching strategies, and teacher-centered applications (Jegade, 2007; Kolomuc, Ozmen, Metin, & Acisli, 2012; Nbina & Vico, 2010). According to Caliskan (2004) methodology is the dominant factor in science teaching to achieve the goals of science education. The conventional teaching method used in teaching chemistry in many schools is a key barrier in achieving success in chemistry education.

The traditional approach for teaching chemistry is often overly simplistic and not aligned with the most recent scientific models. As a result, many students in Nigeria and even around the world lack fundamental understanding of many topics. One of the objectives for teaching chemistry is that students can use it to address scientific inquiries as well as

connect chemistry to contemporary concerns such as vaccines, incurable diseases, natural disasters, power-supply, and so on. The main goal of science teaching is that students have good understanding of concepts and imbibe the ability to apply this understanding to new situations. It is also popular that science should be taught to train dynamic individuals who question the events around them and analyze ideas. The number of the questioning and non-dogmatic individuals should be increased to let technology advance in the present age.

As scientists, students should develop basic skills, knowledge, and abilities required for tackling the difficult and non-difficult issues in their environment, and they should be able to raise new questions and use scientific means of answering them which would involve organizing or participating in controlled experiments, making observations, analyzing, and taking accurate records of data (Karanovich, 2013; Nbina & Vico, 2010). Rutherford (1964) as quoted in Caliskan (2004) stated, "We need to teach science as a process or method rather than as content" (p. 3). Scientific inquiry helps to

create an attitude of open-minded quest for answers to problems while applying the highest cognitive skills and engaging the student's full range of cognitive abilities.

Over time, much work has been done in researching about inquiry teaching methods hence, the derivation of new learning and teaching strategies. Among which are the 7E learning cycle model and case-based learning. The learning cycle was created by Karplus in the late 1950s and fully developed by Atkin and Karplus (1962) as *guided discovery*. "Learning cycle is the inquiry learning process pattern for learners to investigate the scientific knowledge through science process skill and to search for knowledge or significant self-learning experience based on constructivist theory" (Polyiem, Nuangchalem, & Wongchantra, 2011, p. 258). A learning cycle is a concept of how people learn from experience. Learning cycles can serve as basis for developing instructional materials such as lesson plans, worksheets, etc. A learning cycle helps teachers to think critically and strategically in order to meet the unique needs of students.

The 7E learning cycle emphasizes examining the learner's prior knowledge for what they want to know first before learning the new content. This cycle helps make for an effective learning process through seven steps:

Elicit: Teacher extracts or draws attention to prior understandings and knowledge. New knowledge is built on existing knowledge. This assists in transferring knowledge.

Engage: This stage focuses student thinking on content providing conversation opportunities for all students, not just a select few.

Explore: Here, students get to record data, isolate variables, design experiments, create graphs, interpret results, and organize findings while the teacher checks for students' understanding.

Explain: The teacher adopts a more central role while discussing information and explaining the concepts associated with the student's exploration. Lessons during this phase introduce the students to the scientific terminology that allows them to describe their experiences, as well as provide the opportunity for students to link their experiences to the scientific concepts being explored.

Elaborate: This phase of the learning cycle provides an opportunity for students to apply their knowledge to new domains, which may include raising new questions and hypotheses to explore. This phase may also include related numerical problems for students to solve. According to Eisenkraft (2003), this stage ties directly to the psychological construct called *transfer of learning*.

Evaluate: Evaluation can be formative, summative, formal or informal. Teacher assesses the extent to which set objectives have been achieved.

Extend: This stage is actually added to elaborate with the intention to explicitly remind teachers of the importance for students to practice the transfer of learning. Teachers need to make sure that knowledge is applied in a new context and is not limited to simple elaboration.

Another important feature of the 7E learning cycle is assessment of prior knowledge. This step can help the teacher realize what the students need to learn first resulting in efficient learning on the part of the students. The 7E model ensures that eliciting prior understandings and opportunities for transfer of learning are not omitted. With a 7E model, teachers will engage and elicit and students will elaborate and extend (Eisenkraft, 2003).

Case-based learning (CBL) is a pedagogical method that uses case studies as active learning tools. A case study is composed of an engaging and/or controversial story, usually a dilemma that requires a basic understanding of scientific

principles. It is also defined as analysis of a particular case or situation used as a basis for drawing conclusions in similar situations (Microsoft® Encarta®, 2009). CBL is largely used in teaching medicine, law, and psychology, and so on. Case-based learning provides an environment to enhance students' interest and enjoyment toward learning (Hereid, 2004; Yalcinkaya, Boz, & Erdur-Baker, 2012). Cases are usually composed of two main parts: (a) the case situation for the study or a story or narration of an event and (b) the questions related to the case situation. The purpose of the study questions is to direct students to facilitate their understanding, rather than simply asking for the names, dates, or labels in analyzing the data and suggesting solutions. Class discussion is facilitated by these study questions. Learners solve the presented problem using their background knowledge. Most instructors believe that it is a good way to get students to analyze data and highlight important aspects of a concept and that the approach was useful in disseminating the presentation of challenging material.

Attitude is one of the vital determinants of an individual's actions. Although there are many definitions of attitude, all the views agree that an attitude is an individual's disposition to think, feel, or act positively or negatively toward objects in his or her environment. Attitude has also been viewed as a non-observable psychological unit that can only be deduced from an expressed behavior, embracing a range of emotional behaviors such as prefer, accept, appreciate and so on (Adolpe, 2002; Welch, 2010). It is known that teachers' approach or technique within and without the classroom can influence students' learning either negatively or positively. Researchers have shown that students' attitudes towards science have a significant influence on their achievement in the subject (Prokop, Tuncer, & Chuda, 2007). This study provides ample information that is relevant to science, science teaching,

chemistry teaching, curriculum planners, educational administrators, policy-makers and planners in science education, and teacher education with respect to the inclusion of 7E inquiry model and case-based learning into the chemistry curriculum.

Hypotheses

H₀₁: There is no significant main effect of treatment on students' achievement in chemistry

H₀₂: There is no significant main effect of treatment on students' attitude to chemistry

Methodology

The research design employed in this study is the pre-test-post-test-control group quasi-experimental research design. The treatment operated at three levels: two experimental groups and one control group.

Participants and Scope

The participants were 208 senior secondary class two students from six, purposively selected senior secondary schools in three local government areas in Ibadan, Oyo State, Nigeria. Instruction was delimited to content material based on the 7E learning cycle model and case-based learning technique for teaching ionic theory, oxidation-reduction, mole concept, and electrolysis in chemistry as designed by the researcher.

Instruments

Five instruments were used in this study. They are

1. Teachers' Instructional Guide for 7E Learning Cycle Model
2. Teachers' Instructional Guide for Case-Based Learning Strategy (TIGCBL)
3. Chemistry Achievement Test(CAT)

4. Students' Attitude to Chemistry Questionnaire(SACQ)
5. Evaluation Sheet for Research Assistants (ESRA).

Pre-Treatment and Treatment Activities

Prior to the commencement of the experiment, proper approvals from school authorities and chemistry teachers were obtained. The teachers for the experimental classes were trained for a period of one week on the use of the treatment packages. For the pre-test, the Chemistry Achievement Test (CAT) and Students' Attitude to Chemistry Questionnaire (SACQ) were administered. The experimental and control groups were taught for a duration of four (4) weeks. At the end of the treatment, the same attitude test (SACQ) that was administered at the pre-test stage and a slightly reshuffled version of the achievement test (CAT) were administered to the students after their last lesson on the topic. The results were collected and analyzed in order to identify any significant difference in the learning outcomes of the student after exposure to treatment. Experimental group data were compared to those of the control group.

Data Analysis

The data collected from the experiment were subjected to analysis using analysis

of covariance (ANCOVA) with pre-tests scores as covariates to determine if there were statistical main effects found and multiple classification analysis (MCA) was used to present the magnitude of the mean scores. Scheffé's multiple range test was used for post-hoc analysis to determine the source(s) of significant main effects. All hypotheses were tested at 0.05 level of significance.

Results and Discussion

Table 2 shows that there is a significant effect of treatment on students' achievement in chemistry ($F_{(2,207)} = 4.584$; $p < .05$). This means that there is a significant difference in the chemistry achievement of students exposed to 7E learning cycle model and case-based learning and those in the control group. Hence, hypothesis 1 is rejected.

Table 2 shows that group 1 – case-based learning ($\bar{x} = 9.49$) differs significantly from the control group ($\bar{x} = 7.50$). Also, the 7E learning cycle model strategy group ($\bar{x} = 8.40$) differs significantly from the control group ($\bar{x} = 7.50$). This means that there are significant differences between each of the three possible pairs of groups in the study. They all therefore contributed to the observed significant effect of treatment on students' achievement in chemistry.

Table 2
Summary of ANCOVA of Posttest Achievement Scores in Chemistry by Treatment

Source of variance	Hierarchical Method				
	Sum of Squares	df	Mean Square	F	Sig
Covariate PREACHIVT	23.526	1	23.526	22.185	.000
Main Effect (Combined)	33.482	4	837.039	310.994	.000*
Treatment	98.413	2	49.457	4.584	.011*

* Significant at $p < .05$

Further, in order to determine the magnitude of the mean scores of students in each of the treatment and control groups, the MCA is reported in Table 3. From Table 3, results show that students in the case-based learning obtained the highest chemistry achievement scores ($\bar{x} = 9.49$). This group is followed by those exposed to the 7E learning cycle model (\bar{x}

= 8.40) while the conventional method obtained the lowest ($\bar{x} = 7.50$). This implies that the case-based learning was more effective than the 7E learning cycle and the conventional method. The order of decreasing magnitude of the chemistry achievement mean scores of the groups is represented as case-based > 7E learning cycle > control.

Table 3

Multiple Classification Analysis of Achievement Scores According to Treatment

Treatment + Category	N	Unadjusted Deviation	Eta	Adjusted for Independents + Covariates Deviation	Beta
7E	114	-.19		-.07	
Case-based	50	.85		1.02	
Conventional	44	-.51	.15	-.97	.20

Grand mean = 8.47

It is also necessary to trace the source(s) of the significant effect of treatment obtained in achievement in chemistry. The Scheffé

post-hoc analysis was therefore carried out and presented on Table 4.

Table 4

Scheffé Multiple Range Tests of Achievement by Treatment

Treatment	N	\bar{x}	7E	Case-based	Conventional
1. 7E	114	8.40		*	*
2. Case-based	50	9.49	*		*
3. Conventional	44	7.50	*	*	

* Pairs of groups significantly different at $p < .05$

Table 4 shows a significant effect of treatment on students' achievement in chemistry. This could have been due to the fact that inquiry-based strategies often provide a better platform as well as environment for more meaningful learning to take place. The strategies used in this study encourage active participation on the students' part while the teacher assumes the role of a guide and not instructor as is the case in a conventional chemistry class. Chemistry is often perceived by students as a difficult and abstract course. Therefore, any strategy that can demystify this subject is often welcomed by students.

Inquiry methods allow learners to learn by themselves.

7E learning cycle model was found to have a significant effect on students' achievement probably because of two major steps that are peculiar to this strategy. This is in accordance with Eisenkraft (2003) who suggested that the *elicit stage* was imperative for understanding the students' prior knowledge in order to know what the students need to know. The other stage, which is *extend* supports the process of transfer of learning whereby students can make connections between classroom

instruction and the outside world. 7E promotes the application of what is taught in class. These may have contributed to the success of this strategy in improving students' achievement in chemistry which is in agreement with other findings (Kanli & Yagbasan, 2007; Polyiem et al., 2011; Siribunnam & Tayraukham, 2009).

Case-based learning (CBL), according to the result findings of this study, also had a significant effect on students' achievement in chemistry. This finding is in line with the results of similar research (Hereid, 2004; Rybarczyk, Baines, McVey, Thompson, & Wilkins, 2001; Yadav et al., 2007) which supported the notion that case-based learning encourages critical thinking and understanding. In using cases in the form of short stories in teaching chemistry, it was observed that the students' interest was aroused. The students seemed to be motivated to learn more and they paid more attention to the teacher. A case-based class is a very

interesting class since it allows students to think and share their ideas and opinions without necessarily being 'correct'.

Results from this study also indicates that the case-based learning strategy was most effective followed by 7E learning cycle model and then the conventional strategy. This finding is perhaps due to the fact that 7E learning cycle model is more complex, somewhat 'alien,' requires more class-time, and expertise on the part of the teacher. Teachers intending to use 7E need to be thoroughly trained on how to follow the seven steps within a reasonable timeframe. Even though 7E is very efficient and more applicable in a science class, case-based learning is cheaper, requires lesser class time, and is easier to execute. Over the decades, cases or stories have been used successfully to teach subjects in the social sciences, humanities, and medicine, but its use in the teaching of chemistry is a welcome development as shown in this study.

Table 5

Summary of ANCOVA of Posttest Attitude Scores by Treatment

Source of variance	Hierarchical Method				
	Sum of Squares	df	Mean Square	F	Sig
Covariate PREATTITUDE	642.448	1	649.488	10.477	.000
Main Effect (Combined)	8922.193	4	2230.548	36.303	.000*
Treatment	8901.850	2	4450.925	72.551	.000*

* Significant at $p < .05$

Information in Table 5 demonstrates a significant effect of treatment on students' attitude to chemistry ($F_{(2,207)} = 72.551$; $P < .05$). This implies a significant difference between the mean attitude

scores of students exposed to 7E learning cycle model, case-based learning and those in the control group. To this end, hypothesis 2 is neglected. The magnitude of the groups' means scores is in Table 6.

Table 6

Multiple Classification Analysis of Posttest Attitude Scores According to Treatment

Treatment + Category	N	Unadjusted Deviation	Eta	Adjusted for Independents + Covariates Deviation	Beta
7E	114	-.29		-.01	
Case-based	50	.86		.33	
Conventional	44	-.23	.06	-.34	.03

Grand mean=68.88

Table 6 shows that the students exposed to case-based learning strategy obtained higher attitude mean score ($\bar{x} = 69.21$) than those in 7E learning cycle model group ($\bar{x} = 68.87$) and the conventional group ($\bar{x} = 68.54$) respectively. In essence, the case-based teaching strategy was more effective in improving students' attitudes

toward chemistry than the 7E learning cycle model strategy and the conventional teaching strategy respectively, thus, CBL > 7E learning cycle model > conventional strategy. Further the actual source of significance obtained for treatment effect on chemistry using Scheffé analysis tests is reported in Table 7.

Table 7

Scheffé Post-hoc Tests of Attitude by Treatment

Treatment	N	\bar{x}	7E	Case-based	Conventional
1. 7E	114	68.87			*
2. Case-based	50	69.21			*
3. Conventional	44	68.54	*	*	

* Pairs of groups significantly different at $p < 0.05$

Table 7 shows a significant difference in the students' attitude scores in 7E learning cycle model strategy ($\bar{x} = 68.87$) and conventional teaching strategy ($\bar{x} = 68.54$). Also, the case-based learning strategy ($\bar{x} = 69.21$) differs significantly than conventional strategy ($\bar{x} = 68.54$). These two combined significantly to the treatment on students' attitude to chemistry.

On the other hand, the attitudinal change between the 7E learning cycle model group ($\bar{x} = 68.87$) and case-based learning group ($\bar{x} = 69.21$) is not significant. This pair therefore did not contribute to the significant effect of treatment obtained in Table 7.

As seen in Table 5, the findings of this study are in contrast with the findings of Kilavuz (2005) but in line with those of Siribunnam and Tayraukham (2009) and

Yalcinkaya et al. (2012) who showed that case-based learning can improve students' motivation towards learning chemistry. When students are positively motivated, they tend to get more involved in the learning process. This is probably the same for 7E learning cycle. Perhaps, the students' interests were strategy. However, case-based learning proved to be the most superior.

Conclusions

From the findings of this research work, the use of constructivist strategies such as 7E learning cycle model and case-based learning strategies is more effective in improving senior secondary school students' achievement in and attitude to chemistry than conventional teaching as elicited by the 'nouvelle' or 'strange' method of learning chemistry. Just like in most schools in Oyo state, the chemistry

teachers had used the conventional teaching strategy in their chemistry classes and this strategy never improved the attitude of the students to chemistry. The researcher observed that the students showed signs of emotional attachment to the characters used in the stories. With the introduction of the 7E learning cycle model and case-based learning strategy, many students showed more willingness to learn chemistry. At the end of the study, the researcher could deduce that they have begun to like chemistry and were willing to drop the idea that passing chemistry examinations was far-fetched and unrealizable.

Recommendations

Based on the findings of this study, it is recommended that science teachers, especially those in the field of chemistry, should employ modern, practical teaching strategies such as the 7E learning cycle model and case-based learning that allow students to construct their own knowledge and actively participate in the learning

process. Secondly, science teachers should be adequately equipped with the skills needed to create an environment where all kinds of students can learn meaningfully individually or in groups especially in a chemistry class. Thirdly, a review and upgrade of the chemistry curriculum is also recommended in order to accommodate the inclusions of more learner-centered teaching strategies. Educational policy makers should take into consideration the desperate need for better policy, regulations, and laws that are geared toward the attainment of more meaningful chemistry education in Nigeria. Lastly, states and federal governments should, as a matter of urgency, make sufficient provision of scientific learning materials and laboratory facilities. Science teachers should also be morally and financially motivated and encouraged to introduce newer teaching strategies especially in chemistry education.

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INSTRUCTIONAL STRATEGIES, MATHEMATICAL ABILITY, MODE OF ENTRY, AND GENDER AS CORRELATES OF PRE-SERVICE TEACHERS' PERFORMANCE IN INTEGRATED SCIENCE IN NIGERIAN COLLEGES OF EDUCATION

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Abstract: *The declining rate of pre-service teachers' performance in integrated science has continuously engaged the attention and concern of stakeholders in Nigeria. Many reasons have been adduced, but effectiveness of instructional strategies adopted by lecturers and other student variables stand out. As panacea, researches have focused on collaborative teaching and self-regulation strategies without considering opportunity for peer instruction coupled with reflection before, during, and after lessons for subsequent adjustment and improvement in a rapidly changing classroom situation and student characteristics. An ex post facto type of descriptive design was used to explore the relationship among the variables involved in the study using 294 pre-service teachers purposively selected from six colleges of education in southwest Nigeria. Five instruments were developed, namely: Pre-service Teachers' Achievement Test ($r=0.85$); Pre-Service Teachers' Numerical Ability Test ($r=0.79$); Operational Guides for RRT, RRPT and Modified Conventional Teaching Strategy ($r=0.75, 0.72$ and 0.77 respectively). Three hypotheses were tested at 0.05 level of significance. Data were subjected to Pearson product-moment correlation and multiple regression. Results showed that instructional strategy ($r=.305$; $p<.05$) and mathematical ability ($r=.05$; $p>.05$) have positive significant relationship with pre-service teachers' performance in integrated science. On the other hand, mode of entry has no significant relationship ($r=.94$; $p>.05$) with the dependent variables. All the four factors jointly correlate positively with the pre-service teachers' performance in integrated science ($R=.377$). From the four factors mathematical ability made the highest contribution ($\beta=.221$) followed by instructional strategy ($\beta=.217$), then sex ($\beta=.074$), while mode of entry made the lowest contribution. It was recommended that peer instructional strategies coupled with reflection before, during, and after lessons should be encouraged in the teaching methodology course during the training period. Also, stakeholders should encourage pre-service teachers to improve upon their mathematics skills as this would go a long way to improving their performance and teaching skills in integrated science.*

Keywords: instructional strategy, mathematical ability, pre-service teachers, gender, mode of entry

Introduction

Integrated science study started in Nigerian Colleges of Education (NCE) in 1990-1991 session. Today, integrated science is offered in all colleges of education in Nigeria. The course has helped in producing manpower for the teaching of basic science at the primary and junior secondary school levels of

education. However, research reports show that the programme has not been quite successful (Olaewaju, 1996). Some reasons were adduced for the poor performance in the subject. These range from student factors like their poor attitudes towards science (Showers & Shrigley, 1995), lack of interest in science (Adepitan, 2003), lack of role models in the subject (Ivowi & Oludotun, 2001), and

poor mathematical background (Ogunleye, 2001). Government factors were also identified in the area of policy making, infrastructural provision, and teacher welfare (Ogunleye, 2001), as were teacher factors such as teaching methods employed (Adepitan, 2003; Kalijah, 2000) and unhealthy teacher-student relationship (Aysan, 1996).

There seems to be a general consensus of opinion among science educators concerning the vital role played by teaching methods or instructional strategies adopted by the teacher as these and other variables affect students' achievement and attitudes to science (Gbolagade, 2009). He emphasized the importance of appropriate teaching method in the development of skills required for making science content relevant to the growth and development of both the individual and the society and called for the adequate training of teachers, which should include the introduction of appropriate methods for teaching the subject-matter. Iroegbu (1998) observed that learners tend to derive maximum benefits in learning cognitive skills when the teaching strategy adopted involves the use of a mixture of different methods, while at the same time, creating opportunities for the learners to practice skills as a meaningful whole. Learners must, therefore, be exposed to situations that demand the knowledge and skills they are required to acquire and use. Many instructional strategies have been developed and found effective in teaching science. Examples are the collaborative group strategies for pre-service teachers (Gbolagade, 2009; Adedigba, 2002); problem solving and concept mapping (Orji, 1998); reform-based instruction (Barak & Shakhman, 2008); meta-cognition strategy (Eldar, Eylon, & Ronen, 2008); self-regulation strategy (Arsal, 2010); and predict-observe-explain strategies (Babajide, 2010) to mention but a few.

In spite of all these efforts towards improved teaching strategies, the performance of pre-service teachers in integrated science is still very low. Students need to be given opportunity to be actively involved in the learning process (Duyilemi, 2005). Teaching is not simply standing in front of a class talking; the best teachers contemplate the manner in which they will present a topic and have a wide variety of instructional models at their disposal (Orlich, Harder, Callahn, Trevisan & Brown, 2010). It is, therefore, imperative to search for instructional models that could appeal to learners and arouse their interest and at the same time help to achieve the objectives of science education.

To achieve the desired educational goals, teachers need to reflect on their teaching goals and how these interface with the demographics and abilities of their students. This process will, according to Clarke (2007), allow teachers to clarify their knowledge base, the content, and their students' learning styles. In choosing instructional strategies, teachers need to consider the challenges that the students may encounter and strategies to assist the students in overcoming them. After the lesson, teachers need to evaluate the lesson goals and the action of both themselves and their students as well as define the point at which difficulties emerged. Reflective teaching is a model that is grounded in constructivism and metacognition in which students and teachers are exposed to teaching and learning experience under the scrutiny of their peers and mentor or college supervisor who critiques their ideas (Clarke).

Reflection, according to Clarke (2007), refers to thinking about the actual teaching which involves the thought teachers have before, during, and after a lesson. This teaching strategy has not been given adequate attention in classrooms,

especially in science related subjects. Perhaps, however, it could be used to achieve the objectives of the basic science curriculum. At the pre-service level, it will be useful to train teachers who would adopt the strategy when they will be practicing later in their career. It is a means of professional development which begins in our classroom. It is paying critical attention to the practical values and theories which inform everyday action by examining practice reflectively and reflexively (Bolton, 2010). It involves the consideration of the ethical consequences of classroom procedure on students (Larrivee, 2000). As teaching and learning are complex, and there is not one single right approach, reflecting on different versions of teaching and reshaping past and current experience will lead to improvement in teaching practices. Reflective teaching is in three phases: the planning phase, teaching phase, and the debriefing phase. During the planning stage the teacher must use strategy(ies) like cooperative learning techniques, hands-on activities and so on (Clarke, 2007). Based on these, the researcher used two cooperative learning strategies with reflective teaching.

Reciprocal teaching (RT) is a student-centered instructional strategy in which students and teachers switch roles in a lesson. It is a cooperative learning instructional method in which natural dialogues model reveal learners' thinking processes about a shared learning experience (Foster & Rotoloni, 2005). Teachers foster reciprocal teaching through their belief that collaborative construction of meaning between themselves and students lead to a higher quality of learning (Allen, 2003). Students take ownership of their role in reciprocal teaching as they feel comfortable expressing their ideas and opinions in open dialogue. They take turns articulating with the learning strategy. The learning community is able to reinforce

understanding and to see, hear, and correct misconceptions that otherwise might not have been apparent. All members of the community have shared responsibility for leading and taking part in dialogue during learning experience (Hashey & Connor, 2003).

Reciprocal peer tutoring (RPT) is also an intervention in which one student provides instruction or academic assistance to another student. RPT is a form of cooperative learning, which has been found to be an effective technique for increasing students' academic achievement (Sharman, 1991; Slavin, 1991). Conceptually, RPT is similar to many activities ranging from the informal encounters of play to the most complex activities of cooperation in which people help one another and learn by doing so. This process transforms learning from a private to a social activity by making learners responsible for their own learning and that of others. Researchers have shown that both tutors and tutees gain immensely from participating in reciprocal peer tutoring (Forman, 1994; Griffin & Griffin, 1997; Slavin, 1991). In this process, students function reciprocally as both tutors and tutees. This dual role is beneficial because it enables students to gain from both the preparation and instruction in which tutors are engaged and from the instructions that tutees received (Griffin & Griffin, 1997).

