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## **Pre-Service Teachers' Knowledge of Continuous Assessment Techniques in Ghana**

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### **Abstract**

The study determined pre-service teachers' status of training and their levels of knowledge in continuous assessment procedures. Eight hundred and sixty-six second year pre-service teachers, made up of 329 females and 537 males, from 24 teacher-training colleges participated in the study. The study was a cross-sectional survey and data was collected using a questionnaire. An alpha level of 0.05 was used for all statistical tests. The results showed that the majority (60%) of the respondents had no training in continuous assessment. The majority (63%) of those who had had the training responded that it was adequate and that they had been well prepared. It was found that the techniques that were least taught were the personal observations and class projects. The study shows that pre-service teachers' level of knowledge in continuous assessment is low. It is recommended that the teacher education curriculum planners make courses in assessment a priority in the first two years during their pre-service training.

One of the earliest attempts to draw attention to teachers' knowledge and skill in classroom assessment was made by Noll (1955). In a survey of 108 experienced classroom teachers in the United States, he found that teachers demonstrated a serious lack of understanding of the basic concepts in classroom assessment. Further studies confirmed this finding. Mayo (1967), in a large scale national study in the United States of America, administered a Measurement Competency Test to 2,877 graduating seniors in 86 teacher training institutions. Mayo concluded from his study that beginning teachers did not possess adequate knowledge and skills to enable them to succeed in meeting classroom assessment responsibilities. He suggested that the lack of deep commitment to problems and practices in evaluation and a negative attitude toward statistics were two possible obstacles impeding the improvement of the measurement (and assessment) competency of teachers.

Recent studies in the USA have found that the trend of inadequate knowledge of classroom assessment principles and skills has not changed. Boothroyd, McMorris, and Pruzek (1992) studied 41 seventh and eighth grade science and mathematics teachers. These teachers represented 25 public and private school districts from many geographic regions in the state of New York. They examined a sample of approximately 350 multiple-choice and completion items submitted by the teachers. They found that teachers' knowledge of measurement was not adequate and attributed this deficiency to inadequate training in measurement given at the pre-service teacher education level. Plake, Impara, and Fager, (1993) also reported from a USA National Council on Measurement and Evaluation (NCME)-sponsored national survey of elementary, middle and secondary level teachers and administrators from 98 school systems that almost 30% of the teachers reported that they had no training at all in tests and measurement. They further observed that teachers who completed a course or in-service training programme in measurement had higher scores on a measurement competency test than did those without such background.

In Ghana, Amedahe (1989) in a study of the assessment practices of secondary school teachers in the Central Region found that teachers lacked the skills and principles of test construction. In a study of student assessment procedures in junior secondary schools in 11 districts in the country, it was also found that teachers did not have adequate training in continuous assessment procedures (CRDD, 1999). It was reported that 55% of the teachers interviewed felt they were not confident to practice continuous assessment in schools because they did not have any training.

Continuous assessment was introduced into the basic (primary and junior secondary) schools in Ghana in 1987 with the purpose of reducing the over reliance on summative evaluation where a pupil's attainment in a subject was measured by a single-shot examination. With continuous assessment, a pupil's performance in school is to be spread over various sources and procedures. The final grade given to a pupil is believed to be more representative of the pupil's overall performance than a single end-of-term examination.

As a matter of policy, the Ministry of Education in Ghana expects each teacher to (a) give class assignments/exercises fortnightly and record the scores of four of them with a maximum score of 10 each, (b) conduct three class tests in a term with a subtotal of 40, and (c) give pupils projects/homework in a term and record the scores of four of them with a subtotal of 20. The three assessments give a total score of 100, which is scaled down to 30% as the internal mark for each pupil. The end of term examination is given 70%. At the end of the junior and senior secondary schools, all the scores a pupil obtains are scaled to 30% and forwarded to the West African Examinations Council (WAEC) as the continuous assessment component of the final grade in each subject. WAEC provides 70% as the external assessment component of the final grade in each subject.

Evidence has been found that in-service teachers in Ghana have limited competency in assessment in general, and continuous assessment in particular (Amedahe, 1989; Curriculum Research Development Division, 1999). The lack of skills and knowledge is partly attributed to their inability to receive training in assessment procedures in the teacher training colleges as teacher trainees or pre-service teachers. These pre-service teachers teach in the basic schools in the country on the completion of their teacher education programme. Currently, no research has been identified in Ghana on pre-service teachers' knowledge of continuous assessment procedures.

