Teaching Methods in Pre-Service Secondary Teacher Education and the Development of Critical Thinking Skills in Cameroon

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Abstract: *Education aims at creating learners who have the appetite to think analytically and critically, to use their knowledge to enhance their own lives and also contribute to their society, culture and civilization. If Cameroon must achieve its Vision of attaining emergence in 2035, the curriculum must be improved to accommodate critical thinking or problem-solving skills. Teachers must have a critical thinking skills to equip students with critical thinking skills through teaching methods. In Cameroon, it is not known if critical thinking in teacher education has been given adequate attention. Thus the study sets out to make an evaluation of the secondary teacher education programmes in Cameroon with respect to the use of methods that enhance critical thinking. The study was a descriptive survey with a sample of 300 final year student-teachers of public general and technical secondary teacher education institutions in Cameroon. Data were collected through a questionnaire and were analysed inferentially. Findings and recommendations are discussed*

Keywords: Secondary grammar teacher education, secondary technical teacher education, critical thinking, higher order thinking, teaching methods, Cameroon

1. Introduction

One of the aims of education is to create learners who have the appetite to think analytically and critically, to use their knowledge to enhance their own lives and also to contribute to their society, culture and civilization. Critical thinking, creative thinking and problem solving are considered necessary skills for 21st century individuals (Kalelioğlu & Gülbahar, 2014). Several popular definitions of critical thinking contain the following cognitive elements: identifying central issues and assumptions, making correct inferences from data (Willingham, 2007) deducing conclusions from data provided, interpreting whether conclusions are warranted, and evaluating evidence or authority (ACTA, 2014; Case, 2005 and Elder and Paul, 2006), many of them drawing from the cognitive domain of Bloom's Taxonomy of educational objectives; hence, it is a must have skills for effective problem-solving and decision-making in all walks of life—social, clinical, ethical, managerial, or political (Simpson & Courtney, 2002).

The onus of equipping students with critical thinking skills rests on teachers who must have the competencies themselves. There is a general consensus that teacher education is the bedrock of any educational system. It is the "primary determinant" of quality education (Isyaku, 2002). If Africa must make the highly desired advancement in democracy, science and other sectors, teacher education curriculum must be improved to accommodate critical thinking (Ijaiya, Alabi, & Fasasi, 2010). The question of whether teaching methods in teacher training programs enhance critical thinking skills in teachers in Cameroon has not been given attention. The study thus aims at finding out the extent to teaching methods in initial secondary teacher education programs equip trainees with critical thinking skills.

2. Review of Literature

Developing the students' ability to think critically is influenced by the teachers' competence and approach to teaching (Simpson & Courtney, 2002). If teachers aim to prepare students at a higher level of cognitive thinking, they must first emulate higher level thinking in their instructional practices (Ball & Garton, 2005). Students need to be exposed to diverse teaching methods that promote critical thinking in order to nurture the critical thinking process (Walker, 2003).

Gul et al., (2014) report that although there is no one right way to teach or assess critical thinking, literature suggests that teaching approaches that require active students' involvement instead of didactic teaching practices are critical to promote and facilitate critical thinking (Simpson & Courtney, 2002; Velde et al., 2006).

Teaching strategies such as problem-based learning, writing reflective journals, role-playing, concept-mapping, and debates are reported to help (Simpson & Courtney; Velde et al., 2006; Yang & Chou, 2008) because these strategies help engage students in their learning process and can foster their critical thinking dispositions (eg inquisiveness, analytical abilities, reasoning skills, self-confidence, and open-mindedness; Chan, 2012; Vacek, 2009; Velde et al., 2006). Explanations of abstract concepts and well organized presentations are found to impact students' critical thinking as well (Shim & Walczak, 2012). Since critical thinking is a social learning process, students can learn it from their peers and faculty modeling (Brookfield, 2012).