The mode of entry of students into the NCE programme is an index of students' previous knowledge or entry behavior and based on student performance in an earlier examination. The Joint Admission and Matriculation Board (JAMB) was established by the federal government of Nigeria in 1978 to regularize the intake of students into universities and later polytechnics, monotechnics, and colleges of education to solve the problem of multiple admission given to some candidates at the expense of others

(JAMB, 1998). The mode of entry into the NCE programme is in two forms: direct entry which is handled by JAMB and through preliminary studies which is the mode handled by the colleges of education themselves. The opinion is that a prediction of a future examination result could be made with reasonable success on the basis of the result of an earlier examination and that grade may serve as predictive measure and as a criteria measure (Daniels & Schouten, 1978 as cited by Adeyemi, 2009).

Numerical ability of the pre-service science teachers is an important factor in effective science teaching. Studies have shown that numerical skills are necessary factors that support mathematics and science achievement. Nunnally (2004) defines numerical ability as the ability to solve problems in number sequencing, make accurate mathematical deductions through advanced numerical reasoning, interpret complex data presented in various graphical forms, deduce information, and draw logical conclusions. Numerical ability test is designed to measure the students' ability to use numbers to correctly solve problems. Such tests according to Olatoye, Aderogba, & Aanu (2011) signify basic arithmetic prowess in an individual and can be given directly to candidates or administered as subsets of other tests.

Gender has become an issue affecting performance of pre-service teachers in science generally (Agoro, 2002). It has been issue of concern to researchers and educators (Longe & Adedeji, 2003). Yet, studies on the influence of students' gender on academic performance have not produced conclusive results. Some findings indicate that a significant difference exists between performance of male and female students (Agoro, 2002; Akande, 2002) while other findings show that gender has no influence on students' performance (Ajanaku & Aremu, 2006;

Jimoh 2004; Raimi & Adeoye, 2002). Longe & Adedeji (2003) are of the opinion that science and technology is a male dominated subject. Here in lies the need for this study.

Statement of the Problem

Pre-service teachers' poor performance in integrated science has been an issue attracting the attention of researchers and science educators. This is crucial for a subject as important as integrated science and effective teaching and learning of basic science in Nigerian schools. Several factors have been adduced to be responsible for this trend. These include the instructional strategy used in teaching the subject at the NCE level which does not make a good level of performance on the part of the pre-service teachers. Also, the role of mathematics as the language of science has not been given a pride of place in instructional delivery. Studies also show that level of science experience is critical as NCE students enroll either directly from secondary school or after one year pre-NCE science programme.

This study, therefore, explores the relationships among instructional strategy, mathematical ability, mode of entry, and gender on pre-service teachers' achievement in integrated science in Nigerian Colleges of Education.

The following null hypotheses were tested in the course of this study at 0.5 level of significance:

H₀₁: There is no significant relationship between (a) instructional strategy, (b) mathematical ability, (c) mode of entry, and (d) gender on pre-service teachers' achievement in integrated science.

H₀₂: There is no significant composite effect of the four factors viz.: instructional strategy, mathematical ability, mode of entry, and gender on

pre-service teachers' achievement in integrated science.

H₀₃: There is no significant relative effect of each of the four factors (instructional strategy, mathematical ability, mode of entry, and gender) on pre-service teachers' achievement in integrated science.

Methodology

The study explores expo facto type of descriptive design. It is also correlational as it explores the relationships among the variables involved.

Sampling

Two hundred and ninety four NCE II pre-service teachers studying integrated science as teaching subject in 11 government-owned colleges of education (four owned by the federal government while the remaining seven by the state government) in southwestern Nigeria participated in the study. From these colleges, six (three federal and three state) were purposively selected based on their relative distance from one another.

Instruments

Five instruments were used in the study. These include

1. Operational Guide for Reflective-Reciprocal Teaching Strategy (OGRRTS). This instructional guide was developed by the researcher based on the philosophy of cooperative work among learners and reflection on the part of the trained lecturer. This operating guide is made up of four RT strategies of predicting, questioning, clarifying, and summarising. The interrater reliability of the guide was estimated using Scott's π . The interrater reliability index obtained was 0.75.
2. Operational Guide for Reflective-Reciprocal Peer Tutoring Strategy (OGRRPTS). This operational guide developed by the researcher consists of lesson plans based on the steps listed by Utley, Mortweet, and Greenwood (1997) as well as Fuchs and Fuchs (2003). The recommendations given were used to reconstruct the guide and the inter-rater reliability was then estimated using Scott's π . The interrater reliability index obtained was 0.72.
3. Operational Guide for Conventional Teaching Strategy (OGCTS). The instructional guide was self-developed based on the traditional ways of writing lesson notes. The main feature of the guide was general information, the procedure, the teacher, general objectives, content for each lesson, summary, and conclusion. The interrater reliability index obtained was 0.77.
4. Pre-service Teachers' Numerical Ability Test (PTNAT). The instrument was developed by the researcher and the internal consistency of the scores was determined using split-half method. The reliability index obtained was 0.79.
5. Pre-service Teachers' Achievement Test in Integrated Science (PTATIS). This instrument tested the pre-service teachers' intellectual achievement in speed and acceleration, linear momentum work, energy, and power. The test contains fifty multiple-choice objective test items. The reliability of the test item was determined using Kuder-Richardson Formula 20 (KR-20). The KR-20 value of 0.85 was obtained. Space was provided in the answer sheet where the pre-service teachers were asked to indicate their mode of entry into the college (that is, either through direct entry or through preliminary study).

Data Collection Procedure

The researcher personally visited the participating lecturers who are the lecturers handling the course in their respective colleges and trained them on how to implement the steps involved in the guides designed. Two lecturers were trained for each experimental group 1, experimental group 2, and the control group. The training covered one week for each of the three groups. The fourth week was used for pretest administration for all pre-service teachers participating in the study using the achievement test and numerical ability test. The fifth to tenth

weeks were used for the implementation of the treatment for each of the two experimental groups and the control group after which the posttest was administered.

Results

Data collected were analyzed using Pearson product-moment correlation and multiple regression.

H₀1: There is no significant relationship between (a) instructional strategy, (b) mathematical ability, (c) mode of entry, and (d) gender on pre-service teachers' achievement in integrated science.

Table 1

Correlations of the Independent Variables with Pre-service Teacher's Performance

Factors	Post-achievement	Treatment	Math Ability	Mode	Sex
Pearson-Correlation					
Post-achievement	1.000	.305	.305	.050	.094
Instructional Strategy	.305*	1.000	.369	.089	.048
Mathematical Ability	.305*	.369	1.000	.007	.051
Mode of Entry	.050	.089	.007	1.000	.064
Gender	.094	.048	.051	.064	1.000
Sig. (1-tailed)					
Post-achievement		.000	.000	.197	.054
Instructional Strategy	.000		.000	.064	.205
Mathematical Ability	.000	.000		.452	.192
Mode of Entry	.197	.064	.452		.138
Gender	.054	.205	.192	.138	

*Significant at $p < .05$

Table 1 shows that instructional strategy used has significant relationship which is positive with performance in integrated science ($r = .305$; $p < .05$). This means that as instructional strategy improves, pre-service teacher's performance in integrated science also improves. Hypothesis 1a is therefore rejected.

The table also shows that the relationship between pre-service teachers' mathematical ability and their performance in integrated science is positive and significant ($r = .305$; $p < .05$). This means that as mathematical ability improves,

performance in integrated science also improves, and hypothesis 1b is rejected. For hypothesis 1c, Table 1 shows that mode of entry has no significant relationship with pre-service teachers' performance in integrated science ($r = .05$; $p > .05$). The hypothesis is not rejected.

The table further shows that pre-service teachers' genders had no significant relationship with their performance in integrated science ($r = .94$; $p > .05$). Hypothesis 1d is not rejected.

H₀2: There is no significant composite effect of the four factors viz.: instructional strategy, mathematical ability, mode of

entry and gender on pre-service teachers' achievement in integrated science.

Table 2

Composite Effect of the Four Factors on Performance in Integrated Science

R	R Square	Adjusted Square	Std Error for the Estimate
.377	.142	.130	5.4175

Table 2 shows that the 4 factors correlate positively with the pre-service teachers' performance in integrated science ($R=.377$). They also contributed 13.0% of the total variance in the dependent variable

(Adj. $R^2= .130$). To this end, the four factors are quite relevant in the determination of pre-service teachers' performance in integrated science.

Table 3

Analysis of Variance

Model	Sum of square	df	Mean square	F	Sig.
Regression	1411.344	4	352.836	12.022	.000*
Residual	8511.246	290	29.349		
Total	9922.590	294			

*Significant at $p<.05$

Table 3 shows that the R value of .377 obtained in the regression analysis is significant ($F=12.022$; $p<.05$). Hence, the R value is not due to decrease. Based on this finding, hypothesis 2 is rejected.

H₀3: There is no significant relative effect of each of the four factors (instructional strategy, mathematical ability, mode of entry and gender) on pre-service teachers' achievement in integrated science.

Table 4

Relative Effects of the Four Factors on the Dependent Variable

Factors	Unstandardized coefficients		Standardized coefficients	Rank	t	Sig.
	B	Std. Error	Beta			
(constant)	24.371	2.062			11.819	.000
Instructional Strategy	1.629	.442	.217	2 nd	3.681	.000*
Mathematical Ability	.254	.067	.221	1 st	3.780	.000*
Mode of Entry	.492	.799	.034	4 th	.616	.538
Sex	.988	.727	.074	3 rd	1.358	.175

* Significant at $p<.05$

From Table 4, mathematical ability, made the highest contribution to the pre-service teacher's performance in integrated science ($\beta=.221$). This is followed by instructional strategy ($\beta=.217$). The third in the ranking is gender ($\beta=.074$) while mode of entry made the lowest contribution ($\beta=.034$). Of these mathematical ability (B=.254;

$t=3.780$; $p<.05$) and instructional strategy (B=1.629; $t=3.681$; $p<.05$) could predict pre-service teachers' performance in integrated science, and therefore, made significant contributions to the dependent variable.

Hence, hypothesis 3 is rejected for instructional strategy and mathematical

ability but not rejected for sex and mode of entry.

Discussion

The major findings of this study show a positive correlation between mathematical ability and pre-service teachers' performance in integrated science. As the level of mathematical ability increases, the performance of pre-service teachers also increases and vice versa. This implies that mathematical ability has positive influence on pre-service teachers' performance in integrated science. This may be expected in the sense that dynamics, which is the concept used as a physics aspect of integrated science and is quantitative in nature; therefore, students with high numerical skills are likely to record higher performance in it than their counterparts with low numerical ability. Also, this finding reiterates the fact that mathematics being a language of science is highly needed for and students to perform credibly well in science. This result is in agreement with the findings obtained by Emeke and Adegoke (2001) and Adu (2002) that the higher the mathematical ability of students, the better their performance in the physics achievement test.

The findings of this study also revealed that the type of instructional strategy used by the teacher has positive effect on pre-service teachers' performance in integrated science. Pre-service teachers' better performance may be due to the fact that they worked cooperatively with their peers thereby providing the social context for them to actively learn and make deeper connections among facts, concepts, and ideas. This developed their social and communication skills, increased cooperation and tolerance of one another as pre-service teachers were from diverse backgrounds working together to achieve group goals and aspirations. This made learning more permanent. The positive influence of instructional strategy on

performance may also be due to the fact that it utilized a group reward system and interdependence that maximized learning and motivation. The pre-service teachers were active learners in the classroom. They took active part in the planning and delivering of the lessons thereby acquitting them with the role of a teacher. This finding is in agreement with earlier research results that found that the instructional strategy used by teacher can have positive effect on students' performance in science (Clarke, 2007; Doolittle, Hicks, Triplett, Nichols, & Young, 2006; Fantuzzo, King, & Heller, 1992; Fuchs & Fuchs, 2003; Griffin & Griffin, 1997; Mayfield & Vollmer, 2007; Slavin, 1991).

The findings of this study also revealed that pre-service teachers' gender does not have effect on their performance in integrated science. This finding supports earlier research results that suggested students' gender does not have any influence on their performance in science (Ajanaku & Aremu, 2006; Jimoh 2004; Raimi & Adeoye, 2002).

Recommendations

Based on the findings of this study, it was recommended that teachers should use effective and innovative strategies which are student center to teach science in order to improve their students' performance. Also such innovative strategies should be used to train pre-service teachers so that they will be familiar with those strategies and find them easy and convenient to use when practicing as a teacher. Pre-service teachers should be encouraged by their teachers to have positive attitude to mathematics as this would help in improving their performance in science.

Governments should organize a form of in-service and re-training programmes for teachers in the effective use of innovative and effective teaching strategies through

organization of seminars, workshops, and conferences for science teachers to improve their teaching skills as well as improving the performance of their students.

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PARTNERSHIPS IN PROFESSIONAL LEARNING: ENGAGING WITH SECONDARY TEACHERS TO SUPPORT LITERACY IN A GLOBAL WORLD

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Abstract: *In a global and volatile world, teachers are being constantly challenged to support students' literacy development and assist them to develop knowledge and skills to expand into new ways of knowing. This two-year school-university partnership is dedicated to enhancing teachers' learning about language with the goal of building teachers' repertoires in ways that promote effective literacy teaching within their subject specific teaching areas in an Australian high school. The project is grounded in theories of knowledge structures of discipline learning within the sociology of education and associated social semiotic theories of language as a resource for meaning making. The project utilizes formative experimental methodology to understand how teachers enact text-based approaches to school-based literacy. Initial findings reveal how a partnership based on trust, mutuality, and reciprocity motivated teachers to make small but measurable changes to their classroom practice in one area of literacy development.*

Keywords: teacher professional development, communities of practice, school-university partnerships, language-based theory of learning, teacher capacity

Introduction

Teachers play a critical role in preparing students to “think, learn and communicate with texts” (Vacca, Vacca, & Mraz, 2011, p.1) and in assisting them to develop knowledge and skills to expand into new ways of knowing. Consistent with the new Australian Curriculum (ACARA, 2012), this two-year project honors a school-university partnership in “ensuring appropriate transition in language learning to support initial and ongoing teacher education, to collaborate on research, and to promote and reward language learning.” The aim of the project is to provide professional learning and resources for high school teachers with the expectation of building their repertoires in ways that promote effective literacy teaching and learning within their subject specific teaching areas. The project focuses its research on one high school's engagement in ongoing professional learning dedicated to building teacher capacity to support literacies across the curriculum. It explores how a school's dialogue about literacy is

shaped and by whom. The project is motivated by an understanding of the synergies among the processes and structures that engage teachers' buy in to literacy, contextual factors that mould teachers' pedagogic decisions, and teachers' capacity to adopt literacy pedagogical practices. The purpose of this paper is to document how the school-university partnership, in its first year, is supporting teachers in one area of literacy development with the promise of improved outcomes for student learning across the curriculum.

The Challenge of Literacy Learning in the Adolescent Years

Researchers and educators worldwide agree that as students move from primary to secondary school, they will struggle with the changing demands for reading and writing across the curriculum (Maclean, 2005). This view presumes that fundamental skills gained in the primary years are insufficient for working with more complex disciplinary knowledge. As

Heller and Greenleaf (2007) theorize, “A foundation doesn’t make a house, and basic skills don’t make for high-level competence” (p. 20). As students move through their schooling, they are met with an increasing specialization in literacy development in the curriculum. As students move through the middle years of school, moreover, they are likely to add more complex routines and responses to their reading and writing repertoires. Shanahan & Shanahan (2008) observe that these routines and responses tend to be general rather than subject specific. Predictably, as students move into the senior years of school, literacies become even more discipline specific.

A fundamental challenge for secondary teachers is how to embed literacy into their existing pedagogy in ways that increase student access to the curriculum without jeopardizing curriculum content or reducing discipline knowledge. Freebody (2012) discerns that the existing issue for literacy education is “the different ways in which literacy is put to work in the different curriculum areas.” As Faulkner (2012) found, making the shift to accommodate literacy into their classroom practice requires teachers to adapt or alter their pedagogical approaches to satisfy the requirements of their curriculum area. Faulkner also found that teachers’ pedagogic choices are frequently influenced by the context within which they plan and teach. For example, when limited time is available for sharing large amounts of content, the pedagogy is often reduced to ‘telling’ and ‘control,’ where ‘telling’ is often a lecture and recitation is used to cover content (Vacca et al., 2011); notwithstanding, this same pedagogy may not be conducive to student talk and active engagement with learning.

In Australia, there is growing acceptance that all teachers share responsibility for supporting students’ literacy development and explicitly teaching the “conventions of

language and text patterns within their own learning area” (ACARA, 2012, p. 14). A student’s knowledge of language resources to create academic language needs to be sufficiently rich to access the language resources of specialized academic discourses. Each learning area in the secondary curriculum has its own distinctive explanation of phenomena, and a way of locating people and communities. For example, the language of Mathematics is quite distinctive, as are, for example, the languages of Economics, Music and Science. Students, however, do not instinctively acquire these distinctive languages. Therefore, teachers will need to make explicit the unique ways in which language and literacy is embedded within certain disciplines (Freebody, 2012). As well, teachers across disciplines are expected to develop a shared understanding about how language works in academic contexts. ‘Metalanguage’ acts as a key tool in building a common language that is accessible to teachers, students and parents in talking about language (Derewianka & Jones, 2012).

A Language Based Theory of Learning

In keeping with the Australian Curriculum (ACARA, 2012), teachers are expected to implement a *functional approach to language* that is concerned with how language functions to enable us to make meaning that subsequently shapes our school and adult lives. A functional model of language draws on Halliday (2009) whose view of language is construed as a process of ‘learning how to mean’ through which we cultivate our ‘meaning potential’ (Halliday, 1992, p.19). A functional approach to language is guided by a theoretical framework grounded in theories of knowledge structures of discipline learning within the sociology of education (Bernstein, 1999; Christie & Maton, 2011; Maton, 2007, 2011) and associated social semiotic theories of language as a resource for meaning making (Macken-Horarik,

1996). It draws on language resources developed by academic literacy researchers (Derewianka & Jones, 2012; de Silva Joyce & Feez 2012; Feez & Joyce, 1998; Humphrey & Maton, 2010).

Drawing on Halliday's work, Australian linguists Martin (1985), Christie (2005), and others have designed a 'genre-based' (or text-based) approach that is founded on the understanding of "making the language demands of the curriculum explicit so that all students have access to the linguistic resources needed for success in school and to the powerful ways of using language in our culture" (as cited by Derewianka & Jones, 2012, p. 4). In recent times, researchers and literacy educators have applied the notion of genre to the examination and teaching of written text, and identified the general patterning of spoken and written texts used in school contexts. The notion of genre, identifiable structural patterns within texts, enables us to achieve our social purposes through language within a specific context (Martin & Rose, 2008). These genres relate to different disciplines within school curricula and to the different fields of work. Learning to recognize and to work with these genres "enables students to understand how to structure discourse to meet educational and work purposes, to critique what is presented to them and mould genres to their own communicative purposes" (de Silva Joyce & Feez, 2012, p.16).

Across all years of schooling, Australian teachers are expected to provide their students with sufficient language resources to achieve expected outcomes for purposes of explaining, arguing, describing, and recounting across a range of disciplines in a range of media and modes (Derewianka & Jones, 2012). In secondary school contexts, for example, students need to be proficient in a range of genres or text types in order to be successful learners across the curriculum in school and beyond. Because

their teachers are trained to be experts in their discipline area, it does not follow that all teachers can recognise, and explain explicitly, the language and literacy demands of their discipline area. As each learning area of the Australian Curriculum is rolled out, high school teachers are being challenged with applying their knowledge about language to adapt programs for the literacy teaching and learning students will need to achieve expected curriculum outcomes. Consequently, teachers will need access to professional learning and resources for learning about language and how a *functional approach* to language better equips them to support their students "to learn language, to learn through language and to learn about language" (Derewianka & Jones, 2012, p. 4).

Context of the Project

In this two-year project conducted in 2013 and 2014, a newly formed school-university partnership between an Australian high school in the nation's capital and an Australian regional university provided impetus for building secondary teachers' capacity to support literacies across the curriculum. The project developed out of school community concern stemming from the school's disappointing results in the writing portion of the National Assessment Program – Literacy and Numeracy (NAPLAN) which students are required to do at years 5, 7, and 9. Predicated on the notion of literacy as a capacity for making meaning across the curriculum (ACARA, 2012), the school adopted a whole-school approach to addressing the writing needs of students in developing literacy proficiency across the curriculum and coupling these explicitly to the new Australian Curriculum. Professional learning and resources for scaffolding teachers' learning about language in all learning areas was developed jointly between the school and the academic partner. The professional learning

promoted genre as a part of an explicit approach to teaching and learning, featuring effective strategies for scaffolding students through explicit teaching of language and language resources that they need to be successful writers in high school.

Professional Learning Communities

This Australian project draws on a U.S. study investigating high school teachers' engagement with literacy practices in professional learning communities (Styslinger, Clary, & Oglan, 2014). It focuses its investigation on the notion of Wengers' *communities of practice* or otherwise known as professional learning communities advocated by DuFour and Fullan. By drawing on available or alternate structures and resources for enabling teachers' learning in more collaborative ways (Fullan, 2005), the project seeks to understand how a school might engage in an intervention designed to promote a school-based approach to literacy learning using collaborative practitioner-based research.

The literature of school improvement (DuFour, Eaker, & DuFour, 2005; Fullan, 2005) is unequivocal that schools with 'strong teacher communities' have the potential to 'reinvent practice' and 'advance learning' (Fullan, 2005; McLaughlin & Talbert, 2010). As Hargreaves and Fullan (1996) and Louis and Marks (1996) uncovered, school cultures have the capacity to respond to critical inquiry and create opportunities for dialogue. Subsequently, a school's culture is most likely to improve when teachers come together to dialogue about practice and "learn from each other on an ongoing basis" (Fullan, 2005, p. 221). As Lunenburg (2010) advises, school leaders invested in improving student learning and success might focus on "developing the capacity of staff to function as a professional learning community" (p. 6).

Creating a professional learning community, however, demands thinking about structures and cultures of schools that must be 'brought to the surface, examined and discussed' with participants in the process. "Educators who acknowledge and honestly assess their current reality are far more likely to be successful in changing it" (DuFour et al., 2005, p. 250). Accordingly, to achieve a change in culture, schools will need to establish structures that enable teachers to work and learn collaboratively and to engage in sharing, learning and evaluating, and cross-role participation (Darling-Hammond & McLaughlin, 1995).

Wenger's original notion of *communities of practice* (1998), for example, may be applied to an education context where small groups of teachers come together to make sense of their practice by interrogating communal concerns. Within the literature, a community of practice is now accepted as 'the foundation of a perspective on knowing and learning that informs efforts to create learning systems' (Wenger-Trayner, 2012). A school, therefore, is not the 'privileged locus of learning: it is part of a broader system.' A community of practice has the capacity to 'influence theory and practice.' In a school context, however, 'changing the learning theory is a much deeper transformation' (Wenger-Trayner, 2012) evolving from teacher engagement in peer-to-peer deep learning about theory and practice in communities where teachers have autonomy over their learning agenda and membership of a community (Wenger-Trayner, 2012). In principle, communities of practice offer the 'promise of enabling connections among people across formal structures' (Wenger-Trayner, 2012); in a school context, teachers work in collaborative environments characterized by a non-hierarchical structure.

School-University Partnerships

A distinguishing feature of this Australian project is the school-university partnership. The literature on professional development schools and school-university partnerships underscores the notion of schools as learning communities in an external collaboration designed to assist teachers to improve their practice. A survey of the literature reveals a range of activities designed to benefit the partnership including supervision and mentoring, collaborative teaching initiatives, action research, joint professional development, shared planning, and school enrichment and support.

The need for robust school-university partnerships continues to be a ubiquitous theme in the teacher education literature. The Professional Development School (PDS) that emerged in the United States in the mid-1980s concentrated on professional development school partnerships for (a) preparing future educators, (b) providing current educators with ongoing professional development, (c) encouraging joint school–university faculty investigation of education-related issues, and (d) promoting the learning of P–12 students (National Association for Professional Development Schools [NAPDS], 2008). It was championed as a joint venture by a regular public school and a university or a college of education to address new educational challenges (Darling-Hammond & Bransford, 2005; Kennedy, 1990). Kennedy emphasized the potential of such a partnership: “When you *combine* what university people bring with the experience and practical knowledge that teachers have, you get powerful new educational approaches that neither one can produce alone” (p. 14).

In Australia, the need for forming partnerships has been promoted by a suite of official reports and commentators/

researchers. Commenting on the Australian context, Brady (2002) found

While these partnerships have produced invaluable collaboration, there have been further forays in recent years, most notably those involving joint participation in school-based research, and shared planning for, teaching of and assessment of prospective teachers. (p. 1)

My interest in school-university partnerships stems from recent work as a coordinator engaged in a professional development school (PDS) partnership in a southeastern university in the USA. From my perspective, also supported by Zuercher, Yoshioka, and Buelow (2014), the benefits for both the school and the university include the ‘reciprocal, relational’ aspect of professional development, mutual funding opportunities, and the involvement of classroom teachers in collaborative research. In accepting the role of critical friend/staff developer, I entered into a reciprocal partnership based on trust and understanding, and to which I would bring new knowledge, perspectives and insights about literacy education in authentic contexts, and the teachers would contribute practical knowledge and experience about teaching in their discipline specific contexts.