The purpose of this study therefore was to determine the status of training and the level of knowledge in continuous assessment procedures of the pre-service teachers. Specifically, the study sought to answer the following questions: (a) What is the status of training in continuous assessment procedures for pre-service teachers? (b) How prepared are the pre-service teachers to undertake continuous assessment when posted to a new station? (c) How adequate was the training in continuous assessment for pre-service teachers who were trained? (d) Which continuous assessment techniques were pre-service teachers well trained in to be used at their stations as newly trained teachers? (e) What is the level of knowledge in continuous assessment for pre-service teachers? (f) What difference exists (if any) in the level of knowledge in continuous assessment between pre-service teachers who received training and those not trained?

## Method

### Participants

Eight hundred and sixty-six second year (PS2) pre-service teachers participated in this study. There were 329 females and 537 males. The pre-service teachers were selected from 24 public teacher-training colleges out of the 38 public teacher-training colleges in the country. The selection of the pre-service teachers was done through two-stage sampling. The first stage involved randomly selecting two public teacher-training colleges in each of the ten regions. In regions where there were only two teacher training colleges, both of them were taken. However, in the Ashanti and Eastern Regions where there were more teacher training colleges, four colleges were randomly selected from both. The second stage involved randomly selecting one second-year (PS2) class out of the number of classes in each college. All the students in the selected classes constituted the sample.

### Research Design

This study was designed as a cross-sectional survey that collects information at just one point in time. Surveys enable an examination of “large and small populations (or universes) by selecting and studying samples chosen from the populations to discover the relative incidence, distribution, and interrelations of sociological and psychological variables” (Kerlinger, 1986, p. 377). The major variables were the status of training, preparedness to practice continuous assessment, adequacy of training in continuous assessment and the level of knowledge in continuous assessment. To accomplish the objectives of the study, a questionnaire was used to collect the data in February and March 2002.

### Instrument

A three-section questionnaire was developed for the study. Section A requested information on training in continuous assessment procedures, Section B dealt with the level of knowledge of continuous assessment, and Section C was on the perceptions of continuous assessment. The "level of knowledge" section consisted of a twenty-item multiple-choice knowledge test on continuous assessment. The instrument had a Cronbach's alpha of 0.82 as the estimate of its reliability. Content validity was achieved through reviews and revisions of the draft questionnaire before and after a pilot study. Final year students and a lecturer in educational measurement did this from the Department of Educational Foundations, University of Cape Coast.

The items on the knowledge test included items on policy on continuous assessment in Ghana, characteristics of continuous assessment, weaknesses and strengths, and the practice of continuous assessment. The first seven items were multiple-choice items. The second set of 13 items requested participants to indicate their level of knowledge (very high, high, moderate, low, no knowledge) concerning specified areas of continuous assessment. In scoring the responses, one point was given to each correct option selected on items 1 to 7. For items 8 to 20, one point was given to the 'very high' and 'high' options, one-half point to 'moderate' option and no point to 'low' and 'no knowledge' options. A total score out of a maximum of 20 was obtained for each participant by summing up all the scores of that participant.

In the development of the questionnaire, literature on continuous assessment was first reviewed. A list of items were produced and given to a group of 48 final year (Level 400) students in the Department of Educational Foundations to study and comment on. On the basis of their comments, the statements were reviewed and a second list comprising multiple-choice items as well as likert-scale statements were produced and developed into the questionnaire. The questionnaire was administered to the second-year (PS2) pre-service teachers at OLA teacher training college in Cape Coast as a pilot study. The responses to the items were analysed and the final instrument made.

## Procedure

Data collection was done in February and March 2002. Twenty-four teams consisting of two trained research assistants each were sent to the teacher training colleges after permission had been obtained from the principals of the training colleges. The questionnaire was completed at one sitting and under testing conditions. Instructions were read to the participants and they were given 30 minutes to complete the test and the questionnaire. The participants were assured of the confidentiality of the results. For the sake of anonymity, participants were told not to write their names on the questionnaire. It was stressed to them that no one known to them would have access to the results of the study, and that their names would not be associated with the results. All the 866 participants returned their questionnaires. After the data had been coded and cleaned, 843 participants' responses were valid for analysis giving a 97% response rate.

## Results

1. What is the status of training in continuous assessment procedures for pre-service teachers?

Eight-hundred and eighteen second-year pre-service teachers responded to the item on the status of training. About 40% of the pre-service teachers reported that they had training in continuous assessment procedures and about 60% responded that they had no training in continuous assessment procedures. The result is presented in Table 1.