Clasen and Bonk (1990) also posited that although there are many strategies that can impact students' thinking, it is the teachers' questions that have the greatest impact. Research evidence consistently suggests a direct relationship between the types of questions posed by faculty and the students' ability to develop critical thinking (Rossignol, 2000; Shim &

Walczak, 2012). Higher level cognitive questions require learners to manipulate information to create and support responses, while lower level cognitive questions are answered through recall, recognition, and simple application of information. An assortment of questioning tactics exists to promote critical thinking. Depending on how a question is asked, the student may use various critical thinking skills such as interpretation, analysis, and recognition of assumptions to form a conclusion (Walker, 2003). In addition to questioning, he believes that classroom discussions and debates with written assignments enhance critical thinking. In-class and out-of-class assignments can also serve as powerful vehicles to allow students to expand their thinking processes. Students can be challenged with two sides of an argument or controversial issues can be presented and discussed.

Ijaiyi, Alabi and Fasasi (2010) summarize instructional methods that enhance critical thinking as follows: Classroom assessment techniques; Cooperative learning strategies which involve putting students in groups for brainstorming and discussion but guided by the teacher and students; Case study/Discussion method which involves presenting a case to students to discuss and allowing them to infer conclusions; Use of questions: Reciprocal peer questioning and reader's questioning; Conference style learning: The approach is to allow students to operate as if in a conference while the lecturer simply facilitates. Students must have prepared well and ask each other questions and discuss; Written assignments which encourage students to do written assignments with questions requiring arguments on both sides; Dialogues where they could be in written form whereby students would analyze written dialogues in groups.

3. Statement of the Problem

Teachers are able to foster critical thinking only to the extent that they themselves think critically. This may be the single most significant barrier to student achievement of critical thinking competencies. With a vision to attain emergence in Cameroon, it is important to ensure that students have the cognitive skills that drive development. Unfortunately, the question of whether pre-service teachers themselves are being taught to think critically has not been given adequate attention in Cameroon. This is important because there is a tendency that teachers will only teach in the manner in which they were taught.

Hypotheses
- Teaching methods in secondary teacher education programs do not enhance critical thinking skills
- There is a significant difference in the use of teaching methods that enhance critical thinking skills between secondary general teacher education programs and secondary technical teacher education programs

4. Methodology

Research Design
The study was a descriptive survey which made use of a quantitative method of data collection. The target population for the study consisted of 300 public general and technical secondary school teacher trainees in two teacher training institutions in Cameroon namely ENS Yaounde for secondary grammar teacher education and ENSET Douala for secondary technical teacher education. The random sampling technique was used in selecting the institution as well as the participants.

Data Collection and Instruments
A closed-ended 20-item likert scale questionnaire was the instrument for data collection. The aim of the questionnaire was to investigate whether teaching methods used in the teacher education programmes enhance critical thinking and if the general and technical secondary teacher education programmes differ in the use of methods that enhance critical thinking. Participants were expected to rate items on a three-point scale ranging from Always, Sometimes to Never. Each point was given a value ranging from 3, 2, 1 respectively. The higher the value of the response the more positive was the answer. The reliability estimates ranged from 0.83 to 0.85. This was analyzed inferentially using the product Moment Correlation Coefficient and the Independent t-test.

5. Findings

Hypothesis one
Teaching methods in secondary teacher education programs do not significantly enhance critical thinking skills
The independent variable in this hypothesis is the teaching methods in the teacher education program, while the dependent variable is critical thinking skills among teacher trainees. The statistical analysis technique used to test this hypothesis was the Pearson Product Moment Correlation analysis.

The result of the analysis is presented in Table 1

Table 1: Pearson Product Moment Correlation analysis of the effect of teaching methods in teacher education program on the enhancement of critical thinking skills (N=240)

Variable	$\sum X$ $\sum Y$	$\sum X^2$ $\sum Y^2$	$\sum XY$	Γ_{xy}
Teaching methods in teacher education program	8991	341003	76073	0.012
Enhancement of critical thinking skills	2030	17532		

p*<0.05; df=238; critical Γ_{xy} =0.098

The result of the analysis reveals that the calculated Γ_{xy} -value of 0.012 is less than the critical Γ_{xy} -value of 0.098 at .05 level of significance with 238 degrees of freedom. With the result of the analysis, the null hypothesis was retained and the alternative hypothesis rejected. This result therefore means that teaching methods in secondary teacher education programs do not significantly enhance critical thinking skills in teacher trainees.