Methodology

This project draws on formative experimental methodology (Reinking & Bradley, 2008). Literacy researchers (Jiménez, 1997; Reinking & Watkins, 2000; Welch, 2000) have used this research methodology in response to inadequacies of traditional qualitative and quantitative research methods. The formative research design allows researchers to become actively engaged with the participants and organizations involved in the research and to encourage change (Jiménez, 1997). Formative

research seeks to improve instruction through a mix of qualitative methods of investigation and interventions in learning situations (Jacob, 1992). The epistemological stance associated with formative research is *pragmatism* (Reinking & Watkins, 2000), that is, data collection, analysis, and interpretation are dedicated to the pedagogical goal(s).

This project is supported by practitioner-based action research, a form of formative research, where researchers and teachers collaborate in the design, implementation, and analysis of practice (Reinking & Bradley, 2008), giving them the assurance to review and implement teaching

approaches. As a part of the research design, the process requires teachers to implement the intervention, specifically designed to implement a literacy pedagogical model to extend students' literate practices and raise literacy across the school, as well as document the outcomes of their professional learning efforts. As illustrated in Figure 1, the project consists of six phases of professional activity designed to improve teacher pedagogy over two years. The project design is largely informed by the literature of teacher change (Darling-Hammond & Bransford, 2005; Darling-Hammond & Young, 2002; Guskey, 2000; Hattie, 2009).

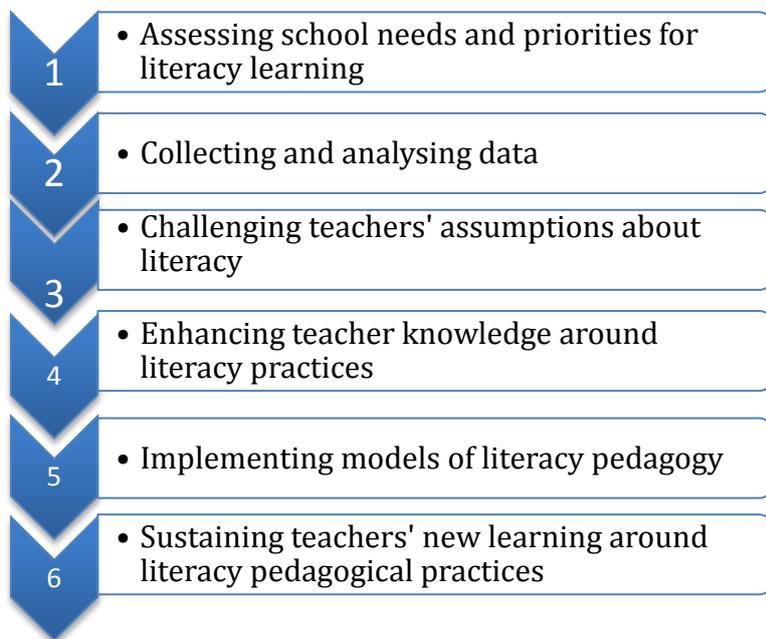


Figure 1. Project Design for Improving Teacher Pedagogy

Teacher participation in the first year involved all staff in professional learning offered in staff meetings and professional development days. The professional learning was designed in collaboration with the school and the academic partner with the goal of providing teachers with new learning about language, as well as a stimulus for teachers to reflect on their work and how their work can be demonstrated to and shared with others. It

proposed approaches for scaffolding the development of literacy skills and strategies to assist students to meet the literacy demands more effectively. Specifically, the professional learning targeted writing in response to a decline in students' writing performance in the NAPLAN tasks. Teachers focused their attention on assessment tasks that require students to write extended text, using

samples of student writing to identify literacy learning needs.

At the start of the project, a sample of eight teachers representative of the discipline areas was invited to engage in action research over two years. The following methods were selected to gather data from a range of teachers as well as examining some teachers' experiences in greater depth: (a) Survey using Qualtrics software to collect baseline data about teacher participants; (b) Interviews with a sample of teachers during and after the intervention; (c) Interviews with school principal and school literacy leader; (d) Video footage of classroom practice to capture teachers' practice following the intervention; (e) Other data e.g. student work samples, assessment tasks, school assessment data, e.g. NAPLAN.

Data analysis consisted of elements used from grounded theory and that of content analysis.

Findings and Discussion

This section consists of a looking back and across the project's first year. It details emerging insights about teachers' learning that can be best represented as three strands: (a) processes and structures to engage teachers in literacy professional learning, (b) contextual factors that mould teachers' pedagogic decisions, and (c) teacher capacity to adopt literacy pedagogical practices.

In this section, the nature of the school-university partnership as it unfolded in the first year is also examined.

Processes and Structures to Engage Teachers in Professional Learning

Having an infrastructure in place has enabled the school to progress its goals to improve literacy. Prior to the school-university partnership, the school enacted strategies to increase the focus on literacy

across all learning areas by establishing a Literacy Coordinator role which attracted a teacher release component, and a School Improvement Committee to oversee teaching and learning. To embed literacy in the discipline discourses, each of the learning areas was now required to have a literacy plan and report outcomes annually.

Consistent with the literature of *communities of practice*, the school was a part of 'a broader learning system,' having participated in joint projects with other universities and the wider education community. At the principal's instigation, the school has developed its own *communities of practice* (alias COPs), designed primarily to support the *National Professional Teaching Standards* (NPTS). In an effort to motivate staff to engage students in literacy learning across the curriculum, the school identified literacy as a priority area for COPs. In its first year, teachers elected to join an across curricula teacher community supported a teacher facilitator, whose role was to collaborate with the community of teachers about their learning agenda. A COP's facilitator cited 'two broad but related themes,' that guided his community of practice in the first year:

The first is the application of high expectations in the classroom; the second is to understand what habits and skills differentiate our high achieving students from our medium to low ability students....We have also focused on the implementation of high expectations and literacy through professional reading....

Consistent with the principal's 'hands off' approach to COPs, teachers reported the benefits of a structure that can enable teachers 'to set our own project and its parameters as we feel more ownership over what we do.' Aside from building new professional relationships and collaborating across disciplines, a teacher attests that COPs has "opened our doors and made us more open to sharing our work and our ideas." As a vehicle for

peer-to-peer feedback about one's teaching, teachers reported that COPs as a 'learning system' has afforded them learning about 'new teaching techniques' and 'new behaviour management strategies.' However, as one teacher opines, "sometimes coordinating opportunities to observe each other can be difficult," lamenting that she/he "wanted to ask for cover every now and then but felt bad doing it as it impacts whole school budget..."

Indicative of how COPs was making impact on teachers' pedagogical practice, a teacher facilitator reported that teachers are engaging in "honest and fruitful conversations" about what they are doing in their classrooms, thereby "leading to changes in the way they teach their classes and an improvement in pedagogy." Similarly, a teacher attested: "Rather than avoiding issues which may be leading to disengagement, we are open to discussing and improving them and the no-blame culture leads to discussions which are positive and empowering rather than negative and critical."

Contextual Factors that Mould Teachers' Pedagogic Decisions

A broader context for this project is the Australian Curriculum. The implementation of the Australian Curriculum Phase 1 has fostered increased dialogue about literacy across the curriculum. At the start of this project, most teachers demonstrated that they possessed a good grasp of the requirements of the 'literacy' strand detailing their students' literacy skills development in their learning areas. Most, if not all, acknowledged that it is their responsibility to incorporate literacy into their classroom practice and programs. Nonetheless, the act of adopting a literacy pedagogy in one's classroom and the show of a commitment to literacy are not mutually exclusive, as this project found.

From the outset, the school's community agreed that literacy is important; thereby, creating the perception that literacy is the responsibility of all teachers. A decline in students' performance in NAPLAN (2011-12) prompted the school community to collectively find ways to improve students' writing. The Literacy Coordinator has since championed a school literacy handbook, now published on the school's website, in collaboration with the parent and academic community. Literacy spotlights are now featured at school assemblies and staff meetings. Closer collaboration with local primary schools has also started. While such initiatives are encouraging, the real test lay in teachers taking risks in adopting a new pedagogy necessitating recognition by principals and others who work closely with teachers that teacher change is a gradual and difficult process (Guskey, 2002). It follows that teachers must come to use new pedagogical practices as routine practice, but they will require follow-up and support.

Teacher capacity to adopt literacy pedagogy

While it is accepted that all teachers, regardless of their teaching area, are teachers of literacy, nevertheless, systematic planning for content learning and literacy learning, though essential, can be complex on many levels. As well, it is important to acknowledge that no innovation will be implemented uniformly (Guskey, 2002). In this project, teachers in some curriculum areas have started to shift in their thinking about how to meet the writing needs of their students. For example, to complement a persuasive text as an assessment item for year 7, physical education teachers have instituted a fitness journal across years 7-9 and invited students to use multimodal texts as a platform for assessment tasks in year 9. To address literacy in the mathematics curriculum, faculty introduced a persuasive

text into an assessment task in years 7-8. This task was subsequently removed following parental concerns alleging that the text type should be taught in English. Ultimately, several mathematics teachers remained unconvinced about the use of a text-based approach. Similarly, science teachers have been cautious of adopting a genre-based approach, favoring 'cherished practices' developed and refined over time. The inference is that teacher and community awareness of how literacy is pervasive across disciplines is at odds with current policy and thinking about literacy education, and that there exists reluctance by teachers to take ownership of literacy development in the high school years.

Inevitably, professional learning involving new theoretical understandings can be irritating and threatening for teachers (Guskey, 2002). Teachers will contest the adoption of new pedagogical practices unless they are confident they can make them work (Guskey). As this project reveals, teachers are not 'too keen on theory,' and moreover, they want to know 'what works' in their distinctive learning area. Nonetheless, observations underline teachers' willingness and readiness to make 'small changes' to classroom practice in one area of literacy development, specifically writing, in their efforts to enhance student learning in the secondary curriculum at large.

The Possibility of School-University Partnerships

As critical friend, teacher educator, and researcher, I have sensitively navigated an informal reciprocal partnership based on trust and teachers' impetus for new deep learning. I have been enthusiastically welcomed into the school and earned teachers' trust in the deepening of a partnership to which I am contributing new knowledge, perspectives, and insights. What this research confirms is that teachers and teacher educators essentially want to work together in ways that respect

each other's unique contributions. Moreover, as the findings indicate, reciprocal and relational partnerships are most likely to emerge from a commitment that the focus of participation is the learning of all members of a learning community, most importantly, student learning.

The findings indicate that an effective and enduring partnership has a *focus on learning*, linked to the school's priorities, in this case, literacy, and the needs of all members of an extended learning community focused on, and working toward the shared goals for a whole school approach to literacy learning. At the heart of the partnership is the development of *professional authentic relationships* afforded by the institution of the partnership and stimulated by the anticipation of professional conversations among all members of the learning community. Notably, this partnership is being enriched by *enabling structures*, such as COPs, affording a space for members of a learning community to start new learning relationships by valuing each other's contributions in forming committed relationships within the context of a safe and supportive environment.

Hopes and Challenges

In an era of educational change characterized by uncertainty and ambiguity occasioned by the introduction of national curricula and an increasing focus on accountability measures, it is important that teachers have a clear understanding about language and how their knowledge about language is essential in planning, teaching, assessing, and supporting students in achieving expected educational outcomes. This project underlines the benefits of a school-university partnership supported by targeted professional learning to help teachers better understand the challenges of how they develop approaches about teaching language learning across the curriculum. It provides

insights into how teachers might start to identify and design interventions to address new literacy demands in their discipline specific contexts.

To do this work, however, schools need to have structures in place that support teachers' work and learning through collaboration (Darling-Hammond & McLaughlin, 1995; Fullan, 2005). Teachers in this project attest to the potential of *communities of practice* as a vehicle for motivating pedagogical change, and consequently, student achievement. Moreover, the project reveals how site-based context-specific professional learning provides a positive context for teachers to reflect critically and openly on

their teaching, and how teachers are willing to exert a high degree of agency over educational outcomes with the promise of improved literacy pedagogy. It is the hope that these teachers will continue to build a repertoire of teaching practices and pedagogical skills focused on reading and writing that will effectively meet the targeted learning needs of their students. Indeed, as the partnership endures, we expect to expand our knowing about the synergies among the processes and structures that can engage teachers' buy-in to literacy, the contextual factors that govern teachers' pedagogic decisions, and their capacity to adopt literacy pedagogical practice.

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MAKING OMELETTES WITHOUT BREAKING EGGS: IMPROVING THE COMPREHENSION SKILLS OF TEACHERS OF ENGLISH AS A SECOND LANGUAGE IN NIGERIA SECONDARY SCHOOLS

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Abstract: *Reading comprehension skill is an important aspect of language acquisition that has far-reaching implications on the life of any student. Weak comprehension ability invariably affects not only students' performance in English language, but it hinders competence in other critical fields. Reading comprehension skills are not being taught in ways to promote students' acquisition of the required skills. This study reveals the extent to which teachers impart comprehension skills to students by focusing on the teachers' practices during comprehension lessons. From the study, the majority of the teachers, rather than teach during comprehension lessons, test the students; thereby, depriving the students of having basic comprehension abilities. This study reveals that for teachers who lack the knowledge of comprehension skills to facilitate the acquisition of such to students is akin to making omelette without eggs. The study shows the need for the teacher training curriculum to be reviewed as the teachers' inability is traceable to their teacher training foundation. The study further remarks that there is the need to review teacher training curriculum so that emphasis can be laid on how to teach reading comprehension skills to students.*

Keywords: reading comprehension, teaching skills, teacher training.

Introduction

English language is the official language in Nigeria; thus, it is the basis upon which almost all educational developments are built for individuals from kindergarten to the tertiary life. English language is a compulsory subject in secondary schools in Nigeria, and it is a prerequisite for admission into higher institutions such as universities, polytechnics, and colleges of education, but for some years there has been alarming failure of students in English language conducted by the regional body – West African Examinations Council (WAEC, n.d.).

Many reasons are adduced for this poor performance of students; primarily, emphasis is often placed on the nature of pedagogy (Adegbile, 2012; Ojo, 2003; Oredein & Oloyede, 2007; Tabulawa, 2013). This is because teachers play a pivotal role in the teaching and learning process; their qualifications, training,

experience, and motivation contribute to making them one of the primary determinants of students' academic and lifetime achievements (Abimbola, 2014; Ayodele & Adegbile, 2007). The findings of most of these researchers reveal that English language teachers have a lot of responsibilities and challenges as they are in the forefront of those “to inculcate in learners permanent literacy in English and help them to lay a solid foundation for academic success at higher education level” (Federal Republic of Nigeria, 2004, p. 9).

Comprehension and Competent Language Acquisition Skills

Comprehension lessons are integral aspects of English language acquisition; thus, they serve as a foundation for the development of the critical skills students need to negotiate their ways with all other texts in fields that are different from languages. Through comprehension

lessons students acquire comprehension skills of predicting, self-questioning, evaluating, summarizing, clarifying, making inferences, and vocabulary development. Several studies have shown the many critical components of text comprehension, which are necessary in comprehension lessons (Akande, 1993; Closs, 2006; Dewitz, Jones & Leahy, 2009; Presley, 2000). These components include vocabulary instruction or vocabulary learning strategies and background knowledge. In order to develop strong comprehension competence, these strategies and others such as word recognition, fluency, knowledge development, and vocabulary need to be taught to students by teachers who themselves have acquired the necessary pedagogy and experience (Dewitz et al., 2009).

Teachers' Role to Promote Competent Reading Comprehension Skills

The importance of teachers in the drive for competent comprehension abilities cannot be over-emphasised. As teachers, they have the privilege to deliver effective instruction to engender positive literacy skills. Good instruction by expert teachers is the most powerful means of promoting the development of proficient comprehension and preventing reading comprehension problems. For effective comprehension to take place teachers are to teach certain skills and strategies through the text instead of just making the students answer comprehension questions. Many factors could aid students' reading comprehension skills and are within the teachers' control. The central role of teachers in students' ability to comprehend is undisputable (Closs, 2007; Pardo, 2004). In further assertion of teachers' responsibility in reading comprehension development, Pardo (2004) stated Once teachers understand what is involved in comprehending and how the factors of reader, text and context interact to create

meaning, they can more easily teach their students to be effective "comprehenders." (p. 1).

Many studies have endorsed important instructional strategies that teachers should use to teach comprehension skills and strategies during comprehension lessons. These multiple-strategy instructional routines include reciprocal teaching (Palinscar & Brown, 1984) and transactional strategies (Brown, Presley, Van Meter, & Sehuder, 1996). Teachers are expected to use these strategies to teach students comprehension strategies and skills such as predicting, making inferences, summarizing, evaluating, self-questioning, comprehension monitoring, and asking questions. Teachers are expected to have the knowledge and ability to teach and model these strategies and make use of practices that reflect their knowledge of the complex and fluid interrelationships among readers, texts, and purposes for which the text has been written.

Teachers' practices in comprehension lessons have been the focus of many scholars who have revealed that several factors influence these practices in comprehension lessons such as the teachers' beliefs and their practical knowledge about the purpose and goal of comprehension. Teachers' knowledge and beliefs are important determinant of their classroom practices (Meijeret, Verloop & Beijaard, 2001; Richardson, Anders, Tidwell, & Lloyd, 1991). In their study, Richardson et al. investigated the influence of teachers' beliefs on their practices in reading comprehension lessons and observed

The variance in teachers' beliefs in typically described as falling somewhere between the belief that reading is a skill that begins and ends with decoding and the belief that reading is a transactional process

between a reader and a text within a social context. (p. 564)

Similarly, Akande (1993), Lawal (1993), Shih (1992), Richardson et al. (1991) focused on teachers' practices in comprehension lessons instruction from varying angles and with divergent results. These scholars revealed the important role of the teacher in comprehension lesson instruction and revealed that a teacher's weak knowledge base about teaching comprehension would make such a teacher ineffective.

A major obstacle that hinders the effective teaching of comprehension is the lack of expertise by teachers on how to teach comprehension, conceptual knowledge, and vocabulary effectively (Haskins, Murnane, Sawhill, & Snow, 2012). While some teachers have prerequisite teaching qualifications, they lack the skills to teach comprehension due to a lack of current knowledge of comprehension instruction as well as the underlining factors of teaching comprehension. Meijeret et al. (2001) investigated the nexus between teachers' practical knowledge and their practices in comprehension lesson, the study revealed that despite the qualification of the teachers:

A relatively large number of teachers appeared to focus on small components of teaching reading comprehension while a relatively large number of teachers appeared to consider reading comprehension as not being very important. (p. 182)

Teachers in the Nigerian educational system use one of three major instructional modes which we have identified as teaching, testing or questioning, and teaching/testing to facilitate their classroom practices. Each of these instructional modes determines the extent to which students will develop life-long comprehension skills. Differences arise between teaching, testing, and

teaching/testing comprehension. When teachers read a passage or ask students to read a passage and attempt the questions that follow, they have not taught but tested. When teachers take learners through modeling and call into play the learners' knowledge, such the teachers are engaged in teaching and when the students are evaluated, the complementary teaching and testing paradigms reveal the appropriate mode of teaching. The situation in reading comprehension lessons is that teachers move freely from, testing to teaching, and teaching to testing. It does become imperative to investigate what teachers actually do in reading comprehension lessons.

Purpose

As a result of the mass failure in English language by secondary school students in Nigeria due to ineffective teaching of reading comprehension skills, this study investigated how far teachers' practice in reading comprehension lessons are responsible for students' failure. This study examined the instructional practices adopted by teachers in comprehension lessons based on the parameters of teachers' age, educational qualification, experience, and gender. The current study, in its concern at helping teachers to teach comprehension skills successfully, sought to identify the patterns of teachers' practices in comprehension lessons in secondary schools in Ibadan city, Oyo State, Nigeria. Ibadan is the third largest city in West Africa, and it is the political and business epic center of southwest Nigeria excluding Lagos.

A descriptive survey research design was used. The eight-week study sought to answer these four questions:

1. What practices do English teachers engage in during comprehension lessons?

2. What is the pattern of English comprehension teachers' practices based on their age?
3. What is the pattern of English comprehension teachers' practices based on their experience?
4. What is the pattern of English comprehension teachers' practices based on their qualifications?

Data were analyzed using frequency count and percentage distribution.

Procedure

Forty-five teachers of English as a second language (ESL) were selected from eighteen secondary schools located in six local government areas that make up the Ibadan metropolis. The teachers were selected because they were qualified to teach senior secondary students in the selected schools. In Nigeria's school system, teachers are often designated to teach the senior students based on some parameters like years of experience and qualification. Three teachers were picked from each of nine schools; while the others were picked from the remaining schools in varying numbers from each school.

Participant observation technique was used. As the teachers taught comprehension lessons, the researchers recorded and took photographs as well as wrote their observations in their notebooks. The teachers were asked some questions after the lessons.

Instruments

Teachers' Comprehension Teaching Observational Schedules (TCTOS), an instrument adapted from Grasha-Reichmann's Learning Style (1996), was used to gather information. The instrument met face and content validity and had a reliability co-efficient of 0.72.

Results

Of the 45 teachers who were part of the study, the data revealed that only 5 teachers (11.1%) engaged in teaching; 25 teachers (55.6%, the largest group) engaged in testing; and 15 teachers (33.3%) engaged in the combination of teaching and testing.

All five teachers taught comprehension were between the ages of 41-50 years and in that group, three have been teaching between 11-15 years and the other two have between 21-25 years of teaching experience. Among this group, two of them have B.A. degrees and three have B.Ed. degrees.

The demographics of the group of 25 teachers who engage in testing were more varied as could be expected given the size. Three of the teachers were 20-30 years of age; nine teachers were between 31-40 years old; 10 teachers were between 41-50 years old, and 3 were older than 50. The numbers remain the same when examining the years of teaching experience: three have been teaching for 1-5 years; nine have been teaching 6-10 years; 10 have been teaching 11-15 years; and three have been teaching 21-25 years. Their teaching qualifications are as follows: six have a B.A., 13 have a B.Ed., and 6 have B.Ed./M.Ed. degrees.

The last group was the 15 teachers who engaged in the combination of teaching and testing. Seven of them were between the ages of 31-40, and the other eight were between 41-50 years old. Seven had been teaching between 6-10 years; six had taught between 11-15 years, and two had been teaching between 16-20 years. The teaching qualifications in this group were that two of the teachers had a B.A.; 11 had a B.A/M.A, and three had B.Ed/M.Ed degrees.

What is apparent in the foregoing results is that irrespective of qualification or years of experience, most teachers of reading comprehension in the study area tested students instead of teaching them comprehension skills. It is therefore not surprising that most of the students lack the strategies that will help them to read effectively and acquire information to pass their exam in the subject.

Recommendations

Based on the foregoing, the following recommendations are made.

It was observed that the majority of the teachers do not teach but test students during comprehension lessons; therefore, it is recommended that teachers should be given on-the-job training to update them on contemporary strategies of teaching comprehension skills.

A need to review teachers' education curriculum of tertiary institutions in Nigeria is evident. These institutions must teach and model the appropriate strategies of teaching comprehension skills in school.

It was observed during the study that some teachers seemingly engage students in testing because of the unavailability of recommended texts by students. Government and parents must ensure that such texts are available for each student and in the library. The situation where teachers' copies of selected texts were also not available in schools must be urgently

addressed. Teachers cannot make omelettes without the students having eggs.

Government and school officials should continue to monitor schools to ensure that teachers fully use appropriate strategies teaching reading comprehension skills.

Conclusion

This study has established that English language teachers adopt three different strategies namely, teaching, testing, and teaching/testing in their effort at promoting the acquisition of comprehension skills by students, and this has been ineffective according to the students' test results. From observation, the majority of teachers engage the strategy of testing students instead of teaching the students the comprehension skills first before they are asked to apply the skills in answering selected questions on passages read. This poses a major problem to students' ability to comprehend language and non-language texts. This results in their failure in examinations.

Appropriate recommendations that would improve teachers' classroom practices in comprehension lessons have been made. Government and other stakeholders will need to take appropriate steps to address the present problem in the teaching of comprehension skills at the secondary school level in Ibadan in particular and Nigeria in general.

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SECONDARY-SCHOOL STUDENTS' INTERNATIONAL VOLUNTOURISM EXPERIENCES: EFFECTS ON WORLDVIEWS, BEHAVIOURS, AND ASPIRATIONS

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Abstract: *In this case study, we document the experiences and perspectives of six young women who participated in two or more voluntourism projects while in secondary school. Participants completed individual interviews where they discussed the impact of their voluntourism experiences on their worldviews, behaviours, and aspirations. Voluntourism appeared to foster participants' long-term commitment to social justice and equity issues at global and local levels, with some participants expressing affiliated career ambitions. While participants reported enjoying being part of a community of like-minded individuals, they also discussed tensions, transitional difficulties and frustrations associated with their voluntourism experiences. To this end, we conclude by providing recommendations to prepare teachers for supporting youth's deconstruction, reflection, and meaning-making processes.*

Key words: secondary school students, voluntourism, beliefs, agency, critical questioning

Introduction

Preparing twenty-first century students to live in a global village is complex (Pike & Selby, 2000). It is imperative to prepare students for the ambiguity and uncertainty of our complex twenty-first century, "because ours is a world in which connections and consequences reach across borders and leap oceans" (Bennett, Cornwell, Al-Lail, & Schenck, 2012, p. 34). International volunteer abroad programs provide one vehicle for fostering youths' global understandings (Garcia & Longo, 2013; Norden, Avery, & Anderberg, 2012). However, supporting students' abilities to make meaning of their international experiences is requisite to maximizing the potential of these experiences (Norden et al.). Questions therefore arise about educators' roles in guiding and facilitating these discussions and their preparation to do so during teacher education programs.