It could be said that the majority of the teacher-trainees reported that they had no training in continuous assessment procedures. For the 40% that had training, almost 81% reported that they had the training between 1 and 3 times and a further 94% reported that the training lasted between 1 and 4 weeks.

Table 1  
Training in continuous assessment procedures

Response	Frequency	%
Yes	330	40.3
No	508	59.7
Total	818	100

From the teacher-trainees' reports, most (18 out of 24 or 75%) teacher -training institutions had not provided training in continuous assessment techniques to their students by the middle of the second year. This is considered serious because the students would be going out on teaching practice by the beginning of the third year on the IN-IN-OUT programme. The third term of the second year may not provide adequate time to cover theory and practice in assessment techniques. Pre-service teachers would therefore go out into the practice teaching with very little or no knowledge of continuous assessment techniques and procedures.

2. How prepared are the pre-service teachers to undertake continuous assessment when posted to a new station?

Pre-service teachers were also asked to indicate how prepared they were to practice continuous assessment when posted to a new station. Seven hundred and forty-six participants responded to the item. The result is presented in Table 2.

Table 2  
Preparedness of pre-service teachers to practice continuous assessment

Level of Preparedness	Frequency	%
Not prepared	212	28.4
Quite prepared	216	29.0
Well prepared	170	22.8
Very well prepared	148	19.8
Total	746	100.0



About 43% reported that they were either well prepared or very well prepared to practice continuous assessment procedures when posted to a new station. About 57% felt they were not well prepared to practice continuous assessment procedures. This report confirms the status of training where about 40% of the pre-service teachers reported that they had training in continuous assessment procedures. The small difference (3%) could be attributed to the effect of self-reporting.

3. How adequate was the training in continuous assessment for pre-service teachers?

The three hundred and thirty participants who had training in continuous assessment procedures were further requested to indicate how adequate the training was in preparing them to practice continuous assessment as newly trained teachers. Three hundred and ten participants out of the 330 responded to the item. The result is presented in Table 3. Thirty-seven percent felt that the training was either fairly adequate or not adequate. On the other hand, 63% responded that the training was adequate and very adequate.

Table 3

Adequacy of training in continuous assessment procedures

Level of Adequacy	Frequency	%
Not adequate	42	13.5
Fairly adequate	72	23.2
Adequate	127	41.0
Very adequate	69	22.3
Total	310	100.0

Since about 60% agreed that the training was adequate, it means that it is possible to provide the training to the pre-service teachers by the end of the second term of the second year. What is needed is for the training colleges to re-prioritise their activities and programmes to provide time for training in assessment techniques and procedures during the first and second years when the teacher-trainees are in college, before they go out.

4. Which continuous assessment techniques were pre-service teachers well trained in to be used at their stations as newly trained teachers?

Teacher-trainees who went through training were asked to indicate which assessment techniques they were well trained in as beginning teachers. The percentage responses are presented in Table 4.

Table 4  
Percentage responses on level of training in continuous assessment techniques

Type of technique	Level of Training				Total
	Very well	Well	Quite well	None	
Essay tests	36.5%	29.4%	22.3%	11.8%	100% (296)
Multiple-choice tests	38.6%	29.5%	25.1%	6.8%	100% (295)
Short-answer tests	37.2%	33.7%	24.2%	4.9%	100% (285)
True-false tests	49.7%	21.6%	21.2%	7.5%	100% (292)
Matching-type tests	34.8%	29.0%	25.7%	10.5%	100% (276)
Personal Observations	25.9%	25.5%	31.5%	17.0%	100% (270)
Class Projects	17.9%	23.0%	25.5%	22.4%	100% (285)