Hypothesis Two
There is no significant difference in the use of teaching methods that enhance critical thinking skills between secondary general teacher education programs and secondary technical teacher education programs.

The respondents in the sample were categorized into two groups based on the teacher education programs.
Group 1: Secondary General Teacher Education
Group 2: Secondary Technical Teacher Education

The data collected for the enhancement of critical thinking skills in the two teacher education programs was got from the questionnaire administered to the students. The statistical analysis technique used to test this hypothesis was the independent t-test. The result of the analysis is presented in Table 2

Table 2: Independent t-test analysis of the difference in the use of teaching methods that enhance critical thinking skills between secondary general teacher education programs and secondary technical teacher education programs (N=160)

Region	N	Mean	SD	t-value	p-value
Secondary General	170	22.18	3.78	18.40	0.00
Secondary Technical	130	31.84	1.59		
Total	300	25.62	2.28		

*$p<0.05$, df=158; critical t = 1.97

The result of the analysis of the data collected from the test showed that the p-values for level of numeracy (p = 0.00) is lower than the significance level of 0.05 with 158 degrees of freedom. The null hypothesis is therefore rejected. This means that there is a significant difference in the use of teaching methods that enhance critical thinking skills between secondary general teacher education programs and secondary technical teacher education programs. Given these results the mean scores for critical thinking for the two teacher education programs were compared. The mean score for the secondary technical teacher education programs (mean = 31.84) was found to be higher than the mean score for secondary general teacher education programs (mean = 22.18). Therefore teaching methods in secondary technical teacher education programs enhance critical thinking skills more than teaching methods in secondary general teacher education programs.

6. Discussion

Findings reveal that teaching methods in teacher education programmes do not adequately enhance critical thinking and they differ in the extent to which critical thinking is enhanced, with the secondary technical teacher education programmes doing better than the secondary grammar teacher education programmes which means that future technical education students may constitute a better workforce. Critical thinking is very important to participate effectively in a democratic society with a set of skills useful in workplace decision making, leadership, clinical judgment all of which directly affect professional success (Onions, 2009). The difference in enhancing critical thinking skills in both institutions may be due to the emphasis on the skills component of the training which incorporates application, analysis, synthesis through practicals in technical teacher education programmes. Whatever the case the grammar school programmes which emphasize knowledge are expected to enhance critical cognitive skills which include critical thinking skills like interpretation, application, analysis, and recognition of assumptions to form a conclusion (Walker, 2003).

One of the aims of education is to create learners who have the appetite to think analytically and critically, to use their knowledge to enhance their own lives and also to contribute to their society, culture and civilization. Teachers are able to foster critical thinking only to the extent that they themselves think critically and there is a tendency that a teacher will only teach in the manner in which they were taught. Therefore, students may not develop critical thinking because their teachers were not trained to think critically. Without critical thinking on the part of teachers and students Cameroon may not realize Vision 2035 aimed at making Cameroon a middle-income country and reducing poverty. If Cameroon must make the highly desired advancement in democracy, science and other sectors, teacher education curriculum must be improved to accommodate critical thinking.

7. Conclusion

Teacher education programmes do not adequately use teaching methods that enhance critical thinking. Teacher educators must consciously enhance critical thinking. Teaching and assessment strategies are important in enhancing critical thinking. Gul et al., (2014) report that although there is no one right way to teach or assess critical thinking, literature suggests that teaching approaches requiring active students' involvement instead of didactic teaching practices are critical to promote and facilitate Critical Thinking (Simpson & Courtney, 2002; Velde et al., 2006). Teaching strategies such as problem-based learning, writing reflective journals, role-playing, concept-mapping, and debates are reported to help (Simpson & Courtney; Velde et al., 2006; Yang & Chou, 2008) because these strategies help engage students in their learning process and can foster their critical thinking dispositions (eg inquisiveness, analytical abilities, reasoning skills, self-confidence, and open-mindedness; Chan, 2012; Vacek, 2009; Velde et al., 2006). Explanation of abstract concepts and well organized presentations are found to impact students' critical thinking as well (Shim & Walczak, 2012). Since critical thinking is a social learning process, students can learn it from their peers and faculty modeling (Brookfield, 2012). Questions also constitute another important strategy. Higher level cognitive questions require learners to manipulate information to create and support responses, while lower level cognitive questions are answered through recall, recognition, and simple application of information. An assortment of questioning tactics exists to promote critical thinking. Depending on how a question is asked, the student may use various critical thinking skills such as interpretation, analysis, and recognition of assumptions to form a conclusion (Walker, 2003).