Over the past decade, there has been significant increase in students' interest in

volunteer abroad programmes (Dykhuis, 2010; Jefferess, 2012; Tiessen & Kumar, 2013). International volunteer abroad programmes hold the potential to transform youth by awakening new understandings of themselves, others, and their world (Crabtree, 2008; Dykhuis, 2010). Short-term volunteer abroad programmes, known as *voluntourism*, offer participants, who are predominately middle-class students, the opportunity to travel to developing countries where they engage in community service projects (Crabtree, 2008; Tiessen & Kumar, 2013). Even participation in a single short-term voluntourism experience holds the potential to enhance secondary-school students' personal growth, social awareness, and/or social relationships (Brown, 2005; Dykhuis, 2010; O'Sullivan & Smaller, 2013). However, little, if any research has explored the effects of participating in multiple short-term voluntourist trips while in secondary school. This study addressed this void in the literature.

In this paper, we begin by providing an overview of literature related to volunteer abroad programmes. This is followed by our methodology and findings. We outline the benefits participants derived from voluntourism including engagement, agency, and resituating of selves. We conclude with specific recommendations for teacher educators about how to prepare teachers to become engaged in critical dialogues with youth in order to support students' abilities to reflect critically on their experiences and the social-historical context of the areas where they volunteer.

Voluntourism

There are a wide variety of programs for students interested in volunteering abroad. The term voluntourism is used to describe volunteer abroad trips that are under one month (Tiessen & Kumar, 2013), with study abroad and international service denoting ventures of one to six months or longer. Voluntourism, like study abroad programs, are often intended to benefit participants primarily; whereas, service learning trips are intended to provide reciprocal benefits to communities and participants (Crabtree, 2008).

International volunteer abroad experiences have the potential to enhance global understandings (Garcia & Longo, 2013; Grierson & Denton, 2013), with many organizations offering youth the opportunity to participate in programs that combine educational tourism with community service. Research has documented that a single voluntourism experience can enhance secondary-school participants' personal growth, social awareness, and/or social relationships in general (Brown, 2005; Dykhuis, 2010; O'Sullivan & Smaller, 2013).

Voluntourism, however, is not without its critics. Through a meta-analysis of the volunteer abroad literature, Sherraden, Lough, and McBride (2008) qualified that

many, if not most, participants are young, affluent, and white, with these demographic characteristics affecting their perceptual lenses and experiential outcomes. Simpson (2004) cautioned that rather than enhance global understandings, participation in these programs can perpetuate stereotypes by reinforcing simplistic boundaries where commonalities amongst people are ignored and differences between "us and them" are emphasized. Poverty becomes the definer of difference rather than a shared experience caused by systematic oppression and marginalization. Collectively, such views may lead participants to focus on luck as a rationale for their position in the world.

Additionally, Plum and Jorgenson (2012) cautioned that voluntourist programs have the potential to perpetuate the neo-colonial practices they seek to overcome. They asserted that such programs may reinforce relations of superiority/inferiority, with the youth who come to "help" or "save" the less fortunate "others" often unaware of this positioning, or the underlying ethical issues of colonialism and oppression. Moreover, they argued that "behind benevolent appropriation such as 'helping' is often a failure to critically reflect on one's position relative to the rest of the world" (p. 31).

Although Dykhuis (2010) documented that voluntourism was beneficial to secondary-students' personal growth, she concurs that most participants are poorly equipped to address global inequities and awareness of stereotypes. Dykhuis adds voice to others (Plum & Jorgenson, 2012; Simpson, 2004) that participants need to be engaged in social justice pedagogy that emphasizes commonalities and assists students in understanding the conditions that create and perpetuate injustice and inequality in the host country with attention to stereotyping, relativism, and culturally sensitive exploration of ethical dilemmas.

Without structured opportunities to reflect critically on their experiences, youth who volunteer abroad may lack the resources to deconstruct ethical dilemmas that they encounter, such as the causes and consequences of poverty, moral codes, and/or personal values in the host culture (Epprecht, 2004; Tiessen & Kumar, 2013). While voluntourism participants may recognize social problems and ethical dilemmas, without guided critical reflection they are unlikely to search for a higher level of understanding about why such problems exist and how they originated (Epprecht, 2004; Monard-Weissman, 2003).

Tiessen and Kumar (2013) recommended that volunteer preparation and debriefing programs focus on connectedness, complexity, and critical literacy. Additionally, they argued that without structured preparation and reflective debriefing, youth returning from voluntourism trips may become angry with, or feel alienated from, their peers or family members who did not share these experiences. They echoed Epprecht's (2004) assertion that without appropriate deconstruction and support, the saliency and meaning of participants' experiences may diminish over time.

Canadian youths' increased interest in voluntourism can be attributed in part to the *Me to We* organization (Tiessen & Kumar, 2013). Established by humanitarians Marc and Craig Kielburger, *Me to We* is a Canadian business described as a "social enterprise" (Jefferess, 2012). *Me to We* markets motivational speakers and volunteer trips to developing countries, where the affiliated non-profit organization *Free the Children* is engaged in international development work (Jefferess). Additionally, *Me to We* hosts annual *We Days* for tens of thousands of Canadian, American, and British students that feature humanitarian celebrities and seek to empower youth to be agents of

positive social change. With these events broadcasted simultaneously into many schools, *Me to We* and their affiliated "schools-in-action" clubs are becoming mainstays of school systems (Jefferess).

Me to We provides sustainable funding to *Free the Children* by donating half of their profits to this non-profit organization (Jefferess, 2012). These funds support the international development projects undertaken by *Free the Children* that focus on enhancing education, health care, water and sanitation, agriculture, and alternative income opportunities of designated villages in developing countries (Kielburger, 2009). As a function of the relationship with *Free The Children*, *Me to We* voluntourism participants engage in international development projects.

Despite the popularity of voluntourism (Jefferess, 2012; Tiessen & Kumar, 2013), there is relatively little research investigating how participation in multiple voluntourism experiences affects the worldviews and behaviour of youth. In this study, we explored the experiences and meaning-making processes of students who participated in multiple *Me to We* voluntourism trips while in secondary school. The research questions addressed were

1. How do voluntourism experiences influence participants' worldviews, behaviours, and aspirations?
2. How do participants make meaning of their voluntourism experiences?

Methodology

Qualitative methodologies are appropriate when researchers wish to gain a deep understanding of individuals' experiences and perspectives (Creswell, 2012; Merriam, 2002). In this study we sought to understand the phenomenon of voluntourism as experienced and shared across participants. We adopted a basic interpretative case study methodology

where participants were bound by shared international experiences facilitated by the same host organization.

***Me to We* Voluntourism**

All participants engaged in *Me to We* voluntourism and affiliated *Free the Children* international development projects (see www.metowe.com/living-me-to-we/why-me-to-we-products-are-different/why-trips/). Their travels ranged from 10 days (winter break) to 21 days (summer). Pre-trip preparation focused primarily on logistics (e.g., insurance, packing lists). While away, participants interacted with local community members as coordinated by *Me to We* and were involved in ongoing initiatives such as school building. Participants stayed in enclosed camps built for youth with all excursions outside of the camp to designate locations under the supervision of Canadian *Me to We* youth facilitators. As part of their programs, participants engaged in activities intended to familiarize them with the daily realities of the host community. For instance, while in Kenya participants engaged in a water walk where they hiked to a local river situated a few kilometers from their camp to fill and return with large canteens of water. This activity was intended to illustrate one of the daily responsibilities of women in the community, promote considerations of complexities associated with access to education and health care, and underscore the importance of *Free the Children's* water well initiatives.

Participants

Participants were six Canadian adolescent females (pseudonyms Megan, Elizabeth, Jude, Ariana, Rose, and Sarah). Each had completed two or three voluntourism trips while in secondary school. Participants described themselves as belonging to “middle class” families living in “hick town” or “cookie cutter” neighbourhoods

with little ethnic and/or cultural diversity. Participants learned about voluntourism through information sessions, teacher volunteers and/or chaperons, or other youth at their schools. The cost of each *Me to We* trip ranged from \$3000 to \$5000. Rose financed her own travel. Megan, Elizabeth, and Jude covered their travel costs through a combination of personal contributions, fundraising, and parental support. The remaining two participants' parents fully funded their travels.

Data Collection and Analysis

Participants completed two semi-structured interviews ranging from 60 to 90 minutes in length that were conducted by a graduate student trained in qualitative interview techniques. Feedback from participants indicated they felt at ease with the research assistant and perceived her as a peer versus parent or teacher – criterion identified as desirable in context of deconstructing youth's international experiences (O'Sullivan & Smaller, 2013). Interviews were open-ended, audio recorded and transcribed verbatim. Transcriptions were read and analyzed first as single cases (Bogdan & Biklen, 2007) and then reread for the purposes of cross-case analysis and comparative analyses (Merriam, 2002).

Findings and Discussion

Analysis of participants' post-travel reflections, meaning making processes, and resulting behaviours documented that they perceived they benefited from their voluntourism experiences. Unfortunately, participants also demonstrated some beliefs consistent with the perpetuation of global stereotypes and emphasis of “us and them” differences. More positively, some participants demonstrated evidence of emerging criticality. We contextualized these findings in the literature, emphasizing the importance of structured preparation and debriefing.

Engagement and Leadership

Consistent with the voluntourism literature, these young women reported their travels to be “life changing” and “eye opening” (Brown, 2005; Dykhuis, 2010; O’Sullivan & Smaller, 2013). They expressed increased efficacy beliefs about their abilities to enact change and contribute to the betterment of international communities.

My top interest is social justice and helping people in third world countries to have a better life. (Rose)

Me and my friends have goals to change the world... it’s going to happen... it’s a slow process... but we are going for the little acts in total to make a big difference. (Jude)

Five participants intended to integrate international service into their postsecondary studies, in some cases despite parental concerns about the hardships associated with such a career choice. Rose intended to address social justice issues nationally, “I thought I would kind of help and change things here as opposed to going across the world”.

Participants believed that they benefited personally from their experiences with two participants qualifying their gains as greater than those of the host communities, “I think I benefited way more than anyone else there which is unfortunate” (Megan), “What we did for them could never amount to what I got from them” (Sara). Several participants contextualized their contributions as part of ongoing, community-driven, sustainable initiatives.

I learned that I could help and make a difference even if it’s a small difference. (Ariana)

We’re doing something for them and that will have an impact...it’s something that

they desired, asked for, and it’s significant. (Elizabeth)

I do think in five years down the road it will still be giving back to the community. (Rose)

They also attributed their voluntourism as motivational in terms of continued engagement with social justice issues, “I became significantly more involved” (Sara). Participants independently formed connections between their secondary school courses and social justice issues. They inquired about global issues during class and selected social justice related topics for assignments. Megan and Jude indicated that discussions with teachers familiar with voluntourism were especially valued.

He is by far the most like inspirational teacher I’ve ever had in my life. (Jude)

We would have discussions with our teacher even long after class was over... me and him and my friend would get really into talking about some international, like some world issue, or some theory or something. We just would not stop talking. (Megan)

Participants also presented formally and informally about their voluntourism experiences. They assumed leadership roles as part of *Me to We* schools-in-action programs where they encouraged peer participation in a number of social-justice initiatives and voluntourism.

We have a social justice club and we work with the non-profit organization Free the Children and I’m the President of that group and we do fundraisers and awareness, raise funds on health, water, alternative income, and education for communities in third world countries. (Rose)

I brought two people on this trip [2nd voluntourism] with me...not only do I want to make an impact with people in these countries but I want to help Canadians make the impact as well. (Elizabeth)

We shared a lot, we spoke about our experiences at the Free the Children club meetings ...we got to talk to other people at our school... everyone was eager to share. (Megan)

All participants expressed strong intentions to participate in additional voluntourism. The interconnected web of *Me to We* and *Free the Children* youth oriented programs and experiences appeared to foster these participants' sustained commitment to social justice, affirming the assertion that the match between participants and the host organization affects participants' outcomes (Sherraden et al., 2008).

Positionality, Behaviourism, and Advocacy

Similar to other youth (Dykius, 2010; Simpson, 2004), participants returned with increased appreciation for being Canadian and receiving national health care and education, "Once I came back I was more focused and saw how privileged we were to live in Canada" (Rose). While they described their good fortune as circumstantial, some also acknowledged that poverty and marginalization existed in Canada, "there are places like that in Canada" (Jude), "We forget that so much is actually happening here in Canada...we kind of sweep it under the rug or we don't always see" (Rose).

Like other youth (Pluim & Jorgenson, 2012), participants appeared to be inspired by what they perceived as a universal orientation towards "happiness" regardless of living conditions, "Seeing how happy they were there with how little there was there" (Sara).

You got to that community and you'd watch these kids and they'd be dancing and smiling and holding hands and laughing...it is the happiest country I've ever seen [Kenya]. And I used to think it was sad or everyone wanted something more, but they don't. The parents just want their kids to be able to learn and to be able to have clean water. (Jude)

Over time, some participants began to question their observations. For instance, Rose and Sarah spoke about the complexities of poverty. Megan and Adriana's happy-but-poor beliefs were challenged upon returning home when they queried the physical appearance of children they encountered and were informed that they were likely malnourished.

Two of the students had passed out due to malnourishment and dehydration....we had to go run and bring juice boxes to and granola bars just so they could stay conscious enough to last the five hour drive to the nearest medical centre, which is insane...it's just ridiculous that they have to go so far and the conditions are so serious. It was a real shock...this is real. These are issues that are legitimately happening. (Rose)

I remember we would be playing with the kids and there were like little circles above their teeth that were darker in colour and their hair was like a little bit red. I remember asking, "Oh what are those things on their teeth? Is it from lack of brushing teeth? What is it?" And he [physician] said, "it's actually from malnutrition"...I was just really shocked because what I thought that was like a very simple thing like brushing teeth but it was actually due to something much deeper. (Megan)

Participants explained that their voluntourism experiences motivated them to change their daily behaviours, "seeing it,

made me do something instead of just reading about it” (Elizabeth). They become resource aware and engaged in conservation.

We found ourselves very water conscious and we'd turn off the light...if we saw someone else do it [not conserve] we would call them out on it...before we would probably just let it go or we wouldn't even notice. (Rose)

I still take staggered showers.... I don't understand the concept of leaving the water on the whole time I just don't get it. There are definitely things like that which I still do. (Sara)

Participants also reported increased willingness to speak against global stereotypes and critique media representations.

How the media portrays...India, like it's such a dirty place, it smells so bad, like the people are disgusting, they're rude. There are so many negative assumptions about the culture. I'm just like, "No that's not it at all. You've got it totally wrong." There are these assumptions and all these stereotypes. (Rose)

One of my friends [said]... "Go to China because China is developing to be something. If you build a school you will actually help someone become something. Africa is Africa. It's never going to change"... So I am saying, "that's not necessarily true... you just have to give people the opportunity to prove themselves". (Elizabeth)

When I thought of Africa I just thought of like the sad kids you see on TV and poverty and it's [personal belief] changed so drastically...the media like doesn't portray anything right... It's crazy. (Jude)

In part, participants' reflections and behaviours are consistent with those

described by Dykhuis (2010) where youth accepted their global position as birth-related happenstance with little thought to underlying causations and factors that maintain social inequities. These participants differed however in their willingness to engage in behavioural changes and challenge stereotypes.

Reflecting and Transitioning

Participants acknowledged the importance of reflection for meaning making, explaining that they could only engage in such processes after returning home.

It wasn't until I got home and I saw the clean water did it click and it wasn't until I went to the grocery store and I saw the bananas did that click... that was my "ah ha" moment. (Elizabeth)

You had so many of these weird thoughts that were out of place and then you just had to piece them together and it worked when you were home, but I couldn't have had that realization when staying there because you're still blind when you're there. (Jude)

Consistent with Tiessen and Kumar's (2013) assertion, many participants felt "out of step" with family and peers when they returned home, with this tension greatest following their first voluntourism trip. Participants expressed being "critical", "angry", and "judgmental" of those who appeared wasteful of resources, materialistic, and/or unconcerned about social justice issues, "coming back to Canada and seeing how people who are well off here don't even care...got me angry" (Ariana). Rose and Sara explained that others could not be expected to understand poverty and inequality without exposure to critical events.

You come back and you are sort of judgmental, it's just because they haven't

had the same experiences you have and you've seen different things. [You think] "how can you be wasting that food and water? People don't have that". (Sara)

Some participants believed their family and peers were incapable of understanding their experiences, "it was difficult because none of my friends can relate to a trip like that ... your parents aren't there" (Elizabeth). Instead they gained support from each other and other youth they met via voluntourism.

She [voluntourist friend] said, "I hate my room and I hate my pillow and I don't like my TV and I don't like the clothes in my closet." ... "She gets it. She gets it."... She came home and said, "I don't know what to do" and was like, "It's okay. I didn't either." (Jude)

They described these relationships as meaningful ones that allowed them to connect with like-minded peers, "I became friends with them all. They were really awesome, and it was a good group" (Megan), "I just try to align myself with people who can think on a global scale" (Elizabeth). These relationships also provided a network to exchange information and coordinate social justice activities.

We'll message each other and be like, "Read this article, read this article". (Jude)

My friends who have similar interests in social justice, since we aren't in the same school, community, or even the same province, we always talk about how our social justice clubs can help each other ...we talk about what we can do together (Rose)

Consistent with Brown's (2005) assertion, participants valued their relationships with other voluntourism participants, attributing engaging in subsequent trips, in part to these relationships.

Emerging Criticality

These participants demonstrated differing levels of criticality with respect to their volunteerism. Jude and Ariana, the youngest participants appeared the least critical. Ariana continually referred to her voluntourism as "mission trips". Jude used the term "charities" throughout her interviews and seemed "star struck" by opportunities to travel with nationally known facilitators.

I remember in grade six I read an article on Craig Kielburger and then you know I signed up for this trip and I watched the documentary and I was like oh my gosh, like you started this whole thing....My favourite public speaker right now is Spencer West and I was blessed enough to have him as a facilitator. (Jude)

This adds credibility to the assertion that *Me to We* motivational speakers are akin to celebrities who gain "rock star" status amongst youth (Jefferess, 2012).

Rose demonstrated some emerging criticality, recognizing her minimal community interactions.

We weren't able to communicate, we weren't able to connect with the children...it was more of hearing stories from Free the Children representatives about community members that is how we got to know the community a bit. (Rose)

Megan, the oldest participant who was completing first year postsecondary studies, appeared most critical. Like Rose, she recognized her limited involvement with the host communities and questioned the value of her contributions.

I learned a lot this year...[I question] their role as an organization and our role as volunteers going overseas... It's difficult for them [host community] to have a strong foundation and trust with

people...and then have those people leave all the time... different ways I'm able to use my skills and talents...because I'm not a builder...Like why can't someone from the host country facilitate the trips? I mean they know the country better than somebody who comes from Canada...Free the Children definitely has things that we get to see and we obviously don't get to see the whole picture because we're not living with the family.... I mean it's a little bit idolizing...I was not getting the whole picture. (Megan)

Megan was registered for a university sponsored service-learning experience and was eager to interact with her host family, "I'm going to be having the opportunity to live with a host family and work with a Ghanaian organization". Despite her concerns, Megan believed that voluntourism "inspires a lot of people to starting thinking about development, which is really great".

Concluding Thoughts

We believe that the participants in this study are unique in terms of their engagement in multiple voluntourism ventures, as well as their enhanced understandings of their experiences relative to other youth who elect to participate in voluntourism. Consistent with researchers' assertions (Crabtree, 2008; Dykhuis, 2010; O'Sullivan & Smaller, 2013), participants' voluntourism experiences appeared to promote personal growth, social awareness, and global understandings. Specifically, these young women demonstrated increased interest in international issues as well as emerging understandings of their positions of privilege. They appeared sincere in their commitments to participate in positive global change, demonstrated criticality of media representations, and at times, challenged the misconceptions of their peers. They reported behavioural changes as a function of their experiences and

integrated their commitment to pursue social justice issues as part of their studies.

Nonetheless, these participants were candid about their post-travel transitional difficulties and recognized the importance of reflection for meaning making. Their struggles underscore the call of other researchers for in-depth pre- and post-voluntourism discussions (Epprecht, 2004; Tiessen & Kumar, 2013). We believe that educators are well positioned to facilitate such deliberations, and hold some responsibility to do so whether as part of formal or informal conversations. However, we also acknowledge that not all educators possess extensive understandings about colonialism, privilege, systematic oppression, and marginalization as related to the multiple locations where students may participate in voluntourism activities. Furthermore, we recognize that discussions that problematize voluntourism only (Jefferess, 2012) may negate or diminish the benefits associated with this activity and discourage students from continued involvement. Therefore, we suggest that teacher educators prepare future teachers to engage in balanced critical questioning techniques to support students' meaning making of their voluntourism experiences.

Critical literacy pedagogy is consistent with the objectives of global citizenship in that it is intended to promote individuals' abilities to contemplate implicit as well as explicit messages associated across multiple text mediums (spoken, written, visual, digital) and experiences (Johnson & Vasudevan, 2012; Locke & Cleary, 2011; Wood, Soares & Watson, 2006). As part of critical reflection, students are encouraged to question the everyday, overt and covert power relations, and multiple realities and alternative positions (Lewison & Leland, 2002). The use of critical question prompts is one readily accessible technique that teacher educators can use to prepare future teachers to facilitate thoughtful discussion

and reflection. We encourage educators to use generic prompts such as those developed by Bean and Moni (2003) and McLaughlin and DeVoodg (2004, 2011) when reviewing voluntourism materials and activities.

Who is behind the construction of the text?
 Whose view of the world is advocated?
 What is the historical/cultural origin on the text?
 What social function does the text serve?
 What other positions might there be?
 Who has voice in the text?
 Who does not have voice in the text?
 How might the text be rewritten to give voice to the silenced?

In order to establish a balanced-perspective and promote students' continued, yet informed engagement, we also suggest that teacher educators introduce future teachers to the use of prompts that focus on connectedness, self-awareness and continued learning as advocated by Tiessen and Kumar (2013). We believe that such prompts are especially important in assisting students in processing their voluntourism experiences.

Have I acquired new understandings and skills?
 Have I changed as an individual?
 Have I learned about myself as an individual, as a member of my community and as a global citizen?
 What questions have remained? What new questions have emerged?
 How might I seek out information to address my questions?
 How can I transfer the knowledge and skills that I have acquired?

In the absence of skilled adults guiding and nurturing critical discussions, the participants in this study turned to each other for such support. While participants acknowledged the strength of ongoing relationships with others involved in voluntourism, there is little evidence that they gained critical insights or feedback from their peers. Instead, participants seemed to differ in terms of their emerging criticality, gaining insights over time, through varied experiences and with access to divergent sources of information.

We acknowledge that these participants represent only a subset of youth who engage in voluntourism. However, they do provide educators with critical insights about the potential of voluntourism and the meaning making processes of youth who engage in it. Fortunately, participants' post-travel disequilibrium did not overshadow their overall enthusiasm to take up social justice issues and engage in subsequent voluntourism. Indeed, these participants assumed leadership roles in their schools and actively promoted voluntourism. Presumably participation in structured briefing and debriefing sessions facilitated by educators who have been introduced to critical questioning techniques during their teacher education programs would provide such youth with greater confidence and abilities to assume these roles and interact with their peers in informed and critical manners.

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TEACHING CRITICAL MULTICULTURAL EDUCATION ONLINE AND FACE-TO-FACE: A CROSS-CASE ANALYSIS OF STUDENTS' TRANSFORMATIVE LEARNING

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Abstract: *With the dramatic rise of diversity in American schools, the need to prepare teachers to work with this population, and the increasing popularity of online instruction, teacher educators and researchers need to pay greater attention to the effects of online instruction. This study examines and compares the impact of a critical multicultural education (CME) course on students' learning through two modes of instruction—online and face-to-face. The course was designed in accordance with the key principles of multicultural education and taught in the same semester in a Midwestern university in the US. Thirty-six students participated in the study: 19 students were enrolled in the face-to-face class and 17 in the online module. Analysis drawn from a multiple-case study design indicated no significant difference in students' transformative learning as a result of participating in a face-to-face or online class.*

Keywords: multicultural education, teacher education, transformative learning, online instruction

Introduction

With the dramatic rise of diversity in American schools, universities and colleges across the country have created multicultural teacher education programs to prepare preservice teachers to work effectively with students from different cultural and socioeconomic backgrounds (Grant & Sleeter, 1998; Jenks, Lee, & Kanpol, 2001). Most of these programs, however, tend to focus on “softer forms of multiculturalism” (Reiter & Davis, 2011), which does very little to challenge students' understanding of culture and race (Banks, 2004). The courses are usually designed to train teachers with pragmatic skills and personal awareness instead of preparing them in accordance with the key principles of multicultural education, such as critical consciousness and a commitment to educational equity and social justice (Gorski, 2009). As a result, preservice teachers' attitudes toward diversity tend to remain unchanged (Reiter & Davis, 2011).

Courses that emphasize a more “critical multicultural approach” (Gorski, 2009) to

teacher education often demonstrate positive results on raising students' awareness about race, culture, and discrimination (Sleeter, 2001). Most studies in this area, however, examine traditional courses, where students are physically present in class (Ambe, 2006; Bruna, 2007; McNeal, 2005). Some studies investigate blended/hybrid courses with online components, such as online threaded discussion (Barntmeier, Aragon, & Folkestad, 2011), and a few investigate purely online courses (Akintunde, 2006; Brown, 2010). Comparative studies between online mode of instruction and face-to-face (FTF), however, are not very common in the field of multicultural education. The study presented herein aims to investigate this unexplored area. More specifically, this study examines and compares the impact of a critical multicultural education (CME) course on students' learning through two modes of instruction—online and face-to-face. The

CME course was offered spring 2013 in a Midwestern university in the US. I was the instructor of both classes.