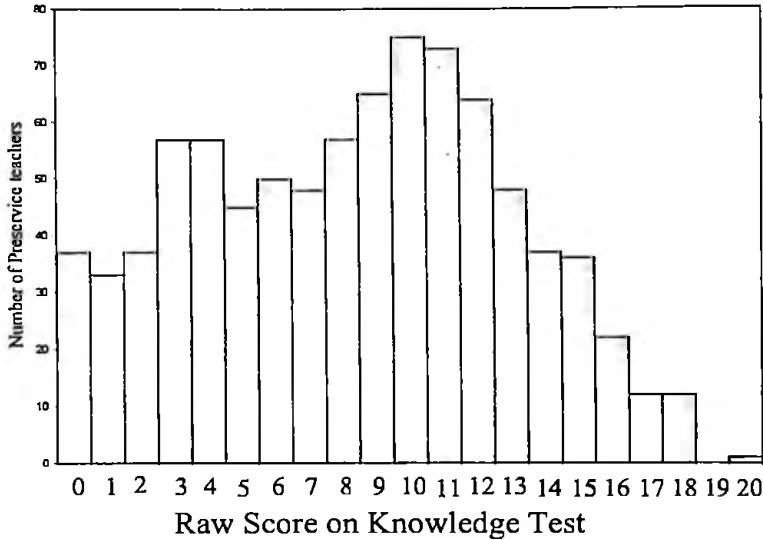
From the pre-service teachers' responses, it could be observed that more than 60% reported that they were well trained or very well trained in the use of essay tests, multiple-choice tests, short-answer tests, true-false tests, and matching-type tests. On the other hand, about 51% reported that they were well trained or very well trained in personal observations,

and about 41% reported that they were well trained or very well trained in the use of class projects. It could therefore be reported that on the basis of pre-service teachers' self reports, the techniques they were not well trained in were personal observations and class projects.

5. What is the level of knowledge in continuous assessment for pre-service teachers?

Eight-hundred and forty-three pre-service teachers responded to the test items. The result is presented in Figure 1 and Table 5. The overall mean for the knowledge test was 51.7% (10.3 out of 20.0) with a standard deviation of 21.2. A one-sample t-test was conducted to test the statistical significance of the overall mean. A test value of the expected mean of 50.0% for the combined group of 24 colleges as well as for the individual colleges was used.

The overall result was significant,  $t(842) = 2.72$ ,  $p < 0.05$  implying that performance was just above the expected mean of 50.0. However the difference of 1.7% (i.e., 51.7% - 50.0%) is too small to be of practical significance. The effect size is 0.08 and this is considered negligible. An effect size of 0.5 and above is often considered to be of practical significance. It can, therefore, be argued that pre-service teachers' level of knowledge in continuous assessment, on the basis of pooled results from all the 24 colleges, is just average.



**Figure 1.** Performance of pre-service teachers on continuous assessment knowledge test

The distribution of the histogram (Figure 1) is skewed to the right, showing that the majority of the teacher-trainees tended to obtain low scores. In fact about 61% of them had scores at 12 (out of 20) or below.

For the individual training colleges, only 7 out of the 24 colleges had significant positive results (see Table 5). However, considering the effect sizes, a value of 0.5 and above can be considered to be of practical significance. Thus only students of 4 of the 24 colleges could be said to have an appreciable knowledge in continuous assessment techniques and procedures. The performance of the students from the 4 training colleges caused the overall mean to show that the general performance was average. On the whole, however, it could be stated that pre-service teachers' level of knowledge in continuous assessment was low.

Table 5

Results of the pre-service teachers performance on continuous assessment knowledge test

Serial No. of College	N	Mean	SD	t-value	p-value	Effect size
College 1	29	46.29	22.62	-0.882	0.385	-0.16
College 2	43	48.31	21.37	-0.517	0.608	-0.08
<b>College 3*</b>	<b>36</b>	<b>67.08</b>	<b>13.29</b>	<b>7.713</b>	<b>0.00</b>	<b>1.29</b>
College 4	34	40.96	21.34	-2.471	0.019	-0.42
College 5	31	49.03	20.6	-0.262	0.795	-0.05
College 6	47	42.13	23.64	-2.283	0.027	-0.33
<b>College 7</b>	<b>44</b>	<b>58.07</b>	<b>19.92</b>	<b>2.687</b>	<b>0.01</b>	<b>0.41</b>
<b>College 8*</b>	<b>29</b>	<b>71.55</b>	<b>13.05</b>	<b>8.894</b>	<b>0.00</b>	<b>1.65</b>
<b>College 9*</b>	<b>35</b>	<b>61.21</b>	<b>13.59</b>	<b>4.882</b>	<b>0.00</b>	<b>0.82</b>
College 10	36	57.92	16.12	2.947	0.006	0.49
College 11	39	54.42	20.09	1.375	0.177	0.22
College 12	28	47.14	24.6	-0.615	0.544	-0.12
College 13	32	55.55	18.76	1.673	0.104	0.30
College 14	41	42.5	22.6	-2.125	0.04	-0.33
College 15	24	52.08	17.63	0.579	0.568	0.12
College 16	31	57.5	18.04	2.315	0.028	0.42
College 17	37	55.07	16.5	1.868	0.07	0.31
College 18	23	46.2	17.29	-1.056	0.303	-0.22
College 19	38	47.5	20.29	-0.759	0.452	-0.12
College 20	39	51.73	24.56	0.44	0.662	0.07
College 21	40	46.13	20.19	-1.214	0.232	-0.19
College 22	42	41.01	21.13	-2.757	0.009	-0.43
<b>College 23*</b>	<b>40</b>	<b>62.69</b>	<b>16.3</b>	<b>4.922</b>	<b>0.000</b>	<b>0.78</b>
College 24	25	38.9	21.08	-2.633	0.015	-0.53
Total	843	51.66	21.21	2.273	0.023	0.08