References

[1] Ball, A. L., & Garton, B. L. (2005). Modeling higher order thinking: The alignment between objectives, classroom discourses, and assessment. *Journal of Agricultural Education*, 46,58-69. doi:10.5032/jae.2005.02058

[2] Brookfield, S. D. (2012). Teaching for critical thinking: Tools and techniques to help students question their assumptions. San Francisco, CA: Jossey-Bass

[3] Chan, Z. C. Y. (2012). Role playing in problem-based learning class. Nurse Education in Practice, 12(1), 21-27. doi:10.1016/j.nepr.2011.04.008

[4] Clasen, D. R., & Bonk, C. (1990). Teachers tackle thinking. Madison, WI: Wisconsin Education Extension Program.

[5] Elder, L., & Paul, R. (2006). Critical thinking... and the art of substantive writing, part II. Journal of Developmental Education, 29(3), 38-39.

[6] Gul, R.B., Klan, S., Ahmed, A., Cassum, T.S., Parpio, Y., McGrath, J.P and Schopflocher, D. (2014).Enhancing Educators' Skills for Promoting Critical Thinking in Their Classroom Discourses: A Randomized Control Trial. *International Journal of Teaching and Learning in Higher Education 6, (1)37-54*

[7] Ijaiya, N. Y. S., Alabi, A. T., & Fasasi, Y. A. (2010). Teacher education in Africa and critical thinking skills: Needs and strategies. Social Sciences, 5(4), 380 385

[8] Kalelioğlu, F., & Gülbahar, Y. (2014). The Effect of Instructional Techniques on Critical Thinking and Critical Thinking Dispositions in Online Discussion. Educational Technology & Society, 17 (1), 248–258.

[9] Onions, P. E. W. (2009). Thinking critically: An introduction, working paper. Retrieved on February 2, 2012 from http://www.patrickonions.org/docs/academic/2009%20 Thinking%20critically.pdf

[10] Rossignol, M. (2000). Verbal and cognitive activities between and among students and faculty in clinical conferences. Journal of Nursing Education 39, 245-250.

[11] Shim, W., & Walczak, K. (2012).The impact of faculty teaching practices on the development of students' critical thinking skills. International Journal of Teaching and Learning in Higher Education, 24(1), 16-30. Retrieved fromhttp://www.isetl.org/ijtlhe/pdf/IJTLHE1128.pdf

[12] Simpson, E., & Courtney, M. (2002). Critical thinking in nursing education: Literature review. International Journal of Nursing Practice, 8, 89-98.doi:10.1046/j.1440- 172x.2002.00340.x

[13] Vacek, J. E. (2009). Using a conceptual approach with concept mapping to promote critical thinking. *Educational Innovations,* 48(1), 45-48. doi:10.3928/01484834-20090101-11

[14] Velde, B. P, Wittman, P. P., &. Vos, P. (2006). Development of critical thinking in occupational therapy students. Occupational Therapy International, 13(1), 49-60. doi:10.1002/oti.20

[15] Walker, S.(2003). Active Learning Strategies to Promote Critical Thinking Journal of athletic training 38(3):263-7. Retrieved from https://www.researchgate.net/publication/7219979_Acti ve_Learning_Strategies_to_Promote_Critic al_Thinking

[16] Yang, Y. C., & Chou, H. (2008). Beyond critical thinking skills: Investigating the relationship between critical thinking skills and disposition through different online instructional strategies. British Journal of Educational Technology, 39(4), 666-684. doi:10.1111/j.1467