Theoretical Framework

Gorski's (2009) typology of multicultural teacher education (MTE) programs and Mezirow's (1991, 2000) theory of transformative learning informed the theoretical orientation of the CME course as well as the data analysis.

Gorski (2009) defines five approaches to diversity teacher training, each of which falls into one of the three categories: conservative, liberal, and critical MTE. The CME course integrated elements from both liberal and critical MTE. The liberal MTE programs use either a *teaching with cultural sensitivity and tolerance* approach or a *teaching with multicultural competence* approach. The *teaching with cultural sensitivity and tolerance* approach aims to prepare teachers to be tolerant to difference and sensitive to diversity, particularly through an examination of personal biases and prejudices. This approach places great emphasis on self-reflection, respecting human diversity, and celebrating differences. The *teaching with multicultural competence* approach aims to equip teachers with knowledge and practical skills to implement multicultural curricula and pedagogical strategies, enabling them to meet the diverse learning needs of students. The emphasis is on preparing teachers to successfully implement culturally responsive teaching, which is to use the background, knowledge, and experiences of students to inform their lessons and methodology. The critical approach to MTE is defined into two strands: *teaching in sociopolitical context* and *teaching as resistance and counter-hegemonic practice*. The *teaching in sociopolitical context* approach engages teachers in a critical examination of the systemic influences of power, oppression, dominance, and inequity on schooling and

society. The focus of this approach is to critically examine dimensions of systemic oppression (racism, sexism, heterosexism, and so on) and investigate how these dimensions contribute structurally to an unjust and inequitable educational system. The *teaching as resistance and counter-hegemonic practice* approach prepares teachers to be agents of social change and to engage in counter-hegemonic teaching practices and social activism. In this approach, teachers are encouraged to resist, and to prepare their students to resist, systemic oppression by critically examining teaching materials, deconstructing normalcy, and addressing issues of social justice through their curricula and beyond. Both approaches within the critical MTE typology draw on critical theories, postcolonial theories, and social justice education to incite teachers in a critical examination of systemic oppression. According to scholars in the field, the critical MTE is "the only variation of MTE which has potential to attempt any meaningful sociopolitical change that could promote equity in education (Reiter & Davis, 2011, p. 44).

The course examined in this study integrated the four approaches described above. The objective of this course was to scaffold students through each stage in order to prepare them to be agents of social change and engage in counter-hegemonic teaching practices. As Gorski (2009) argued, "the values and skills promoted in each of these approaches are important to a holistic MTE" (p. 316). Effective teachers need pragmatic and pedagogical strategies to be multiculturally competent (Constantine & Sue, 2007; Sleeter, 2005). They need to be aware of their own biases and prejudices (Boyle-Baise, 2005), and they need to learn to critically examine the systems of oppression and inequity in society and schooling before they can become agents in social change and engage in social justice.

In addition to Gorski's (2009) typology of MTE programs, this study also draws on Mezirow's (1991, 2000) theory of transformative learning. According to Mezirow (2012), "Learning occurs in one of four ways: by elaborating existing frames of reference, by learning new frames of reference, by transforming points of view, or by transforming habits of mind" (p. 84). Frames of reference are structures of assumptions and expectations that frame our points of view and influence our thinking, beliefs, and actions. Frames of reference may be within or outside of our awareness.

Our values and sense of self are anchored in our frames of reference. They provide us with a sense of stability, coherence, community, and identity. Consequently they are often emotionally charged and strongly defended....Who we are and what we value are closely associated. (Mezirow, p. 84)

For transformative learning to occur, we need to engage in critical self-reflection of our taken-for-granted frames of reference. It is often a threatening emotional experience because we have to become aware of our assumptions and their supported ideologies. It has both individual and social dimensions and implications because it demands that we become aware of how we developed our knowledge and the values that lead us to our perspectives. In transformative learning "we transform our taken-for-granted frames of reference (meaning perspective, habits of mind, mind-sets) to make them more inclusive, discriminating, open, emotionally capable of change, and reflective" (Mezirow, 2012, p. 76). Transformative learning may occur through objective or subjective reframing. *Objective reframing* involves critical reflection of an object of study, on what is communicated to us. *Subjective reframing* involves critical self-reflection of one's own assumptions and it is often the most

threatening, "as old perspectives become challenged and transformed" (p. 87).

Another approach to transformative learning, which is of particular interest to this study, is "critical transformative learning" (Brookfield, 2012; Lange, 2004). Critical transformative learning seeks to "foster an individual's consciousness of himself or herself as situated within larger political and economic forces" (Lange, 2004, p. 122). It requires one to realize that personal identity is not a self-contained individual choice but is "shaped by collectively generated and maintained roles, assumptions, images, and expectations associated with one's race, class, or gender" (Brookfield, 2012, p. 139). From a critical theory standpoint, transformative learning is equivalent to recognizing and challenging power dynamics and dominant ideology. The intent of critical transformative learning is not just personal transformation but societal transformation (Lange, 2004).

The approach to MTE adopted in the CME course aimed to promote both transformative and critical transformative learning. Participants were challenged to reflect on their own biases and assumptions (*subjective reframing/transformational learning*), re-evaluate their cultural identity (*subjective reframing/critical transformational learning*), examine their own white privilege (*subjective reframing/critical transformational learning*), explore and examine the practices of multicultural education (*objective reframing/transformational learning*), analyze the sociopolitical context of schooling and society (*objective reframing/critical transformational learning*), evaluate the instructional and curricular hegemonic practices in education (*objective reframing/critical transformational learning*), and think of ways of engaging in counter-hegemonic

teaching and social justice (*critical transformative learning*).

Course Content and Pedagogy

Course content for both online and FTF classes was organized around topics, such as multicultural education theory, culture and education, race and identity, gender and homophobia, inequality in education, teacher expectation, engaging families, multicultural education practices. Both classes progressed synchronically; students were assigned the same set of readings and videos according to the topic of the week and required to submit the same assignments. The only difference in content between the two classes was in the delivery of the final group project. Students from the FTF class presented their group project in class at the end of the semester; whereas, the online students submitted a final paper describing the project.

Pedagogy for each class differed considerably. Although both classes were centered on group discussions, they differed in its structure and quality. The online students participated in small-group discussions through online threaded discussions. I strategically assigned them to different groups every week based on my observation of their frames of reference (Mezirow, 2012) and disposition to multicultural issues. My goal was to challenge students' frames of reference, so I mixed students who displayed greater resistance to multicultural education with those who were more open and committed to multicultural issues. I only participated in the discussion at the end of the week to clarify points of doubt or confusion. Occasionally I challenged them in their assumptions and perceptions. The FTF class met once week for a three-hour period. Students participated in small- and large-group discussions, drama activities, drawing, collage, and individual self-reflection activities.

My Role as Instructor

As the course instructor, I was in control of shaping the course content as well as the teaching and learning environment (Taylor, Tisdell, & Hanley, 2000). My theoretical orientation and epistemological beliefs informed my curricular choices and my teaching. Like critical theorists, I believe reality is known through the study of social structures, power, dominance and control (Foucault, 1980; Freire, 2000). However, like transformative theorists (Mezirow, 2012; Taylor & Cranton, 2012), I believe social change is dependent on personal transformation. Hence, I was very strategic with the selection of course materials and the order and manner in which to present them. I also placed reflection at the center of all activities proposed. For the online class, reflection was embedded in the questions proposed for discussion.

My background and experiences also played a role in how I shaped the learning environment in my classes, particularly in the FTF class. As an "alien" resident in the US, I am very sensitive to how I conduct discussions about the inequities in the American schooling system and society. Although I have lived and worked in the US for over a decade, and experienced the struggles faced by minority groups as a Brazilian citizen, I still feel like an outsider with reduced authority to denounce inequities in a country that I am not a citizen. I, therefore, tend to take a more subdued role and act as a facilitator in my classes. Nonetheless, despite my subdued role, I still believed that my teaching strategies and direct contact with students would play an important role in students' transformative learning. This was the first time I taught an online class and I must admit I was bias against it. I truly thought that the online students would not reach the same level of transformation as the FTF students because of the nature of distance education.

Method

Design and Data

This study used a multiple-case study design. A case study approach was used to allow in-depth analysis of students' responses to the CME course (Yin, 2009). The design involved two case studies—the online and FTF class, and a cross-case analysis. The research questions guiding this study were the following:

1. Has the CME course had any impact on students' transformative learning?
2. What changes in transformative learning did students experience as a result of participating in a CME course?
3. Was there any difference in transformative learning experienced by students as a result of participating in the online or FTF class?

Data collected for this study included students' questionnaire, assignments (response papers and final group project), self-reflection paper, discussion forum (for online students only), and instructor observation notes. All students were asked in the first day of class to respond to a questionnaire about their cultural background and their experience with diversity and multicultural education (see Appendix B). At the end of the course, students were asked to write a self-reflection paper on changes they experienced as a result of participating in the course. Both courses started and ended on the same week. The FTF class included 14 weekly classes, each of three hours of duration over one semester. The online group participated in 13 weekly online forum discussions.

Participants

Thirty-six students participated in the study: 19 students were enrolled in the FTF class and 17 in the online module. The FTF class included four teachers, 12

preservice student teachers, and three students seeking a degree outside teaching. The online module included five teachers, 10 preservice student teachers, and two students seeking a degree other than teaching. The FTF group had one Native American and one deaf student, and the online group had an Arab-Muslim student. The remainder students were all European Americans.

Both groups shared similar academic experience with regards to diversity but differed in their personal experience with it. A similar number of students in both classes had taken 2+ courses in multiculturalism prior to this class. However, a greater number of FTF students (nine FTF against five online students) reported having had significant experience with diversity prior to this class. With respect to students' disposition to multicultural education, ten FTF students exhibited favorable disposition to multicultural education propositions in the beginning of the course; whereas, only four online students exhibited similar disposition.

Analysis

Data were analyzed qualitatively on several levels. To answer questions 1 and 2, I examined students' responses individually. I looked at students' disposition at the beginning of the course (Brown, 2004), their academic and personal experience with diversity, their focus of reflection throughout the course, intention of engagement in social action and culturally responsive teaching, and the changes they experienced as a result of participating in the course. To answer question 3, I aggregated students' individual responses from each group and performed a comparative analysis between the two groups.

Data were coded inductively, however, they were informed by Gorski's (2009)

typology for evaluating approaches to MTE programs and Mezirow's (1991, 2000) theory of transformative learning. A set of categories based on these two theoretical approaches was initially established for coding. As new patterns emerged, new categories were created (Gall, Gall, & Borg, 2003). Once I finished coding the data from the FTF class, I revised the categories, collapsed them into appropriate themes, and revised the entire coding for accuracy. For the online group, I aggregated the data into the categories already established (Creswell, 2013). Only one additional category was added. The online forum discussion was coded separately since the FTF class had no equivalent data. Finally, I determined frequencies and percentages of students' responses to look for trends in individual and group learning. All data was coded and analyzed with NVivo, a computer software program appropriate for qualitative data analysis. Coding included over 18,000 references across the two groups.

Findings

Analysis of the data resulted in 18 categories collapsed into four main themes: (a) disposition to multicultural education propositions; (b) learning related to cultural identity, bias, assumptions, discrimination, and prejudices—*teaching with cultural sensitivity*; (c) learning related to the implementation of culturally responsive teaching—*teaching with multicultural competence*; (d) learning related to power, dominance, inequity, injustice, and oppression in schools and society—*teaching for social justice*. A detailed chart with the categories and themes can be found in Appendix A.

Has the CME course had any impact on students' transformative learning?

Data analysis suggested that the CME course contributed to students'

transformative learning. Thirty-three out of 36 students indicated that they had experienced perspective transformation as a result of participating in the course. As discussed earlier, transformative learning occurs when we engage in critical reflection and self-reflection and re-evaluate (transform) our assumptions and frames of references (perspectives) "to make them more inclusive, discriminating, open, emotionally capable of change, and reflective" (Mezirow, 2012, p. 76). Changes in frames of reference varied across individual students. Most students (24) reported several changes in their frames of reference at the end of the course; whereas, a smaller number (9) reported fewer changes (more details on the changes in frames of reference is provided below). The three students who reported no changes in their frames of reference at the end of the semester demonstrated strong resistance and disagreement to most multicultural propositions from beginning until the end of the course.

What changes in transformative learning did students experience as a result of participating in a CME course?

Changes in frames of reference across students were mostly related to culturally sensitive and social justice issues. Forty percent of the statements reported in the final self-reflection paper addressed changes related to cultural identity, biases, assumptions, prejudices, stereotypes, and discrimination (*teaching with cultural sensitivity*), and 40% reflected changes in knowledge and assumptions with regards to issues of power, dominance, white privilege, inequity, injustice, and oppression in schools and society (*teaching for social justice*). Twenty percent of the statements reflected changes in understanding related to multicultural education theory and practice (*teaching with multicultural competence*). The excerpts below illustrate some of the

changes in frames of reference reported in the self-reflection paper:

This term has opened my eyes in several ways. First, I am more aware of the biased culture that I was raised in and the benefits I receive from it just because of my race. I have also learned new ways to combat such prejudices and avoid being disconnected from my students' cultures (teaching with cultural sensitivity).

I had been exposed to race issues in schools before through other classes, but this class really made me see how serious and wide spread the issues are. I knew that segregation was happening in some districts because of housing and city plans, but I did not realize how much disparity there was between the different schools. I also did not realize how wide spread this problem is in the U.S. Being aware of the problem is one of the first steps to being able to help do something about it. I appreciate that this class helped make me more aware (teaching for social justice).

This course has provided me with a deeper understanding of my beliefs, privilege, and my culture. I was encouraged to be inquisitive about the ways that I think and conduct myself. I often attribute my personality and ways of being and thinking to the way I was raised. Although it is easy to place a cause and effect relationship on my present person and my childhood, I have been challenged to evaluate my beliefs beyond the influence of my childhood (teaching with cultural sensitivity).

In addition to changes in frames of reference, 30 students demonstrated engagement or intention of engagement in practices related to social justice. Engagement in social justice can take

many forms and be enacted at several levels (Johnson, Oppenheim, & Suh, 2009). It may vary from a simple disposition to act differently according to one's new perceptions of power and oppression to actively engage in social activism in the public arena. Most of the students in the course were preservice teachers unfamiliar with issues of social justice presented in the course. Thus, their level of engagement or intention of engagement in practices related to social justice was commensurate with their experiences and level of comfort. Some students demonstrated more concern with issues of power, inequity, and oppression, and counter-hegemonic teaching, whereas others seemed to pay greater attention to issues related to prejudice and discrimination in schools and society. The quotes below illustrate some forms of engagement in practices related to social justice:

Inclusion is so important in America and, yet so many cultures and people are excluded because of the culture that I identify with. I now actively think about white privilege and try to address my actions differently.

I have already found that in my lessons, I am doing whatever I can to present multiple points of view. This is what these students need the most and what I am going to focus on as a teacher. Most likely, I will be teaching on a Native American reservation. This alone presents some unique challenges as a Non-Native individual. However, I am now better equipped to see things from multiple viewpoints. This is important, because in order to be a multicultural teacher, you have to be a multicultural person. Then, you have to model it accordingly.

I used to assume that teachers taught differently because of individual differences and not necessarily

because of cultural or class differences. Through this class I realized that some of the styles and phrases I used were because of my race and class. This helped me realize that I need to change those so that students from other classes and/or races have access to what I was wanting. I have a full time aide in my room and she is African American. After we read about giving direct instructions verse vague suggestions, I started listening to how she interacted with the students. I found that she did use more specific language than I did. I have started using more specific language and I have seen a difference in the behaviors of my students.

With regards to students' focus of discussion and reflection throughout the course—one of the key factors in students' transformative learning (Mezirow, 2012), data suggest that students were mostly interested in topics concerning social justice and culturally sensitive issues. Among the 33 students who reported changes in their frames of reference, 17 focused their reflection and discussion mostly on the sociopolitical context of school and society, white privilege, and hegemonic teaching; six concentrated on culturally sensitive issues (cultural identity, biases, assumptions, prejudices, stereotypes, and discrimination); and six focused on both strands of topics. Below is an excerpt from an online threaded discussion that illustrates students' focus of discussion and reflection:

I could sit here and argue that my teachers did not discuss harassment or LGBTQ issues enough in class or provide positive examples of the culture and in truth, those things probably are partly to blame. But in reality, it was fear that kept me from doing those things that I knew was right. Fear of losing the power of "normal."

Coming to grips with these feelings helps me to understand why my students and why the students in the video might stand by and not say or do anything when bullying takes place. It doesn't validate it by any means but it does help begin a conversation about it and how to erase that fear. All teachers, no matter new or experienced, must work together to provide safe environments for all students, no matter their own personal beliefs (examines the sociopolitical context of school and society and reflects on social justice).

Finally, data analysis suggests that prior academic and personal experience with diversity may be a factor in students' transformative learning concerning multicultural and social justice issues. Of the 24 students who reported several changes in their frames of reference, 11 had limited academic and personal experience with diversity and 8 had either limited academic experience or limited personal experience with diversity. Conversely, three of the students who displayed fewer changes in frames of reference reported extensive academic and personal experience with diversity.

Was there any difference in transformative learning experienced by students as a result of participating in the online or FTF class?

Data analysis indicates no significant difference in transformative learning between students who participated in the online class and those who took the FTF class. Similar number of students in both classes, 13 FTF students (68%) and 11 online students (64%) reported several changes in their frames of reference at the end of the course. Among the students who reported fewer or no changes in frames of reference, six were in the FTF class and six were in the online class.

Changes in frames of reference across the two groups were very similar and mostly related to culturally sensitive and social justice issues. Data from the final self-reflection paper show that 39% of the statements reported by the FTF students and 43% reported by the online group reflected changes in knowledge and assumptions with regards to issues of power, dominance, white privilege, inequity, injustice, and oppression in schools and society. Similarly, 39 % of the statements from the FTF students and 41% from the online group addressed changes related to cultural identity, biases, assumptions, prejudices, stereotypes, and discrimination. Only 22% of the statements from the FTF students and 16% from the online group reflected changes in understanding related to multicultural education theory and practice.

Students' engagement or intention of engagement in practices related to social justice shows slight variation between the two groups. Although the same number of students in both classes, 15 FTF students (79%) and 15 online students (88%), demonstrated signs of engagement in this area, there was variation in the topics chosen for the practice of social justice. Eleven FTF students (58%) reported having engaged or intention to engage in social action related to issues of power, inequity, and oppression, and/or counter-hegemonic teaching in comparison to eight online students (47%). Conversely, seven online students (41%) stated having engaged or intention to engage in action that addresses prejudice, bias, stereotyping, and discrimination in schools and society in comparison to four FTF students (21%).

In regards to students' focus of discussion and reflection, data analysis also indicates slight variation between the two groups. Although most students from both classes, 16 FTF students (84%) and 15 online students (88%), concentrated their

reflection and discussion on topics concerning culturally sensitive and social justice issues, the focus of interest varied across the groups. Thirteen FTF students (68%) focused their reflection and discussion mostly on the sociopolitical context of school and society, white privilege, and hegemonic teaching in comparison to nine online students (53%). Conversely, five online students (29%) concentrated their reflection and discussion mostly on culturally sensitive issues related to cultural identity, biases, assumptions, prejudices, stereotypes, and discrimination in comparison to two FTF students (11%). One FTF and one online student concentrated their reflection and discussion on both strands of topics. The remainder students, three FTF and two online, focused their discussion on either multicultural competence or a combination of multicultural competence and culturally sensitive issues.

Data collected from students' final project indicate a reverse trend in students' transformative learning across the two groups. The topics selected by the online class for the final project were mostly related to social justice issues and counter-hegemonic teaching while the topics selected by the FTF class were mainly related to culturally relevant teaching. Forty-nine percent of the statements in the online group projects referred to social justice issues and counter-hegemonic teaching while only 22% of the statements in the FTF group projects addressed similar topics. Conversely, 59% of the statements in the FTF group projects reflected culturally relevant teaching while only 23% of the statements in the online projects were coded in this category. Finally, 28% of the statements in the online projects referred to culturally sensitive issues in comparison to 19% of the statements coded in the FTF projects.

Finally, data suggest that the online group could express more openly and freely their

resistance to multicultural education arguments and propositions than their FTF counterparts. Fourteen online students (82%) expressed resistance to multicultural education arguments and propositions while 10 FTF students (53%) expressed similar resistance. Both groups expressed resistance to multicultural education arguments and propositions and to accepting white privilege and/or racism. Only the online group expressed resistance to multicultural education by “blaming parents for problems in education.”

Discussion

Overall, the findings across the two groups were very similar. Despite the differences in the delivery format and each group’s composition—the FTF group had more personal experience with diversity and appeared more favorable to multicultural education propositions in the beginning of the course than the online group—students from both groups experienced similar transformational learning as a result of participating in this course. Although the three students who reported no changes in frames of reference belonged to the online group, I question whether there would be any difference if those students were in the FTF class. These students displayed the same disposition from beginning until the end of the course. They started the course with their fixed beliefs, resisted most multicultural propositions presented in the course, and ended the semester with, apparently, the same beliefs.

Both groups reported changes in frames of reference in equivalent categories. Frames of reference are structures of assumptions and expectations that frame our points of view and influence our thinking, beliefs, and actions (Mezirow, 2012). The majority of changes in frames of references reported by both groups were related to issues of power, dominance, white privilege, inequity, injustice, oppression, cultural identity, biases, assumptions, prejudices,

stereotypes, and discrimination. Less than a quarter of the statements reported by the two groups addressed changes related to multicultural competence. These findings reflect the content of the course materials, where greater emphasis was placed on culturally sensitive and social justice issues.

Students’ focus of discussion and reflection across both classes was also similar. Reflection is an important indicator of transformational learning. In fact for transformative learning to occur, one needs to engage in reflection. As Mezirow (2012) argues, the transformative learning process emerges through critical reflection on what is communicated to us, and critical self-reflection of our taken-for-granted frames of reference. Students across both groups focused their discussion and reflection mostly on culturally sensitive and social justice issues. The FTF class concentrated more on topics related to social justice while the online group focused their attention mostly on culturally sensitive issues. However, for the final project, the online class demonstrated greater attention to issues of social justice while the FTF group focused mostly on culturally relevant teaching. The FTF final project was a surprise, considering the attention to social justice displayed by this group throughout the semester.

With regards to engagement in social justice and counter-hegemonic teaching, the two groups again displayed an analogous pattern. Preparing teachers to be agents for social justice is key in critical multicultural education (Gorsky, 2009). Both groups demonstrated signs of engagement in the practices of social justice, although once again, the FTF class showed greater concern with matters related to inequity, oppression, and hegemonic practices in school and society, whereas the online group split their attention between these issues and

problems related to prejudice, bias, stereotyping, and discrimination.

The similar findings between the two groups came as a great surprise to me. As mentioned earlier, I had some bias against online teaching and believed that my presence in the classroom and my teaching strategies would have some weight on students' transformative learning. The unexpected findings of this study prompted me to reflect on what *might* have facilitated students' transformative learning across both classes. Although it is not possible to know precisely what have contributed to it (as this was not the purpose of this study), we can examine a few factors that might have facilitated the process.

Limited experience with diversity may have contributed to students' transformative learning since students are more prone to experience change in learning when exposed to information that is new to them. The choice of course materials and the emphasis placed on reflection and self-reflection in both classes may also have had significant impact in the transformational learning process. The quotes below illustrate this point:

When I began this course, I already considered myself a pretty multicultural person. Growing up in a multiracial family, on a Native American reservation, and with the guidance of a particularly open- and equality-minded mother has greatly contributed to my own tendency toward acceptance of diversity. In spite all of this, I am extremely impressed at the ways this course has broadened my awareness of multicultural issues. The emphasis on self-reflection is something I have really absorbed from this class, and I hope to make this a large part of my teaching process, and even my general living process.

Reading this week's articles and watching this week's video was a really great experience for me and altered my view of Native Americans and their role in education and how they learn differently. Growing up and working on a reservation I think it was/is really difficult to completely consider all the factors that play into the dynamics of family life and education on the reservation. We often thought that so much was given to the natives and that they are being repaid for something that happened a long time ago, however, these readings and the boarding school video really opened my eyes again to the struggles they endured and continue to endure.

A third factor that might have contributed to students' transformative learning was the emphasis on group discussion in this course. Students in both classes were required to discuss the course materials in small groups every week. For the online class, I strategically placed the students in the forum group discussions according to my observation of their frames of reference and disposition to multicultural education, so that students who were more open and committed to multicultural issues could challenge those with more resistance and less experience in multiculturalism.

My role as instructor might have also influenced students' transformative learning. As mentioned earlier, I took the role of facilitator in both classes. In the FTF class, I was very careful in how I framed my position about the topics; I also tried to create a non-threatening environment so that students would feel encouraged to express their thoughts and points of view. In the online class, my role was as more distant as I did not interfere in their weekly forum group discussion, waiting till the end of the week to post my comments. Nonetheless, despite my "non-intrusive" role, I was very active and deliberate in designing the course activities

and questions for both classes to prompt students to reflect on specific topics.