Note. Colleges in bold have significant positive results.

Colleges with asterisks (\*) have acceptable significant effect sizes.

6. What difference exists (if any) in the level of knowledge in continuous assessment between pre-service teachers who received training and those not trained?

Eight hundred and eighteen pre-service teachers provided information for the question. The result is presented in Table 6. The independent t-test for equality of means shows a significant result,  $t(783) = 6.942$ ,  $p < 0.05$ . This implies that those who had training performed better than those who did not have training in continuous assessment procedures. The training can be said to be valuable as a preparation for using assessment procedures after training.

Table 6  
Test of equality of means for trained and untrained pre-service teachers

Status	N	Mean	SD	t	df <sup>a</sup>	p-value
Trained	330	57.8	18.2	6.942	783	0.000
Not trained	488	48.0	22.0			

<sup>a</sup>Degrees of freedom reduced because Levene's test shows violation of homogeneity of variance assumption.

Discussion .

The results of the study have shown that the current status of training in continuous assessment procedures is low. The results have further shown that pre-service teachers are generally not prepared to undertake continuous assessment as beginning teachers. The results have therefore confirmed fears that training in assessment procedures, especially continuous assessment is limited for the pre-service teachers. This is contrary to what Etsey (1992) emphasised:

The teacher needs to be knowledgeable about continuous assessment. He must know the characteristics of continuous assessment, the strengths and weaknesses of the system as a procedure for assessing students' knowledge, attitude and manipulative skills. He must clearly understand and accept his roles and responsibilities as outlined by the programme, and be willing to contribute to its successful implementation. (p. 85)

The results of the study showed that about 60% of the pre-service teachers had had no training in continuous assessment procedures by the middle of the second year in the three years they spent in the training colleges. A further 57% reported that they were not well-prepared to practice continuous assessment procedures when posted to a new station. They therefore lacked the knowledge about continuous assessment to be able to contribute to its successful implementation in Ghana. What makes the matter more serious is the fact that the IN-IN-OUT policy implies that they may not have the opportunity to study the content of continuous assessment in their final year. The students are however expected to practice the continuous assessment procedures when they are out on the practice teaching.

As Borg, Worthen, and Valcarce (1986) stated, studies in continuous assessment courses are to prepare the future basic school classroom teachers to construct and use appropriate assessment techniques for their instructional purposes and to understand how to interpret and communicate student performance on the assessments. It is quite disturbing then that though classroom assessment has been found to be a necessary part of the teaching and learning process, very little or no effort has been put into giving courses in continuous assessment a priority at the teacher training institutions to enable pre-service teachers acquire adequate skills in assessment before they go out to teach. From the pre-service teachers' reports, it is sad to know that 75% of them had not even been shown the Termly Assessment Plan being used by teachers for continuous assessment in the basic schools.

It is heart-warming to find that for the small percentage that had training in continuous assessment procedures, the majority (63%) felt that the training was adequate. Sixty-one percent also reported that they were in a position to successfully practice continuous assessment as newly trained teachers. On the basis of the comments from the trainees, the lessons in continuous assessment were effective. This implies that it is probably not the lack of expertise on the part of the teacher training staff that little attention is given to assessment issues in the teacher training colleges but possibly misplaced priorities.

The teacher-trainees, who had training in continuous assessment, reported that they were well trained in the construction and use of essay-type tests, multiple-choice tests, short-answer tests, true and false tests and matching-type tests as continuous assessment techniques.

They were however not trained in the use of personal observations and class projects. It appeared that the teacher training college tutors avoided teaching the use of personal observations and class projects perhaps due to lack of expertise in those areas. In-service training in continuous assessment procedures are therefore necessary for the tutors. Class projects particularly are important because they are required by the Ghana Government policy on continuous assessment in the basic schools. For each term, teachers are expected to record four scores for project work for each pupil. It is therefore expedient for pre-service teachers to have knowledge on the construction and use of class projects.