The last but not least factor that might have facilitated the transformational learning among online students is the less threatening environment. Online communication encourages students to express their views more freely because of the absence of physical contact with the instructor and their colleagues (Barntmeier et al., 2011). As stated earlier, the online group expressed much more openly their resistance to multicultural education than the FTF group. In addition to the absence of physical contact, online students have more time to reflect and respond to their colleagues' posts. If they feel challenged or threatened by a comment, they can

choose to ignore it or they can address it later after reflecting upon it.

Concluding Remarks

The findings of this study are encouraging, considering the increasing popularity of online instruction in recent years. Although the findings cannot be generalized because of the relative small number of participants, this study sheds light on the potential of teaching critical multicultural education online. With the dramatic rise of diversity in American schools, the need to prepare teachers to work with this population, and the increasing popularity of online instruction, teacher educators and researchers need to pay greater attention to the effects of online instruction.

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Appendix A

EMERGED CATEGORIES INFORMED BY GORSKI'S (2009) TYPOLOGY AND MARIZOW'S (2000) THEORY OF TRANSFORMATIVE LEARNING		
DISPOSITION TO MULTICULTURAL EDUCATION PROPOSITIONS		Favorable frames of reference to MTE at the beginning of the course
		Concerns about implementing MTE
		Resistance to MTE arguments and propositions
		Resistance to accepting white privilege
APPROACH	COURSE OBJECTIVES	TRANSFORMATIVE LEARNING
TEACHING WITH CULTURAL SENSITIVITY	Examination of culture, identity, personal biases, assumptions, stereotypes, and prejudices.	Reflects cultural identity (race, SES, gender, ethnicity, religion).
		Identifies and reflects on biases, assumptions, beliefs, prejudices, stereotypes, and discrimination (self and others)
		Examines ways to: 1) address biases, assumptions, beliefs, prejudices, stereotypes, and discrimination in schools and society; 2) become more culturally sensitive.
		Engages or intends to engage in action that addresses biases, assumptions, beliefs, prejudices, stereotypes, and discrimination in schools and society
		Reflects on own learning as it relates to identity, culture, biases, assumptions, beliefs, prejudices, stereotypes, and discrimination.
TEACHING WITH MULTICULTURAL COMPETENCE	Equip teachers w/ knowledge and practical skills to critically evaluate and implement MTE, as it relates to culturally responsive teaching.	Reflects and critically evaluate existing educational practices
		Reflects on culturally responsive teaching and/or examines possibilities for implementing it
		Implements or intends to implement culturally responsive teaching.
		Reflects on own learning as it relates to multicultural education/multicultural competence.
TEACHING FOR SOCIAL JUSTICE	Provide teachers with tools to critically examine influences of power, dominance, inequity, and injustice on schooling and society. <i>(Teaching in sociopolitical context)</i> . Prepare teachers to be agents in social change and engage in counter-hegemonic teaching and social justice. <i>(Teaching as resistance and counter-hegemonic practices)</i>	Recognizes, identifies, and reflects on the issues of power, dominance, inequity, injustice, and oppression in schools and society. Realizes that curriculum and pedagogy are shaped by dominant ideologies.
		Recognizes and reflects on white privilege and other forms of privilege.
		Reflects on critical multicultural education and/or examines possibilities for change in education and society
		Engages or intends to engage in counter-hegemonic teaching and/or social justice.
		Reflects on own learning: <ul style="list-style-type: none"> • Power, dominance, inequity, injustice, and oppression in schools and society. • White privilege

Appendix B - Student Questionnaire/Lucila Rudge

Name: _____

1. Which degree program (undergraduate or graduate) are you enrolled and what is your certification area?
2. Are you currently teaching, or have you taught before?
3. Please share about your history and cultural background (ethnicity, family, region where you grew up, religion, values, etc.).
4. Have you taken any courses on multicultural education, diversity awareness, inclusion, or similar topics before? When?
5. Please share any experiences you have had with cultural diversity either in your personal or professional life.
6. Has the above experience had any impact in your knowledge and understanding of cultural diversity?

PORTFOLIO TRAINING: GETTING LEARNERS ACTIVELY INVOLVED

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Abstract: *This article aims at helping teachers make effective use of language portfolios in an EFL/ESL context. This is through proposing and making clear the steps of integrating them into their teaching and the way learners' training into their use needs to be conducted to promote their reflective and autonomous learning. These range from identifying the students' readiness to autonomous learning to teachers' assessment of students' portfolios and their evaluation of this process. It is worth noting here that, this training process is being carried out on a sample of undergraduate students at the department of English of Abdelhamid Ibn Badis University of Mostaganem, Algeria.*

Key words: language portfolios, EFL/ESL, autonomous learning

Introduction

The last decade has witnessed an array of changes in language learning goals, requirements as well as perspectives. The prevailing tendency is to teach learners how to learn in order to enable them to cope with new technologies and learning environments. Indeed, assessment of learners needs to contribute to their learning instead of merely providing data on their accomplishment or learning outcomes. Therefore, a variety of assessment methods or what has been called alternative assessments has been advocated. Language portfolios are among these methods which are gaining more popularity and support among teachers, teacher-trainers, learners, stakeholders, material designers, educational boards, and researchers (Mitchell, 1992). They can provide opportunities for learners' involvement and reflection over their learning, thus promoting their autonomous learning. To develop learners' autonomy, conscious awareness of portfolios' use is an important key for the achievement of this process because it involves decision making and taking. Hence, implementing language portfolios requires training learners about its process. To clarify more what constitutes this training, this paper

suggests a portfolio training model which a sample of undergraduate students has been undertaking within an EFL context. Before describing its stages, I have attempted first to account for the concept of learner autonomy, learner portfolio, and its importance in language learning.

Definition of Learner Autonomy

In the field of political philosophy, the notion of personal autonomy has always been regarded as a basic human right because it refers to "the freedom and ability to shape our lives" (Young, 1986, p. 81). Hence, in learning and educational settings, autonomy has been equated with different meanings. This concept was first introduced into the language teaching in the late 1960s through the adult education movement in Europe and North America. Within this movement, Holec (1981), who piloted many autonomous language learning projects, provided the first definition of autonomy. In his terms, autonomy is "the ability to take charge of one's own learning" (Holec, 1981, p. 3). Several researchers have displayed their consensus upon this definition. For instance, Benson (2001) described autonomy as "the capacity to control one's own learning" (p. 7). Similarly, Aoki

(1999) broadened this definition into “a capacity to take control of one’s own learning in the service of one’s perceived needs and aspirations” (p. 4).

However, if this autonomy is considered as a capacity or ability, there is a need to account for what constitutes this ability in order to figure out how taking charge of one’s learning can be implemented. According to Little (1991) autonomy is a “capacity for detachment, critical reflection, decision making and independent action” (p. 40). It follows that autonomous learners are able to reflect on their learning, take decision over their learning, and depend on themselves to improve it. Indeed, Holec (1980) made clear such a decision process which a learner may involve in. According to him being able to control one’s learning means:

1. Determining the objectives.
2. Defining the contents and progressions.
3. Selecting methods and techniques to be used.
4. Monitoring the procedure of acquisition (rhythm, time, place) and evaluating what has been acquired. (Holec, 1980, p. 4)

Hence, for other views this capacity does not only imply a decision making process where learners are responsible for their learning, but it can be extended to include “an attitude to learning where the learner is prepared to take or does take responsibility for his own learning” (Dickinson, 1992, p. 330). To clarify this type of attitude, Dickinson (1993) identifies five characteristics of autonomous learners as follows:

1. They are able to identify what has been taught, i.e., what a teacher is doing and why he/she is doing that.
2. They set their own learning goals in collaboration with their teacher.
3. They have a rich repertoire of strategies and the confidence to select

and implement those that are effective to their learning

4. They can monitor their own use of learning strategies.

Thus, autonomous learners’ attitudes differ from the traditional mode of learning where learners depend entirely on their teacher, while their initiation, reflection and creativity in learning become stunted. Within this conception, learning is not a matter of memorization, “it is a constructive process that involves actively seeking meaning from events” (Candy, 1991, p. 271).

Nevertheless, a question which may be raised is whether this capacity or attitude to control one’s learning is natural or can be acquired. According to Holec (1981), Little (1999), and Littlewood (1996), autonomy is an ability which is not inborn but has to be acquired mostly by formal learning where learners are provided with the necessary tools which may help develop their autonomy. On the other hand, Benson (2003) opposed this view and claimed that autonomy cannot be taught but fostered in the classroom. Therefore, the question which needs to be addressed is not how to produce autonomous learners but rather how to build upon the autonomy which they already have (Benson, 2003). To provide more support for this claim, Aoki (1999) stated that “the core of learner autonomy is a psychological construct” (p. 144) between the learners’ feelings and their learning context. Indeed, the learners’ possession of knowledge and skills does not necessary pave the way to autonomous learning if they are not provided with a context which supports their feelings of autonomy. Thus, learners with regards to their possession of the necessary knowledge and skills need to feel motivated and self-efficacious to use such skills and knowledge effectively. As matter of fact, autonomy is not only a matter of skills and knowledge but it also

depends on learners' willingness and confidence to engage in its process as Littlewood (1996) noted

We can define an autonomous person as one who has an independent capacity to make and carry out the choices which govern his/her actions. This capacity depends on two main components: ability and willingness....ability depends on possessing both knowledge about the alternatives from which choices have to be made and the necessary skills for carrying out whatever choices seem most appropriate. Willingness depends on having both the motivation and the confidence to take responsibility for the choices required. (p. 428)

Thus, one accepts that autonomy can be fostered because it involves affective factors related to learning such as motivation, self-efficacy, etc. Meanwhile, possessing the necessary skills and knowledge to act independently in learning is deemed important to develop one's autonomy because the latter requires learners to build up a skill set that allows them to control their own learning (Reinders & Balcikanli, 2011). Accordingly, to train learners into such a process, teachers need to develop such skills and knowledge while handling with care affective factors within this process. To achieve this objective, effective tools need to be implemented among them language portfolios.

Learners' Language Portfolios: Rationality behind Their Use

Gillespie, Ford, Gillespie, and Leavell (1996) defined portfolios as "a purposeful, multidimensional process of collecting evidence that illustrates a student's accomplishments, efforts, and progress (utilizing a variety of authentic evidence) overtime" (p. 487). Indeed, portfolio is a collection of students' work (e. g, notes,

writing projects, audio-video recording, etc.) which reflects their development, achievement, interest, and motivation in a form of notebooks, box files, loose-leaf binders, scrapbooks (Read-Dickins & Gardner, 2000). Moreover, Collins (1992) described portfolio as "a container of collected evidence with a purpose. Evidence is documentation that can be used by one person or group of persons to infer another person's knowledge, skill, and/or disposition" (p. 452). Yet, portfolios can serve different purposes and defining them depends on their purpose and contents. They can be used to show growth over time (Cameron, Politano, MacNaughton, & Tate, 1997), to provide assessment of information that guides instructional decision-making (Gillespie et al., 1996), to show progress towards curriculum standards (Biggs, 1995), and/or to gather quantitative information for the purposes of assessment outside the classroom (Fritz, 2001).

Students' portfolios have been used as a powerful instrument for formative assessment or for assessment for learning and advocated by many researchers (e.g. De Fina, 1992; Micklo, 1997). Their flexibility and the in-depth involvement of students and choices these tools offer make students more likely to develop ownership and autonomy over their learning. Also, it has been shown that classrooms where portfolio assessment plays an important role are more student-centered, collaborative, and holistic than classrooms which has relied only on tests or more conventional forms of assessment (Genesee & Upshur, 1996).

In fact, research has shown that portfolios provide excellent opportunities for students' self-assessment (Genesee & Upshur, 1996) because they can be used to monitor their progress and make judgments about their own learning process (Julius, 2000). Indeed, portfolio development "provides not only a means

for internalizing learning at deeper level, but also a means for developing and/or refining higher order thinking skills” (Jones & Shelton, 2011, p. 25). Portfolios’ construction involves skills such as awareness of audience, awareness of personal learning needs, understanding of criteria of quality, the way in which quality is revealed, and the development of the skills necessary for the task completion (Yancey & Weiser, 1997).

Furthermore, when using portfolios an on-going feedback is provided where students are accompanied by criteria that describe their growth overtime and indicate what is required from them to achieve success. When students use criteria in the form of a rubric in which they describe their progress towards achievement, they are more able to assess and monitor their own learning and thus identify strengths and areas which need improvement (Joslin, 2002). On the other hand, when using scores alone, students who did not perform well remain unable to find how to improve their performance in the future (Joslin). In fact, using rubrics and assessing continuously one’s learning involves students’ talk about what needs to be improved, what was done well, and how they need to perform a given assignment.

Using portfolios as a self-assessment tool supports learning because it is not limiting feedback but rather increasing descriptive feedback and making it available to students. In doing so, it is also supporting teaching because it provides teachers with information on their students’ process of learning (i.e., their difficulties, needs, learning views and styles) as well as their teaching process (i.e., to what extent is it effective or not?). In this respect, Mullin (1998) stressed that portfolios provide teachers a new perspective in education because they can answer questions like: what kind of troubles do students have? Which activities are more effective or ineffective? What subjects are understood

and not understood? How efficient is the teaching process?

Despite such benefits, training learners about portfolios development remains crucial for achieving their objectives, mainly with learners who have never used them before. As Little (1999) points out, students do not become autonomous learners simply by being told that they are now in charge of their learning. Rather, they need to be trained in this process through using portfolios continuously along with their learning.

Training Students into Language Portfolios: The Process

Before implementing language portfolios there is need to clarify first the portfolio type, purpose, and expected audience. The language portfolio suggested within this context is a learning portfolio which intends to help students ‘learn how to learn’ through involving them in making and taking decisions over their learning process, assessing this process, and reflecting continuously over their progress as well as their learning needs and goals. This portfolio has been adapted from the European Language Portfolio, which contains three sections: the language biography, dossier, and passport). It covers two functions: reporting (a form of alternative assessment) and pedagogical functions (a reflective tool). It is a learning tool as well as a reflective tool, which aims at developing students’ autonomy in studying English as a foreign language. The developed students’ portfolios are to be assessed by the teacher who is the main audience. They will be also viewed by other students and teachers within the same university and may be viewed by their parents.

This language portfolio is integrated into the written expression course, and it concerns three existing groups of first year undergraduate students at the department

of English of Abdelhamid Ibn Badis University of Mostaganem, Algeria. These subjects have been selected for this experiment because the researcher aims at making portfolios' development a life-long experience which starts during their first year and persists along their studies at university, and can be extended well into their future profession. In addition to the intention of achieving such a long term goal, the portfolio process requires students' motivation and involvement in the process. Being enrolled in the first year, students are more likely to be motivated in studying the English language. Their beliefs and attitudes towards learning are more likely to be shaped by the teacher because they know a little or nothing about the university learning environment. As a result, resistance to engage in this process is unlikely to emerge.

The process of training these students about portfolio development involved the following stages:

1. Identifying the subjects' readiness for autonomous learning.
2. Raising their awareness of autonomous learning.
3. Introducing the portfolio content.
4. Checking how the subjects are proceeding with their use and providing continuous feedback.
5. Assessing their portfolios.
6. Evaluating the process.

Each step in the process is discussed below.

Identifying the Students' Readiness for Autonomous Learning

Identifying the students' readiness entailed finding out about the students' learning beliefs concerning the teacher's and students' roles at university and looking for their learning styles in learning English. In doing so, one attempted to know about the students' learning

autonomy, i.e., are they autonomous or are they in the process of its development or not? The aim behind making this attempt is also to identify their readiness for autonomous learning, so that the researcher can get an idea about how much awareness' raising is needed in this case. Therefore, two questionnaires were administered to the sample during the second week of studying. The first used instrument was the Learner Autonomy Questionnaire (Kashefian, 2002), while the second one was the researcher's own design.

In addition to these instruments, structured observations were also used in order to reveal the students' motivation and beliefs as well as attitudes in their learning process. These observations were conducted not only along the process of portfolio training but also before this process had started. Indeed, the two first weeks (from the 10th to 24th November) were devoted to these observations before the portfolios' implementation. When holding the first conference with them on the 26th of November, the subjects were asked about their beliefs concerning the role of the university teacher and their role as students. Besides the two questionnaires, observing and interviewing the subjects supported the aim of finding out about their autonomy and readiness to engage in its process.

Raising Their Awareness of Autonomous Learning

Before introducing the idea of portfolios one should bear in mind that because the students have never been introduced to these learning tools, nor have they been acquainted with autonomous learning approaches before, their resistance to the process was expected. For this reason, raising their awareness of the importance of being autonomous in learning and the role of portfolios in achieving this aim was crucial within this process. The awareness

raising stage within this study started during the third week of the study (i.e., on the 26th of November). On this day, a conference was held with all the three experimental groups and lasted for one hour and thirty minutes. The researcher started by asking the subjects questions about their feelings, opinions, and beliefs concerning studying at university. Then, she moved to asking them the following questions:

- According to you, what is the role of the teacher at university?
- Does it differ from that within middle or secondary schools?
- What have you noticed here? Are your teachers giving you everything you need within their courses?
- Do you find this acceptable (the teacher should facilitate your learning)?
- What is then the role of students?

Raising such questions created a debate in class where the researcher attempted to listen to their opinions, questions, and meanwhile understand how these students perceived things. In the light of the obtained feedback, the researcher explained both the teacher's and students' roles, the importance of being autonomous and developing the language portfolio. It is worth noting, that this awareness raising stage was taking place along the portfolio development. The researcher was always reminding the subjects of the importance of developing their portfolios, and showing commitment to their use, so that they get more autonomous in studying English. Observations were also conducted along this stage in order to reveal the subjects' reactions to and attitudes towards this process.

Introducing the Portfolio Content

Before introducing the portfolio content, the researcher asked the subjects whether they have used this tool during their previous learning experiences. They all answered that they have neither used it nor

heard about it before. Therefore, there was a need to familiarize them with the process of constructing or developing their portfolios because their ignorance of its mode may render it complex and demotivating process. The three sections of the student portfolio were introduced to them during the first conference. The objectives, content, and use of each section were explained. The first section 'the language biography' was sent to the students via emails in order to facilitate its access and encourage the students to use the internet for learning purposes. For the other sections 'the language dossier and passport,' they were given handouts which contained their objectives and instructions about their use. It is worth noting, that the portfolio's content was re-explained further during the lessons of written expression course because it was still unclear for some of them.

Along with such lessons, the subjects were also handed samples for suggested exercises, lessons, and tests. They were shown the criteria for selection and the need to justify the reason of their selected artifacts. To stimulate their interest in the process and clarify more what is expected from them within, the subjects were shown samples of the best produced portfolios of students of the previous year (2012-2013). The contents of such portfolios were discussed in groups and questions were raised concerning what needs to be done to achieve similar grades.

Checking How the Subjects Are Proceeding with Their Use and Providing Continuous Feedback

The researcher attempted to provide continuous feedback to the subjects through scheduled conferences and mostly along the taught lessons. Indeed, the first thirty minutes of each lesson was devoted to checking the students' portfolios by asking them questions such as: How are you doing with your portfolio? Are there

any questions, problems, or difficulties encountered with their development? The researcher went along the rows to see their portfolios and listen to their inquiries. Along this stage, one maintained the importance of keeping the portfolio up-to-date by completing its parts regularly, mentioning the date, time, and week of doing so. Emphasis was also put upon organization through separating each section and making clear each part of it. Justifying the inclusion of each artifact was stressed because it showed their reflection and aimed at achieving a reasonable selection based upon the preset criteria.

Furthermore, the researcher aimed at helping the students develop a liking for their portfolios in order to devote their commitment and concern to their accomplishment. They were often reminded of its benefits over their learning which could not be attained unless they liked this process. Along this stage, the researcher also attempted to motivate and encourage them to engage more in writing portfolios through praising them for their creativity, use of a particular strategy, or good selection of artifacts, besides pointing out to the mark which they will have for their portfolios.

As stated above, conferences were also used for the provision of this feedback.

1. The first conference on the 26th of November 2013 aimed at introducing them into the process and raising their awareness.
2. The second one took place on the 7th of January in which the researcher clarified the assessment criteria, provided them with the portfolio development checklists, and explained more the portfolio's content and construction process.
3. The third conference on the 20th of February attempted to find out about the students' reaction towards their marks of portfolios, their awareness of

their difficulties, and reasons of shortcomings, and their motivation to make further efforts to improve their portfolios. In this conference, the researcher sought for clarifying more what should be done and how to produce the intended portfolios. Additionally, new worksheets were handed to the students such as 'Feeling Good,' and 'My Progress Checklist.'

4. The fourth conference on the 15th of April concerned checking how the students' were getting along with their portfolios, especially for the new integrated parts.
5. The fifth conference was scheduled for the 8th of May, and it was devoted for listening to the students' difficulties, questions, or inquiries in relation to the portfolio process. During this conference, the researcher decided the deadline for submitting their portfolios for correction.

Assessing Their Portfolios

To assess the students' portfolios, the researcher developed a scoring rubric. It was based on the criteria upon which the portfolio was to be assessed. These criteria ranged from content to organization to presentation:

- Artifacts selection: Their support to the portfolio purpose, their organization, variety, clarity, and relevance (i.e., they can help students learn, understand the lessons and improve their English).
- Reflections: Their clarity, honesty, and completion of the assessment of the teaching contents and learning process and progress.
- The Portfolio: Completion of all sections respecting timelines, their organization, and creativity.
- Language Form: The use of grammar, spelling, punctuation, and capitalization rules.

Evaluating the Process

Within this investigation, the process of evaluating the students' portfolios included both product and process evaluation. That is, the researcher attempted to assess the product, i.e., the student portfolio through finding out which section(s) of the portfolio most of them did not accomplish and those which were completed successfully. In doing so, the researcher was trying to reveal to what extent their portfolios met the pre-set criteria for their development. Meanwhile, evaluation also concerned the process, i.e., how the students proceed with developing these learning tools. It took place along two stages. The first one was done after assessing their portfolios for the sake of revealing:

- Whether the students showed commitment to the process or not.
- What kinds of difficulties were apparent through their portfolios?
- To what extent they understood the researcher's feedback and instructions.
- Which group (among the participants) had really succeeded in the process?

Concerning the second stage, it was completed by the end of the first semester (two weeks after giving them back their assessed portfolios) through administering a questionnaire to the participants to fill in. Its objective was not only to look for the difficulties they were facing in developing and using their portfolios, but also to get an idea about their views and feelings concerning this process, including the teacher's explanation and guidance within.

Conclusion

Introducing language portfolios requires learners' awareness of their use and objectives targeted so that they can reflect over their learning through these tools. Using them as an assessment and learning tool entails involving in an organized and systematic process where learners'

involvement is required along with teachers' clear guidelines and feedback. Hence, learners' training into language portfolios should not be solely concerned with raising their awareness of this process and developing the effective strategies within, but it should first prepare them psychologically through

- Providing them with a learning environment where they want to engage, not have to engage (Tosh, Werdmuller, Chen, Light, & Haywood, 2006) and where they can voice their feelings, expectations, and opinions via the experience of assessing themselves in learning.
- Showing interest and commitment in it.
- Clarifying what language learning involves in order to change their expectations that language learning cannot occur without teacher's control (Gibran, 2000).
- Encouraging them to engage in the process through showing its benefits over their learning achievement.
- Raising their self-confidence and promoting their involvement through providing them with the chance to set assessment criteria and helping them "to clarify what they feel are appropriate criteria for evaluating their own learning" (Aoki, 1999, p. 153).
- Providing continuous support and guidelines while listening to their enquiries and difficulties with this form of assessment, besides, showing interest and commitment in this process.

Therefore, teacher-students' meetings need to be organized regularly, in order to clarify for the students the portfolio content, purpose, and assessment criteria. Also, to train learners to use portfolios and reflect over their learning, dialogue and interaction should characterize such meetings because they can improve reflection as Dysthe and Engelsen's (2004) research has proved. Moreover, if the

instructor is friendly while interacting with learners, it can encourage social and personal development in them and respect their whole person (Lefrancois, 1997).

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AN OUTSIDER'S VIEWPOINT OF GERMANY'S TEACHER EDUCATION REFORM: WHAT KIND OF INFLUENCE WAS BROUGHT BY TEACHER EDUCATION STANDARDS?

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Abstract: *In this article, teacher education reforms in Germany were analysed from a Japanese outsider's viewpoint. To describe the feature of "Germany" is never easy because of its diversity; however, from an outsider's viewpoint, certain unified features can be made clear. The symbol of today's reform is the teacher education standards from federal level symbolized with content standardisation. Most of all, its influence is radicalized in the first stage of teacher education –university. In the first stage, the framework regularising at a European level through the Bologna Process pushes the reform from behind. Through data analysis as well as field research in different states of Germany, the features of reform influence are described.*

Keywords: teacher education reform, teacher education standards, Germany, outsider's viewpoint

Introduction

Impacts on a country's education policy are not straightforward when this is taken from the country inside because they stand on the country's paradigm that has been taken for granted by insiders. Bray (1999, p. 222) pointed out that the field of comparative education can benefit to make foreign "strange patterns familiar" on one hand, and to make native "familiar patterns strange" on the other hand. This research will attempt to call reform features of German teacher education into question from Japanese viewpoint.

Today, teacher education reform is a common issue both in Germany and Japan. In the Japanese case, "the most serious crisis of teacher education today is that nobody draws up the grand design of it in the future" (Sato, 2008, p. 20). However, the influence of German teacher education reform seems to be surpassing the situation in Japan. In comparison with Japan where teacher training system and its curricula are authorized by one national ministry –

the Ministry of Education, Culture, Sports, Science and Technology (MEXT) – each of Germany's 16 federal states (*Länder*) has their own authorisation for education areas; consequently, teacher education schematics are highly diverse. Therefore, it is pointed out in advance that the limitations of understanding Germany as a whole.

However, there are certain common fundamental structures from outsider's viewpoint. In addition, the conference of ministers of education from all states (*Kultusministerkonferenz* [KMK]) passed a resolution in 2004 and 2008 for teacher education standards (*Lehrerbildungsstandards*, which is simplified as "TE-standards" below). Both standards were partially revised in 2014. These standards clearly defined the competencies (*Kompetenzen*) desired for teachers in Germany as a whole. In addition to such tendency on federal republic level, teacher education reforms are being sped up with the association of the "Bologna Process"

which is typified by university course structure reform on European level.

In this research influence from TE-standards within the whole stages of Germany's teacher education will be summed. In Germany, teacher education reform is one of the most controversial topics today. Terhart (2011, 2013) is one of the most important researchers in this area. As an international comparative study, Bosse, Moegling, and Reitinger (2012) are noteworthy. Almost all important policy documents on federal level are opened on the official website of KMK (<http://www.kmk.org/>). The website "Monitor Lehrerbildung" (monitoring teacher education: <http://www.monitor-lehrerbildung.de/>) managed by Center for Higher Education Development (*Centrum für Hochschulentwicklung*) et al. is furnishing fundamental data for all states. As related research in Japan, Yoshioka (2007) is a pioneering researcher. Watanabe and Neumann (2010) and Kido (2012) are also important. However, comparative approaches to teacher education system as a whole in Germany and Japan have not been conducted enough yet.

While learning from both Japanese and German previous research, the influence of the reform from pre-service to in-service level as a whole will be analysed from an outsider's viewpoint including the author's field research. The aim of this research is to overcome a country's paradigm and to reach implications for future teacher education.

Traditional Teacher Education Schematic and Comparative Viewpoint from Japan

Germany is a federal republic nation made up of 16 federal states. Each state has traditionally been entrusted with the independent authority relevant to education and cultural administration

(*Kulturhoheit*). Namely, in the area of school education and teacher education there is no authority, taking the Federal Ministry for Education and Research (*Bundesministerium für Bildung und Forschung*) which deals with vocational education and scholarships among other things as an exception, instead there is KMK.

From an outsider's viewpoint, there are common aspects in teacher education that are nation-wide in Germany: (a) first stage training at multidiscipline university (*Univeristät*); (b) completion master course (instead of the former first national exam, *Erstes Staatsexamen*); (c) second stage training in the form of practical pedagogic training as trainee teacher (*Referendar*); (d) passing of the second national exam (*Zweites Staatsexamen*); (e) application to each state as successful candidates; and (f) lifetime employment as civil officer (*Beamte*) (see Figure 1 in Appendix A). A part of German teachers today is not *Beamte* but *Angestellte* as contract civil officer.

In Japan the most common way to become a teacher is (a) completing the teacher training curricula on bachelor stage at a university or college; (b) acquiring the regular teacher certificate from prefectural board of education; (c) taking the selective examination for teachers in each prefecture; and (d) employment as a civil officer. In 2009 teacher as an occupation of lifetime employment was outmoded by the introduction of the teacher certificate renewal system (every ten years) throughout Japan (see Figure 2 in Appendix A).

In comparison with Japan, teachers in Germany are positioned as a profession with professional training on same level as a judicial officer such as a lawyer. Primarily in Japan, bachelor stage training is the base of teacher training, which is very different to the two-stage professional

training including bachelor-master stage training (first stage) and *Referendar* (second stage) in Germany. However, in comparison with Anglo-American and Anglo-Saxon type countries, in general, in Germany and Japan teachers are stable occupations and there are many candidates who want to be teachers.

In Japan where provincial policy does not hold much authority, one central government (MEXT) makes centrally driven reforms nationwide as part of a quality assurance policy in the pre-service and in-service education. On the contrary, each 16 federal states in Germany have the independence in matters of education. In addition, after compulsory primary education there is a connected structured framework of several secondary school types; therefore, the type of teachers for each form of school is various. Because of such diverse school policies and school systems depend on each state, teacher education schematics become extremely varied.

Nonetheless, TE-standards symbolized by the reforms in recent years have been given a united direction. Concerning the teacher classification, the 2005 KMK resolution (*Quedlinburger Beschluss*) classified education stages and school types into six forms (*Grundschule, Realschule, Hauptschule, Föderschule, Berufsschule, and Gymnasium*). Additionally, in 1999 the Bologna Process was introduced to create the 'European Higher Education Area.' As a result, common framework construction in European level moved ahead.

In consequence, a set of teacher education reform influences including TE-standards, particularly in university as the first stage, became radicalized. Simply, the structure was captured as TE-standards that are typified by federal level reforms which are being sped up with the association of the Bologna Process, which is typified by

European level reforms. Furthermore, the resulting reforms direction can be summed up by (a) *content standardisation* by teacher education standards corresponding to teacher training course orchestration and (b) *framework regularising* including items such as bachelor-master degree system, staged course framework, European Credit Transfer and Accumulation System [ECTS], universities' own completion examination, and so on (Tsujino, 2010, 2014). On the other hand, because of the continuity of TE-standards to the second and third stages, the influences at the first stage do not stop there.

In Germany the concepts of teacher education (*Lehrerbildung*) includes pre-service training (*Lehrerausbildung*) and in-service training (*Fort- und Weiterbildung*). In this research the overall influence of reform in teacher education was analysed from the angle of TE-standards. In addition to the two staged professional training schematic, teacher in-service training is regarded as the third stage of teacher education. What kind of influence was brought by TE-standards with the various stated competencies into each stage of Germany's teacher education?

TE-Standards and Competencies of Teachers

TE-standards in Germany were designed to rise over different states, one of the reasons being due to the 'PISA shock of 2001' in which the pupils' lack of academic ability in the international academic aptitude tests generated criticism of schools and teachers in Germany. In this regard, prior to the 1990s before the PISA shock, at German Rectors' Conference (*Hochschulrektorenkonferenz*), KMK, German Science Council (*Wissenschaftsrat*), and so on, teacher education reform recommendations had already been

mentioned (Yoshioka, 2007). However, PISA shock can be seen as the most decisive element that led to today's quality assurance (*Qualitätssicherung*) policies and implementation of TE-standards.

General standards have a goal while the input and the process are clearly specified as autonomous. In the case of TE-standards, however, the input and the process attributes have been defined with the corresponding module formation coupling with accreditation. TE-standards clearly define the competencies that future teachers and in-service teachers should obtain, these come from the 2004 educational sciences standards (KMK, 2004) and subject teaching standards (KMK, 2008). The four competencies areas for the 2004 educational sciences standards are teaching (*Unterrichten*), education (*Erziehen*), assessment (*Beurteilen*), and innovation (*Innovieren*). These competencies are further concretised into eleven competencies.

The 2008 subject teaching standards clearly specify each subject content and didactics. The framework for subject teaching standards is made up of three parts: (a) mission, (b) teacher's professional competence definition related with the subject, and (c) subject profile. Within the subject profile 19 disciplines (not including vocational education) are described. Subject profile is composed of two training parts: (a) subject specific professional competency profile and (b) learning content. However, most of these subjects also remain enumerated only with the minimum points and the quantity for each subject is A4 text length and simply around 1.5 pages long on the average. As a minimum standard, the attributes are strong and competencies are limited to specific procedure levels. However, it is important that the desired competency for teachers without any distinction of school type is clearly specified and that it lays the foundation of the course accreditation.

These two TE-standards are not necessarily laid down from a political top-down system. They were developed from the collaborative work of teachers' unions and educational scientists. In fact, the four competencies in the area of educational sciences standards were created on the base of mutual understanding with the teachers' unions' representatives and the KMK in October, 2000 (KMK, 2004, p.3). Additionally, TE-standards derive from Terhart (2000, 2002). Furthermore, the German Society for Education Research (*Deutsche Gesellschaft für Erziehungswissenschaft; DGfE*, 2004) has adhered to the statements from the standards draft report set forth by the KMK. The DGfE welcomed the creation of TE-standards by the KMK. This standard can assure that teachers can develop the desired professionalism through their own actions. Comparing this with Japan, it can be said that *consensus formation* among stakeholders was a big feature of German educational policy.

TE-Standards' Influence on the First Stage

The KMK's resolution itself is legally non-binding; however, TE-standards are placed within legislation and state regulations among each state. For example, the Berlin teacher education law (*Lehrkräftebildungsgesetz*. The English name and text of the law are translated by the author. All below are the same.) stated

...Standards for teacher education as the resolution of the conference of ministers of education from all states in German Federal Republic (*Kultusminister-konferenz*) are foundation for teacher education. (Clause 1, Article 1)

Also, the ordinance about master completion of teacher training in the state of Niedersachsen (*Verordnung über Masterabschlüsse für Lehrämter in Niedersachsen*) prescribed 'competencies in educational sciences and two teaching

subjects according to appendix one to three are to be acquired in the course.’ In the appendix of the ordinance the state standards of Niedersachsen are specified.

Notably in the first stage (university), the joining together of the Bologna Process with TE-standards influence is becoming radicalized. More specifically, TE-standards are structured on module formation within the teacher training course: students learn pre-determined modules in a given time and each university’s own completion examination has been replaced with the former first national exam. An accreditation to teacher training courses is regularly conducted. Course framework regularising from a European level is moving ahead in many federal states. However in the states of Bayern, Mecklenburg-Vorpommern, and Saarland, even now the first national exam used in the first stage of course completion is recognised. Furthermore, the state of Sachsen once eliminated the first national examination and then brought it back. Depending on the state, differences continue to exist. In spite of this, the influence of TE-standards can be seen in these states.

For example, the Saarland University, the only university that conducts teacher training in the state of Saarland, has neither the course structure under Bologna process nor its own exam implementation. Namely, the first national exam is not abolished. However, ECTS and modules are already implemented. Additionally, teacher training course modules are formed on the basis of state TE-standards. This state’s own standards are made up of four competency areas which have 12 competencies below these and are similar to educational sciences standards. The module count is seven and published in a *Module Handbook (Modulhandbuch des Lehramtsstudienfachs Erziehungswissenschaft/Pädagogische Psychologie)*. Each module has a topic name and all of

these topics correspond to four competency areas of state standards. The development of a module handbook has the universities’ items. Also in this governing book, study and examination provisions, subject specific supplements, and study design formulation are included.

Below is feedback from interviews in the first stage (translated into English by the author). The field research was mainly conducted in the states of Niedersachsen located in prior West Germany and Brandenburg located in prior East Germany as earlier reform models and in the state Saarland and Bayern located in South Germany as a traditional model. In these states, qualitative research is being conducted at universities, teacher education institutions, schools, state ministries of education and so on.

- “Students can learn from regular and clear courses.” (Prof. Dr. Heidemarie Kemnitz, Technical University of Braunschweig, March 6, 2012)
- “The freedom at university is strong therefore the acceptance of standards is slow. Under university professors’ feeling teacher training remains a ‘voluntary service.’” (Prof. Dr. Ewald Terhart, University of Münster, March 8, 2012)
- “Modulation of the courses as a form of learning makes students extremely busy.” (Former Prof. Dr. Hans-Werner Bederfsdorfer, Teacher Education Centre of Saarland University, February 19, 2013)

From the students’ angle, it is difficult to compare the new course with the old one because the new framework is taken as given and fixed. In spite of that, a student who completed the new teacher training course, and rather than become a *Referendar*, choose to go on to a doctoral program expressed as follows:

- “... from having the first national exam as a one shot thing to the current layering where each module

examination becomes part of the university completion examination is good.”

- “In contrast to the new course, the students in old diploma course looked like they had more free time. The students who study the new master’s course are frantically studying for their module examinations at the end of each semester.” (Quotes from a student at Flensburg University, October 25, 2013)

The reactions to the set of reforms were various; however, there were only a few negative opinions regarding the standards themselves.

TE-Standards’ Influence on the Second Stage

The influences on the second stage (as *Referendar*) will be addressed. In Germany there is a training period from one to two years as a *Referendar* after university completion. A *Referendar* must pass the second National Exam to become a teacher. The training takes place at schools and state *Referendar* training institutions. These institutions are not classified as higher education; therefore, the Bologna Process does not have any impact. However, influence from TE-standards can still be seen. Although KMK resolved the new standard for the process of *Referendar* and the state examination in 2012, the concrete contents still depend on the former two standards (KMK, 2004, 2008, 2014).

In the state of Niedersachsen, for instance, it is stated in ordinance about the training and examination of *Referendar* (*Verordnung über die Ausbildung und Prüfung von Lehrkräften im Vorbereitungsdienst*).

The aim of the preparatory service is that *Referendar* obtain competencies prescribed in appendix on the basis of seminar program and curriculum in a

close connection with school practice’ (Article 2).

In the appendix of this ordinance, standards that come from five competency areas are specified. Below is feedback from interviews at the *Referendar* training institution in the state of Brandenburg.

- “*Referendar* training institution has taken KMK’s subject teaching standards and making up of our own standards...”
- “subject teaching standards have only a generic description of subject content. Therefore more concretization is necessary. However, this would be a huge amount of work to do for all subjects ...”
- “KMK’s TE-standards have made training at *Referendar* training institutions visible ...”
- “the Bologna Process has strengthened universities autonomy and this has made the connection with the first stage difficult, however, there is communication with the universities teacher education center.” (all quotes from Dr. Angelika Horeth, director of the *Referendar* training institution, May 11, 2011)

The teacher education reforms at the second stage do not end by influence from standards. Reforms that are shortening the preparatory service time in each state are progressing from the pressure of the state financial administration who administers salary payments to *Referendar*. Such time shortening reform coupled with the simplification of the second National Exam.

In interviews from the GHR *Referendar* training institution in Braunschweig in the state of Niedersachsen;

- “The competencies of TE-standards become training goals in the institution.”
- “The focal point is intensive training however, the recognition gap between

the mentors at schools that accept *Referendar* and the teacher educator at *Referendar* training institution has become obvious.” (quotes by Heike Coordes, deputy head of the *Referendar* training institution, March 6, 2012).

In the second stage, while framework regularising of course structure such as the first stage cannot be seen, content standardisation by the TE-standards are partially progressing with coming with the shortening of the preparatory service timeframe on the training course.

TE-Standards’ Influence on the Third Stage

In Germany, teacher training is equivalent to that of a judicial officer as a two staged professional training system as mentioned above. It follows the logical structure of being a full profession once they enter the workforce. Therefore the third stage as in-service education is voluntary for each teacher. This is different to the structure in Japan where in-service education is compulsory under central and local government initiative. In Japan, in addition, school based in-service trainings, such as lesson study (*Jugyo-kenkyu*), are also very common. On the contrary, under the German voluntary structure for each teacher, applying the competency mentioned in TE-standards to actual in-service education is difficult. Standards are not always fit for the needs of individual teacher.

In the state of Bayern, as a specific example, the teacher education law (*Bayerisches Lehrerbildungsgesetz*) regarding training obligations states, “Teachers are under obligation to their own further education and attending official in-service education events as a line of duty” (Clause 2, Article 20). By the public announcement ‘Teacher In-service Education in Bayern’ (KMKBek vom 9,

August, 2002) from the state Ministry of Education (*Bayerisches Staatsministerium für Unterricht und Kultus*), compulsory in-service education is for four years and 12 training days (one training day if converted is around five hours) and at least one third is conducted within the school (“II. Training Provision and Training Obligation,” paragraph 2).

In-service education is correlated into four areas: central training, provincial training, area training, and school-on-campus training. ‘In-service education for schools in Bayern’ (*Fortbildung in bayerischen Schulen*, FIBS) is the database (<http://www.fibs.schule.bayern.de/>) including from state enforced/supported program to outside collaborated program in which teachers can participate. It is highly important that teachers have freedom to not only attend established programs but also hold new programs on their own. This has resulted in vast numbers of programs by themselves (Sakakibara & Tsujino, 2014).

From the side of the teacher education department at the State Ministry of Education remarked as follows:

- “There is no standardization of the teacher in-service education within German states and commonwealths. Kind, spectrum and contents of teacher in-service education is heading toward in each state depending on the needs of teachers, school types and latest themes.” (Alfred Glasl, head of the exam office, November 12, 2012 [e-mail interview]).

The then chief of the former state institution for teacher education and school development in the state of Niedersachsen (Niedersächsisches Landesamt für Lehrerbildung und Schulentwicklung; NiLS) stated:

- “... Inside in-service education, two professional actors engage in each other. ...If the needs from university

professors and the needs from school teachers are combined each other, then it works well...This is an important philosophy that in-service education and pre-service education are to be distinguished as completely different things.” (Werner Niermann, chief of the institution, October 5, 2006)

Under such situations, influence from TE-standards and competencies-oriented policy was not under observation.

Conversely, the branch office of Germany’s largest teachers’ union (*Die Gewerkschaft Erziehung und Wissenschaft* [GEW]) in the state of Nordrhein-Westfalen criticised the actual situation of the in-service education. The GEW requires quality standards and indicators for in-service education. After actual analysis of teacher in-service education, there were 28 items recommended: clear concept, budget, quality analysis, guarantee, training institutes, supplier roles, and so on (GEW-NRW, 2011). The structure where state governments oppose standardization and teacher unions want this is opposite to the structure in Japan.

From this outlook of Germany’s in-service education, its diverse ways – rooted in individual teacher’s needs – are more important than standardized competencies. To follow recent research tendency in Germany, the author attended DGfE symposiums in 2011 (Berlin, May 12-13) and in 2012 (Dresden University of Technology, September 20-21), and the German Society for Educational Administration (*Deutsche Gesellschaft für Bildungsverwaltung; DGBV*) symposium in 2013 (Flensburg, October 25-26). Even here radical criticisms toward TE-standards themselves did not seem to be discussed enough by insiders.

Conclusion

In this research, the influence of the overall three-staged teacher education in Germany from the angle of TE-standards was examined. In conclusion, it can be pointed out from the outsider’s viewpoint that continuous reform trends are forming some common aspects as Germany: (a) the first stage, the joining together of the Bologna Process with TE-standards influence is getting radicalised; (b) the influence in the second stage is partial but has impacted contents; and (c) the influence in the third stage cannot be seen because it is held depending on the needs of teachers and standards do not harmonize with them.

Germany’s education policy can be formed on the premise of consensus among the stakeholders whereas Japan’s education policy is developed on centralised reform such as a flat regulation to university training, legal in-service education, teacher certification renewal system, and so on. There are few chances to choose in-service programs depending on the needs from teachers. Furthermore, there are few chances for teachers either to hold their own program in Japan. Moreover, situations, such as German teacher unions themselves demanding standards regarding in-service education, are not heard of in Japan. However, the influence of German TE-standards at the first stage is surpassing the situation in Japan. For, not only content standardisation at a federal level by TE-standards but also framework regularising at a European level by the Bologna Process are progressing. These, according to each state, have become reform pressures from “above.” On the contrary, in Japan, there are neither national TE-standards nor reform pressures above the national level. That is to say MEXT as the central ministry of education has strong authority. However, it makes more and more difficult in Japan, which has around 1.5 times bigger

population compared to Germany, to function blanket reforms for the whole country. The actual influence of Japan's reforms has been diversely seen in each area and at each university, too.

The original envisioning of TE-standards was that they were not only teacher competencies but standards for regulating system (Terhart, 2002). In short, it was assumed that quality assurance of the state ministry of education and municipal and local school administrations by drawing a line from the influence of individual teachers' competencies. However, TE-standards are missing these perspectives and as a result, the limited teacher competencies are focused on. Teachers' union criticised as follows:

- "The competencies of teachers and quality of pre-service and in-service education should be understood as the matter which is related with central challenge to be overlooked too little resources." (GEW, 2013, p. 7.)

In TE-standards, educational sociology, educational psychology, and didactics are made important. However, teachers in Germany have to play important roles

within a huge public education system; they are required to keep a balanced relationship among the state supervision of school, school autonomy, educational participation by teachers, parents, and students, and pedagogical freedom of teachers as legal concepts. Therefore, teacher education exactly for these purposes is not enough with only competencies at practical level. If the teacher education reforms are maintained with committing to limited specific fields, the diverseness of teaching profession in the long term will come close to a crisis.

Finally, in an era where there is a desire for school education to be internationalised, it has become necessity to internationalise teacher education. The PISA regime has opened up competition between nations as a quality assurance policy and has caused reforms. This direction leads to holding issues of education within the nation and makes it harder to internationalise. However, with direction with short-term achievement orientated subjects under the name of quality assurance policy, the situation will be a problem that both Japan and Germany have.

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Appendix A

Figure 1. Germany's Teacher Education System

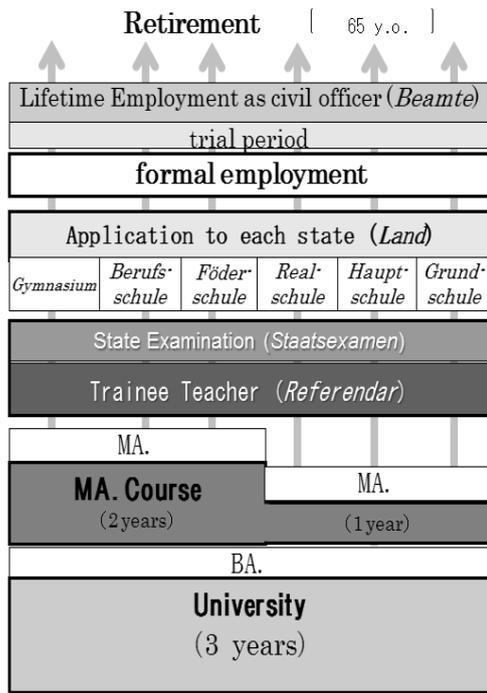
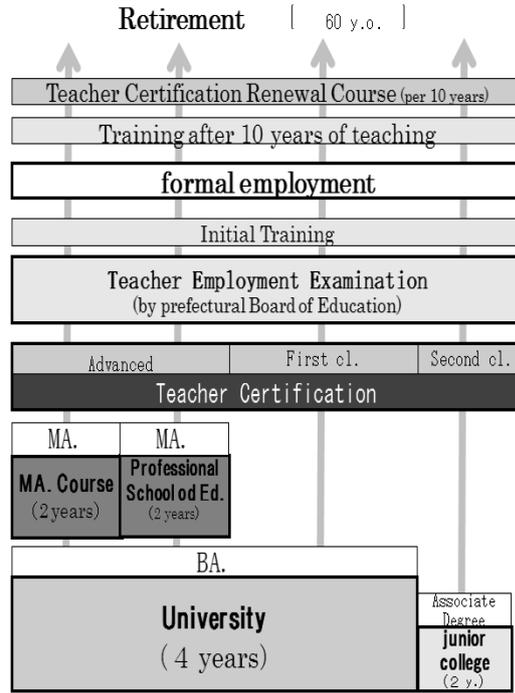


Figure 2. Japan's Teacher Education System



(Resource: drawn by Tsujino making reference to Yoshioka, 2007, pp. 312 & 328.)

TEACHING MATHEMATICS IN A VOLATILE, UNCERTAIN, COMPLEX AND AMBIGUOUS (VUCA) WORLD: THE USE OF CONCRETE – REPRESENTATIONAL – ABSTRACT INSTRUCTIONAL STRATEGY

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Abstract: *This paper presents the teaching of mathematics in a volatile, uncertain, complex and ambiguous world with the use of concrete – representational – abstract instructional strategy (CRAIS). The CRAIS involves active participation of students in learning. The study adopted the pretest-posttest, control group, quasi experimental design. 191 senior secondary II students from four public schools purposively selected from two local government areas in Ibadan municipality were randomly grouped into one experimental and one control group. The experimental group was exposed to CRAIS and the control to modified conventional teaching strategy for 6 weeks. Instrument used was Students' Mathematics Achievement Test ($r = 0.83$). Two instructional guides on CRAIS and modified conventional teaching strategy were also used. Data were subjected to analysis of covariance. It was found out that the performance of the students taught with CRAIS improved significantly. Therefore, the teachers of mathematics should learn the use of CRAIS for effective teaching of mathematics.*

Keywords: concrete-representational-abstract instruction, teaching strategy, achievement in mathematics, learning difficulties

Introduction

Volatility, uncertainty, complexity, and ambiguity (VUCA) describes the conditions under which organizations, corporations, and institutions operate in the world today. As there is no predictability for every issue that may arise, it becomes necessary to plan for any issue that may arise. The VUCA world calls for innovative strategies and processes that can be used to cope in any given situation, and if treated right, the VUCA world can be an opportunity for knowledge workers to learn and develop effective agile and flexible strategies. According to Adamson (2013), VUCA is a way of assessing and providing for the changeability of general situations and events which are completely unpredictable. One of the most important ways that mathematics teachers can interact with the VUCA world is through constant learning and accessing new information and new processes.

Volatility refers to the ease and speed in which a situation can change. The methods of teaching mathematics as well as those for solving mathematics problems change rapidly. Downie and McCartney (2013) argue that the required changes need to be cultural: Teachers

need to be given an environment equipped with the necessary materials for teaching mathematics, be given moderate periods to teach for effectiveness, and be made comfortable. Tools and technology must be created to nurture learning environments. The problem of uncertainty of the best methods to adopt in the 21st century world also exists. The mathematics teachers' method of teaching must therefore reflect the balance between teaching skills and mathematics knowledge that is necessary to educate and inspire students. The teaching must meet the needs of individual students and the larger group.