The study found that the level of knowledge in continuous assessment for pre-service teachers was low. It was further found that the level of knowledge was higher for those who had training than those who did not have training. The low level of performance on the knowledge test is evidence of the lack of training in continuous assessment procedures. This situation, which was also found in the United States (Plake, et al., 1993), created a growing concern among assessment professionals and educators. This concern essentially led to the development of the Standards for Teacher Competence in Educational Assessment of Students by the American Federation of Teachers (AFT), the National Council on Measurement in Education (NCME), and the National Education Association (NEA) in 1991 in the United States. The standards are as follows:

1. Teachers should be skilled in choosing assessment methods appropriate for instructional decisions.
2. Teachers should be skilled in developing assessment methods appropriate for instructional decisions.
3. Teachers should be skilled in administering, scoring, and interpreting the results of both externally-produced and teacher-produced assessment methods.
4. Teachers should be skilled in using assessment results when making decisions about individual students, planning teaching, developing curriculum, and school improvement.
5. Teachers should be skilled in developing valid pupil grading procedures which use pupil assessment.
6. Teachers should be skilled in communicating assessment results to students, parents, other lay audiences, and other educators.



7. Teachers should be skilled in recognizing unethical, illegal, and otherwise inappropriate assessment methods and uses of assessment information. (American Federation of Teachers, National Council on Measurement in Education and National Education Association, 1991, pp. 30-32)

These standards have addressed the basic knowledge and skills that teachers need to function effectively in the classroom. Teacher training institutions are expected to provide the basic foundation in the acquisition of these skills. It is important that Ghanaian teachers acquire a high level of competence in each of the standards. This competence can be achieved if priority is given to the teaching of continuous assessment techniques and procedures at the teacher training colleges.

This issue is very important considering the role of assessment in teaching and learning. Classroom teachers need assessment information to make far-reaching decisions. These decisions include, (a) providing knowledge about the readiness of individuals (pupils, students) to learn a new set of curricular content, (b) setting realistic instructional goals and objectives for the class as well as individual pupils (c) discovering the learning difficulties of the pupils and providing remedial action, (d) selecting the best instructional technique to adopt for the class and for each course, (e) evaluating the degree to which objectives in the classroom are being achieved, (f) determining the progress made by each individual student in learning, (g) serving as a source of motivation and directing and facilitating students' learning, (h) providing feedback or knowledge of results to the students to enable them identify their own strengths and weaknesses as well as progress, and (i) assigning grades to students, which provide a record of achievement.

These decisions have far-reaching consequences, not only on the teacher but the students as well as the manpower needs of the country. The failure of the teacher education unit to provide guidance in providing pre-service teachers with skills in assessment techniques is inexcusable. Assessment courses must be given proper attention in the curricula of the teacher training institutions.

Evidence from the responses showed that the content of the training differed from college to college. Principals of the teacher-training colleges need to get copies of the continuous assessment manual from the Ministry of Education for their tutors to use it for teaching. In the training, emphasis needs to be placed on the use of personal observations and class projects since these techniques seem to be neglected.

In addition, it is suggested that in the final teacher-training college external examinations, a complete section be set aside in one of the Education papers for the assessment of the students' knowledge in assessment techniques and procedures. Presently, knowledge in continuous assessment does not feature in the teacher education certifying examination. In the Ghanaian educational system, students do not treat non-external examinable subjects with seriousness of purpose. Since continuous assessment procedures deserve important attention, making it a subject for external examination will make the students study it seriously.

#### Conclusion

It is evident from the study that, on the whole, pre-service teachers have little or no training in assessment procedures by the end of their second year of the three-year IN-IN-OUT programme. It is also evident from the reports of the trainees that the teachers are competent to teach courses in assessment techniques. What is lacking is the mandate from the teacher education division of the Ministry of Education to enable curriculum planners incorporate assessment techniques as a course in the first and second year curriculum.

I do agree with Plake, et al. (1993) that, "perhaps part of the lack of more universal training in assessing student performance is the general absence of any mandate for such training. Teacher education programmes must take the initiative to provide the students with skills and knowledge in assessing student performance" (p. 117). The teacher education division in Ghana must mandate the teacher education curriculum planners to make courses in assessment a priority in the first-two years. This is currently lacking. The curriculum planners must ensure that the assessment courses have a practical focus in order to reveal to pre-service teachers the need for assessment competencies and to increase the commitment to attaining these competencies.

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