Uncertainty refers to the lack of knowledge that surrounds unforeseen events. The teaching of mathematics is uncertain for the teachers of mathematics have never been sure about what their students understand, whether the misunderstandings come from inadequate content or incomplete understanding of difficult concepts. There is also uncertainty about how the teachers can improve on their own classroom practices because no one can be sure of the teaching approach that will be most successful with a particular group of students. The students and the society believe that mathematics is so complex that it is the

most difficult subject and should be avoided. This is due to the teaching of the subject in abstract terms. It lacks clarity in the proof of some theorems and involvement of too many mathematical formulae. Mathematics is ambiguous symbolically, has multiple solutions to a single problem, and has paradigmatic and definitional ambiguities. These issues present the potential for confusion and misunderstanding.

Mathematics is viewed as the basis for science and technology and the tool for achieving scientific and technological development. Mathematics plays important roles in the expression of scientific models while the extensive use of its method is required in observing, collecting information, measuring, hypothesizing, and predicting result of scientific investigation. Furthermore, Olusi and Anolu (2010) identified the importance of mathematics and concluded that without mathematics, there is no science. Cangiano (2008) and Citizendum (2010) reiterated the fact that without modern technology, there is no society. It is prerequisite for advanced training and lifetime career choice. In the 21st century, the era dominated by computers, jobs that contribute to the economy will require workers who are prepared to absorb new ideas, perceive patterns, and solve unconventional problems. Mathematical preparation is a key to

leadership in our technological society. Economic necessity and concerns of equity demand revitalization of mathematics education. It is, therefore, vitally important to Nigeria (most likely, all the nations of the world) and each individual, that all students receive a quality education in mathematics.

As important as mathematics is to human activities and development, one would expect that students' learning outcomes would be good. The opposite, however, is the case. Students view mathematics particularly in more abstract forms, as an abstruse and pointless subject to study (Otung, 2001). Mathematics educators carried out research on methods and ways of improving the teaching and learning of mathematics at primary and secondary school levels (Adekoya, 2008; Afolabi, 2010; Akinsola & Ogunleye, 2003; Ugbo-duma, 2008). In spite of these numerous research studies as well as efforts at the instructional level over the years, the performance of students at the West African Senior Secondary School Certificate Examinations (WASSCE) is yet to improve significantly as students are still performing poorly in the subject. Table 1 illustrates the summary of students' achievement in mathematics over a period of thirteen years from 1999 to 2011.

Table 1
Statistics of Entries and Results in Mathematics 'O' Level at the Senior Secondary School Certificate Examination May/June for Nigeria (1999-2011)

Year	Number of candidates	A1-C6		D7-E8		F9	
		N	%	N	%	N	%
1999	756,680	138098	18.3	212514	28.0	381029	50.4
2000	634,604	208244	32.8	196080	30.9	230280	36.3
2001	1,023,102	373955	36.6	334907	32.7	314240	30.7
2002	908,235	309409	34.1	308369	34.0	290457	32.0
2003	926,212	341928	36.9	331348	35.1	229878	24.8
2004	832,689	287484	34.5	245071	29.4	300134	36.0
2005	1,054,853	402982	38.2	267600	25.4	363055	34.4
2006	1,149,277	472674	41.1	357325	31.1	286,826	25.0
2007	1,249,028	584024	46.3	333,844	26.7	302774	24.2
2008	1,268,213	726398	57.3	302266	23.8	218618	17.2
2009	1,348,528	634382	47.0	344635	25.6	315738	23.4
2010	1,306,535	548065	42.0	363920	27.9	355382	27.2
2011	1,508,965	608866	40.4	474664	31.5	421412	27.9

Table 1 shows that it was only in 2008 that students recorded fairly good results with about 57.3% obtaining credit pass and above in the subject. The percentage pass was as low as 18.3% in 1999 while in years 2000-2005, it revolved around 35%, and in more recent years 2006, 2007, 2009, 2010 and 2011, it revolved around 45%. This trend is poor for a very important subject like mathematics and raises questions on the effectiveness of classroom teaching and instructional strategies adopted.

An investigation into the problems of poor students' achievement in the subject revealed that learning problems in mathematics may be caused by intellectual, physical, social, and emotional factors (Sharma, 1999). Additionally, home and school environments, anxiety due to bad experience from previous schooling, lack of self confidence by students, lack of teachers' consideration for students' various learning styles, inability to connect mathematics concept with their everyday lives, and the teaching strategies used by the teacher may cause poor achievement in mathematics.

Concrete – representational – abstract instructional strategy (CRAIS), which involves active participation of students in learning, provides an organizational structure within which lessons can be designed to effectively help students reach an abstract level of thinking around difficult concepts and content. CRAIS consists of three parts with each part building on the previous instruction to promote student learning and retention, and addressing conceptual knowledge of students (Access Center, 2004).

Concrete: At this stage, teacher begins instruction by modelling each mathematical concept with concrete materials. The students must work together with teacher's guidance, student interactions, repeated teacher

demonstrations and explanations, and many opportunities for students to practice and demonstrate mastery of concepts.

Representational: The mathematics concept is modelled at the semi-concrete level which may involve drawing pictures that represent concrete objects.

Abstract: The mathematics concept is modelled at the symbolic level using only numbers, notation, and mathematical symbols.

This strategy has its root in Dale's Cone of Experience that learners retain more information by what they "do" as opposed to what is "heard," "read," or "observed" (Dale, 1969). The author asserted that people generally remember 10% of what they read, 20% of what they hear, 30% of what they see, 50% of what they see and hear, 70% of what they say and write, and 90% of what they do as they perform a task. This implies that action learning techniques result in up to 90% retention. Dale (1969) also emphasized that instructors should design instructional activities that build upon more real-life experiences. Real-life experiences make use of more of human senses, and the more senses used, the greater the chance to learn and remember an event (Dale, 1969).

CRAIS actually refers to a simple concept of teaching mathematics to students with learning difficulties (Butler, Miller, Crehan, Babbitt, & Pierce, 2003). As the Access Center (2004) pointed out, the strategy works well with individual students, in small groups, and with the entire class. CRAIS is also appropriate at both the elementary and secondary levels. The National Council of Teachers of Mathematics (NCTM) recommends that when using the instructional strategy, teachers should make sure that students understand what has been taught at each step before moving instruction to the next stage (Berkas & Pattison, 2007).

CRAIS makes learning real by changing the abstract concepts of mathematics into real objects that can be visualized. Another purpose of teaching through a concrete-to-representation-to-abstract sequence of instruction is to ensure that students truly have a thorough understanding of the mathematics skills they are learning. Akinoso (2011) in the study of factors affecting students' achievement discovered that availability of concrete objects as instructional materials can affect achievement in mathematics. Concrete knowledge involves knowing how to manipulate concrete objects or their representation to solve a problem (Slavin, 2009). Many strategies have been developed, but teachers were not trained to use them.

Girls around the world are not worse at mathematics than boys, though boys are more confident in their mathematics abilities; girls from countries where gender equity is more prevalent are more likely to perform better on mathematics assessment tests (American Psychological Association, 2010). Gender inequality in education has remained a perennial problem of global scope (Bordo, 2001; United Nations Educational Scientific and Cultural Organization [UNESCO], 2003). The poor mathematics performance of students is worsened by gender imbalance leading to the problem which now constitutes a major research focus across the globe (UNESCO).

Akinsola and Tijani (1999) point out that mathematics is not a male dominated subject as claimed by some people, but rather, for both sexes provided they are subjected to the same teaching and learning conditions. Plato denied that there is any systematic difference between men and women with respect to the abilities relevant to guardianship – the capacity to understand reality and make reasonable judgment (Kemerling, 2001). Thus Plato advocated that prospective guardians, both

male and female, should receive the same education and be assigned to the same vital functions within the society. In Nigeria, gender-achievement studies found no significant relationship between gender and achievement in number and numeration, algebraic process, and statistics (Abiam & Odok, 2006). They, however, found the existence of a weak significant relationship in geometry and trigonometry. Opolot-Okurot (2005) also found differences in students' attitude towards mathematics based on gender. Due to this inconsistency, contradictions and lack of finding clear trend in gender as it influences students' achievement in mathematics, more investigation is necessary. Therefore, the variable is investigated in terms of its influence on students' achievement in mathematics.

Statement of the Problem

Mathematics play a significant role in this modern age of science and technology, yet students are not performing well in the subject. Available evidence shows that students' poor performance is due to their learning difficulties in the subject which could be ameliorated using strategy which include concrete-representational-abstract instructional strategy which allows active participation of students in learning through cutting and modelling of the concepts. However, the teaching of mathematics at the senior secondary school level in Nigeria has not explored this strategy. This study, therefore, investigated the effect of concrete-representational-abstract instructional strategy on students' achievement in mathematics.

Hypotheses

The following alternative hypotheses were formulated and tested at 0.05 level of significance.

H₁: There is significant main effect of treatment on students' achievement in mathematics.

H₂: There is significant main effect of gender on students' achievement in mathematics.

H₃: There is significant interaction effect of treatment and gender on students' achievement in mathematics.

Scope of the Study

This study covered SS II Mathematics students drawn from four selected senior secondary schools in Oyo State, Nigeria. The study determined the effects of concrete – representational – abstract instructional strategy on achievement in mathematics. It also found the moderating effect of gender on their achievement in mathematics. The contents selected for this study were circles, volume of solids, and angles of elevation and depression. These concepts were listed in West African Examinations Council [WAEC] Chief Examiners' reports of 2004, 2005, 2007, and 2009 as the areas where candidates performed poorly in the senior secondary school mathematics examinations.

Significance of the Study

It was hoped that findings of this study would help teachers to help students develop tangible understandings of mathematics concepts. When students are supported to first develop a concrete level of understanding for any mathematics concepts, the foundation can then be used to later link their conceptual understanding to abstract mathematics learning activities. This would give them confidence in coping with everyday life problems. It was also anticipated that findings from this study would help teachers of mathematics in making the learning of different concepts in mathematics real and reduce the teachers' constraints in teaching and would further improve students' achievement in mathematics.

Parents would also benefit from this study in the sense that they would be relieved of the financial burden arising from persistent poor performance of their children and wards in mathematics all the time and the attendant re-enrolment of their students for the examinations. Hence, their resources would be conserved when students do not have to re-register for examinations especially in mathematics. The study is significant to the society in the advancement of science and technology and overall development which cannot be achieved without a sound knowledge of mathematics. Also, the study would provide useful information to mathematics educators, curriculum developers, and government agencies on the introduction of remediation into the programme of mathematics teaching and learning.

Methodology

Design

The study adopted the pretest-posttest, control group, quasi-experimental design. This design is schematically represented as:

E:	O ₁	X ₁	O ₂
C:	O ₁	X ₂	O ₂

O₁ represents pretest for the experimental group and control group. O₂ represents posttest for the experimental group and control group. X₁ represents CRAIS experimental treatment. X₂ represents the control treatment of modified conventional teaching strategy (MCTS).

Sampling

Two local government areas were selected randomly from the list of the local government areas in Ibadan. Two senior secondary schools were purposively selected from each of the two selected local government areas, making four schools based on two criteria: the school must be public co-educational and the SS II students in the schools must have

completed SS I mathematics curriculum at the time of the study. Each local government area selected was randomly assigned to treatment such that the two schools in the local government area were for the same treatment group so that if there is any interaction between teachers in the same local government, it would not affect the study because of the same treatment. Two schools were assigned CRAIS and two were for control.

Instruments

Three instruments used for this study were (a) Instructional Guide on Concrete-Representational-Abstract Instructional Strategy (CRAIS), which is a self-designed guide to teach the students in the experimental group based on the steps listed by the Access Center (2004). (b) Instructional Guide on Modified Conventional Teaching Strategy (MCTS) based on normal ways of writing lesson notes with little adjustments. The teachers in this group were given some steps to follow to ensure uniformity. Prior to use in the study, the instructional guide was given to two senior secondary school mathematics teachers for review and all their suggestions were incorporated in the guide. (c) Students' Mathematics Achievement Test (SMAT) is a forty-five item multiple choice test constructed by the researcher to measure students' cognitive achievement in mathematics. The SMAT has two sections: the first section contained the demographic variables of the students. The second section consists of forty-five multiple choice items on the selected topics in SS II mathematics curriculum. The content covered the following areas: circles, volumes, and angles of elevation and depression. The instrument was validated after which fifteen items were dropped out of initial sixty. The reliability was determined using Kuder-Richardson

formula 20 (KR-20). The difficulty levels were computed, and the result of the analysis was used to pick items that were neither too difficult nor too easy. These yielded difficulty indices of between 0.32 and 0.56 with a reliability index of 0.83.

Procedure for Data Collection

The first 2 weeks were used for the training of the research assistants and the mathematics teachers taking part in the study. The researcher was the resource person. Fourteen teachers and two research assistants were trained to ensure that participating teachers adhered strictly to the instructional and experimental procedures. Twelve teachers were trained with CRAIS, but two were selected for the experiment. Two teachers for the control group were asked to use the steps on the instructional procedure on MCTS. The SMAT was administered to the students as pretest. The instructional packages prepared by the researcher were used by the trained teachers to teach the students for six weeks after which the posttest was administered using SMAT.

Method of Data Analysis

Data collected were analyzed using the analysis of covariance (ANCOVA). This was used to test the hypotheses stated. Also, the multiple classification analysis (MCA) aspect of ANCOVA was used to determine the magnitude of the mean scores of the different groups.

Results

H_1 : There is significant main effect of treatment on students' achievement in mathematics. From Table 2, treatment has significant effect on students' achievement in mathematics ($F_{(1, 190)} = 3.31$; $p < .05$). Hypothesis 1 is, therefore, not rejected.

Table 2
ANCOVA of Posttest Achievement Scores

Source	Type III – Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Mod.	918.18	4	229.55	3.34	.01	.07
Intercept	6576.90	1	6576.90	95.59	.00	.34
Pretest	743.16	1	743.16	10.80	.00	.06
Treatment	227.95	1	227.95	3.31	.04*	.02
Sex	40.03	1	40.03	.58	.04	.00
Treatmt x sex	.81	1	.81	.01	.91	.00
Error	12797.01	186	68.80			
Total	92778.00	191				
Corrected total	13715.19	190				

*Significant at $p < .05$

Table 3 shows that students in CRAIS had higher posttest achievement score ($\bar{x} = 21.32$) than their counterparts in the conventional instruction ($\bar{x} = 19.07$).

Table 3
Estimated Marginal Means for Treatment and Control Groups

Treatment	Mean	Std. error	95% Confidence Interval	
			Lower Bound	Upper Bound
CRA	21.32	.80	19.74	22.90
Control	19.07	.93	17.25	20.90

Grand Mean = 20.19

H₂: There is significant main effect of gender on students' achievement in mathematics. From Table 4, female students obtained slightly higher achievement mean score ($\bar{x} = 20.66$) than their male counterparts ($\bar{x} = 19.73$). Table 2 shows that that gender has no significant effect on students' achievement in mathematics ($F_{(1, 190)} = .58; p < .05$). Hence hypothesis 2 is, therefore, rejected.

Table 4
Estimated Marginal Means for Male and Female Students

Sex	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Male	19.73	.85	18.06	21.41
Female	20.66	.87	18.94	22.37

Grand Mean = 20.19

H₃: There is interaction effect of treatment and gender on students' achievement in mathematics. From Tables 2 and 5, the interaction effect of treatment and gender

on students' achievement in mathematics is not significant ($F_{(1, 190)} = .01$; $p < .05$). Therefore, hypothesis 3 is rejected.

Table 5
Estimated Means for Males and Females in Experimental (CRAIS) and Control Groups

Treatment	Sex	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
CRAIS	Male	20.92	1.13	18.69	23.15
	Female	21.72	1.12	19.50	23.93
Control	Male	18.55	1.27	16.05	21.04
	Female	19.60	1.34	16.95	22.25

Grand Mean = 20.19

Discussion

Findings of the study revealed that concrete-representational-abstract instructional strategy was more effective at improving students' achievement in mathematics than the conventional strategy. The effectiveness of the CRAIS over the conventional instructional strategy could be due to the fact that CRAIS is learner-centered which provides learners with the opportunity to participate actively in learning. This high level of involvement of learners enabled them to solve real mathematical problems thereby gaining required knowledge which helped them to make meaning from information presented. This is line with the opinion of Devlin (2000) that hands-on experiences allow students to understand how numerical symbols and abstract equations operate at a concrete level, making the information more meaningful to students. This finding also agrees with the submission of Harrison and Harrison (1986) that the use of concrete materials develops more precise and more comprehensive mental representations. This finding corroborates the earlier findings about CRAIS with that of Witzel, Mercer, and Miller (2003); students taught using the CRA sequence of instruction

performed fewer procedural errors in mathematics.

Modified conventional teaching strategy was less effective on students' achievement in mathematics. Several studies in the area of mathematics have shown that instruction, especially at the secondary school level, remains overwhelmingly teacher-centered with greater emphasis being placed on lecturing rather than helping students to think critically across subject areas and applying their knowledge to real-life situation (Butty, 2001). This finding is also in line with Akinsola and Olowojaiye's (2008) finding that the conventional teaching strategy was inadequate for improved students' achievement in mathematics.

The findings on gender show that it has no significant influence on students' achievement in mathematics. Though the female students obtained slightly higher mean achievement score than male students, but the difference was not significant. This study has shown that mathematics is neither a male-dominated nor a female-dominated subject in line with the assumptions of Akinsola and Tijani (1999). This result negates the findings that found significant main effects

of gender on students' achievement in favour of boys (Odogwu, 2002; Ojo, 2003). Findings of this study are in line with others who found no significant relationship between gender and achievement in mathematics (Abiam & Odok, 2006; Hyde & Mertz, 2009; Vale, 2009).

Conclusion

Based on the findings, it could be concluded that the CRAIS, when employed in the teaching and learning of mathematics concepts, has great potential for improving both achievement and attitude of every student towards mathematics. Active participation of students in cutting, modeling, and drawing before symbolic representation of the concepts would not only lead to the achievement of the desired objectives of mathematics learning but would develop greater confidence in students, and this will eradicate the problem of mass failure in mathematics and increase enrollment in science-oriented subjects and improve the technological development of the country. In this case, mathematics teachers should make conscious efforts towards learning

about the CRAIS and adopting it in their teaching.

Recommendations

In order to improve students' achievement in mathematics, strategies which involves active participation of students' in learning such as the CRAIS should be adopted for teaching mathematics to move teachers away from teaching mathematics in abstract. Training and retraining programmes such as seminars and workshops should be organized by government and professional associations like Science Teachers Association of Nigeria (STAN) and Mathematical Association of Nigeria (MAN) for the teachers of mathematics to learn more about CRAIS to improve and enhance students' achievement in mathematics. Teaching materials are very important in teaching and learning of mathematics as well; therefore, the government should purchase these materials and distribute around the schools to make learning real and increase students' level of assimilation.

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The journal (*JISTE*) publishes articles by members of the International Society for Teacher Education (ISfTE). Exceptions are made for a non-member who is a co-author with a member, or who is invited to write for a special issue of the journal, or for other special reasons.

- Articles submitted to *JISTE* must be written in English, following manuscript guidelines (see below) and will be anonymously reviewed by referees. Each article must pass the review process to be accepted for publication. The editors will notify the senior author of the manuscript if it does not meet submission requirements.
 - Articles are judged for (a) significance to the field of teacher education from a global perspective, (b) comprehensiveness of the literature review, (c) clarity of presentation, and (d) adequacy of evidence for conclusions. Research manuscripts are also evaluated for adequacy of the rationale and appropriateness of the design and analysis. Scholarly relevance is crucial. Be sure to evaluate your information. Articles should move beyond description to present inquiry, critical analysis, and provoke discussion.
 - Articles pertaining to a particular country or world area should be authored by a teacher educator from that country or world area.
 - All manuscripts accepted for publication will be edited to improve clarity, to conform to style, to correct grammar, and to fit available space. Submission of the article is considered permission to edit to article.
 - Published manuscripts become the property of the *Society*. Permission to reproduce articles must be requested from the editors. The submission and subsequent acceptance of a manuscript for publication serves as the copyright waiver from the author(s).
- Writing and editorial style shall follow directions in the *Publication Manual of the American Psychological Association* (6th ed., 2009). References MUST follow the APA style manual. Information on the use of APA style may be obtained at www.apa.org.

Manuscript Guidelines

- Manuscript length, including all references, tables, charts, or figures, should be 3,000 to 5,000 words. **Maximum length is 5,000 words.** Shorter pieces of 1500-3,000 words, such as policy review or critique papers are welcomed.
- All text should be double-spaced, with margins 1 inch (2.5 cm) all around and left justified only.
- Paragraphs should be indented using the “tab” key on the keyboard. No extra spacing should be between paragraphs.
- Tables, Figures, and Charts should be kept to a minimum (no more than 4 per article) and sized to fit between 5.5 x 8.5 inches or 14 x 20 cm.
- Abstract should be limited to 100-150 words.
- Include four or five keywords for database referencing; place immediately after the abstract.
- Cover page shall include the following information: Title of the manuscript; name(s) of author, institution(s), complete mailing address, email address, business and home (mobile) phone numbers, and fax number. Also on the cover page, please include a brief biographical sketch, background, and areas of specialisation for each author. Please do not exceed 30 words per author.

Book and Other Media Review Submission

Reviews of books or other educational media are welcome. Either the review or the item reviewed must be by a current member of ISfTE. Reviews must be no longer than 1000 words.

Annotation of Recent Publications by Members Submission

ISfTE members may submit an annotated reference to any book which they have published during the past three years. Annotation should be no longer than 150 words.

Submission Requirements

It is preferred that articles be submitted directly to the editor, Karen Bjerg Petersen at kp@edu.au.dk. To submit an article by email, send it as an attachment using MS Word, if at all possible.

You may also submit by mail by sending a printed manuscript and a copy on either a computer disk or flash drive. Printed manuscripts and storage items will not be returned.

Manuscripts and editorial correspondence should be directed to:

Dr. Karen Bjerg Petersen, Editor, *JISTE*
Niels Juelsgarde 894, bygn 2110
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Email: kp@edu.au.dk

Book Reviews should be directed to:

Dr. Peggy Saunders, Associate Editor, *JISTE*
Weber State University
1351 Edvalson Dr., Dept. 1306
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Future Issues and Submission Deadlines

2015 (Volume 19, Number 2)

Currently an open submission with no specific theme – Members of ISfTE are invited to contribute manuscripts related to any important topic in teacher education. Members are encouraged to co-author articles with their students or colleagues who may not be members of ISfTE. Articles that explore teacher education issues such as the practicum, mentoring in other disciplines (e.g. nursing, adult education, social work education) are particularly invited. Such articles should explore the discourse in relationship to teaching at the elementary, secondary, or tertiary (college/university) level.

Deadline for Submission has passed – Publication by December, 2015

2016 (Volume 20, Number 1)

Theme – Critical Issues for Tomorrow's Teachers

This is the theme for the 35th annual ISfTE seminar sponsored by Montclair State University in New Jersey, USA. It will be held June 21-26, 2015, and abstracts should be submitted in the next couple of months. For JISTE publication, participants (including those from the Distance Paper Group) are invited to revise their seminar papers, attending carefully to the manuscript and publication guidelines, and submit them to the journal for consideration. Book reviews on the theme are also invited.

Deadline for submission: September 1, 2015 – Publication by May, 2016

2016 (Volume 20, Number 2)

Currently an open submission with no specific theme – Members of ISfTE are invited to contribute manuscripts related to any important topic in teacher education. Members are encouraged to co-author articles with their students or colleagues who may not be members of ISfTE. Articles that explore teacher education issues such as the practicum, mentoring in other disciplines (e.g. nursing, adult education, social work education) are particularly invited. Such articles should explore the discourse in relationship to teaching at the elementary, secondary, or tertiary (college/university) level.

Deadline for Submission: April 1, 2016 – Publication by December, 2016

Front cover: These institutions' logos appear on the front cover of this issue:

Hacettepe University (HUT) is one of the largest universities in Turkey with over 30,000 students and 3,500 academic staff. The university was established in 1967 and currently has 13 Faculties, 13 Institutes, 2 Schools, 1 Conservatory, 6 Vocational Schools, 41 Research and Application Centres.

The Faculty of Education has 16 programmes under five departments (Computer Education and Instructional Technology, Educational Sciences, Secondary Science and Mathematics Education, Foreign Language Education, and Elementary Education).

Aarhus University is the second oldest university in Denmark. It is also the largest university in the country with over 43,000 students. It offers programmes in both undergraduate and graduate studies. Although the main campus is in the city of Aarhus, Denmark, the university has small campuses in Copenhagen and Herning.

Hong Kong Baptist University was founded by the Baptist Convention of Hong Kong in 1956 as a post-secondary college and became a fully-fledged university in 1994. It now boasts eight faculties and schools and an academy offering a wide range of undergraduate and postgraduate programmes to around 8,400 students.

Weber State University in Ogden, Utah, United States, was founded in 1889. It is a coeducational, publicly supported university offering professional, liberal arts, and technical certificates, as well as associate, bachelor's, and master's degrees. Currently, over 25,000 students attend the university.