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RELATIONSHIP BETWEEN TEACHERS' MASTERY OF PRACTICAL GEOGRAPHY SKILLS AND STUDENTS' ACQUISITION OF THESE SKILLS: THE CASE STUDY OF "A" LEVEL SCHOOLS IN CENTRAL UGANDA

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Abstract:
The study aimed at assessing how teachers' mastery of practical Geography skills influenced A-level students' acquisition of these skills. The sample comprised 744 respondents including 60 teachers and 672 students. Data was analyzed using one–way ANOVA and the t-Test using SSPS data analysis package (16.0 version). Qualitative data was analyzed using descriptions in themes deciphered in the course of the study. Majority of the teachers and students lacked requisite skills to in practical geography. There was a significant relationship between teachers' mastery of skills and students' acquisition of these skills. Both teachers and students found difficulties in interpreting photographs and map, and in using field and statistical data. It was concluded that many teachers and students lack sufficient skills in A-level practical geography. There is need to strengthen preservice and in-service teacher training focusing on teaching strategies, mastery of the skills in practical Geography and field work activities.

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1. Introduction

According to Wise (2000), the teacher requires among other things the skills in the subject matter including the practical aspects of the subject and being able to establish the interrelationships between different subjects. Such skills are essential for the professional preparation of a teacher and anchors firmly on a foundation of general education of a teacher, which contributes to the growth of a teacher as a professional. The National Geographic Society (1997-2017) contends that to answer geographic questions, students should start by gathering data from diverse sources in various ways to develop information that will inform their responses. The required skills include those needed in locating and collecting data, observing and systematically recording information, reading and interpreting maps and other graphic representations of spaces and places, interviewing people who can provide both information and perspectives about places and issues, and using statistical methods. Students should be able to read and interpret different kinds of maps, compile and use primary and secondary information to prepare quantitative and qualitative descriptions, and be able to collect data from interviews, fieldwork, and reference material resources.

Cropley and Dave (1978) have also observed that apart from subject specific skills, one necessary skill for teachers within the context of lifelong education is the capacity to make use of broad range of learning resources in order to foster themselves and their pupils, the ability to learn without the supervision of the teachers or the structure of the formal schooling. Margaret (2013) and Zoe (1958) pointed out that students should be challenged often to use the most appropriate skills in a particular situation like interpretation skills when using maps, and skills to draw sketches and cross-sections, presentation of visual data i.e. taking photographs or drawing pictures, draw landscape sketches, presentation of statistical data i.e. constructing graphs, tables, performing calculations based on data and being able to gather information from the field using a variety of techniques such as surveying, field sketching, measuring, photographing, interviewing and observing to explain geographic information. Hammond (2006) stressed that a competent teacher is required to arrange and manipulate the learning environment, which requires a number of tactics intended for learning to take place. These competences can be acquired during training. Training helps teachers to comprehend a number of activities, and to acquire knowledge and skills, which they can use professionally as teachers.

UNEB (2009-2015) reported that the poor students performance in A-level practical Geography was due to lack of skills in practical geography which were manifested as weaknesses noticed in the candidates' scripts, which include amongst others: poor knowledge of map reading and interpretation of relief, annotated maps, and failure to adequately state the objectives of their fieldwork and establish relationships between geographical phenomena. The same report adds that teaching, learning and assessment of the students in schools should shift towards testing higher order cognitive skills, processes and competencies, as well as the affective and psychomotor attributes. It further recommends diversifying assessment to include practical or performance orientated testing instruments so as to improve the performance of students. The UNEB reports (of 2004-2010) indicate that some candidates fail to draw sketch maps, with clear vertical scales of the cross sectional drawings. They also fail to bring out the relationship between drainage and communication networks and that most students do not attempt the question on photographic interpretation due to their inability to interpret geographical features, which provides the evidence that the teaching and assessment of practical skills in Geography are not well done in 'A' level secondary schools in Uganda. Male (2007), reported that the lack of appropriate skills among the 'A' level candidates results in their poor performance in the construction of statistical maps and diagrams. He stressed that most of the 'A' level Geography students who attempt statistical numbers in Geography do not pass to the expectations. This weakness is attributed to lack of skills of some teachers in both the subject and also pedagogy to effectively teach practical geography. This research therefore investigated teachers' mastery of practical geography skills and its influence on students' acquisition of these skills.

The sub-objective therefore was: "*Does teachers' mastery of A-level Practical Geography influence students' acquisition of these same skills in the subject? In other words, is there a relationship between teachers' mastery of skills and their acquisition of skills in practical geography?"*

2. Methodology

2.1 Design

This study used a cross section survey design that employed both qualitative and quantitative approaches. As suggested by Amin *et al* (2005), these approaches were preferred because they combine the benefits confronting the diversity of "multiple realities'' one finds in more complex field situations while also take into consideration representative sampling.

2.2 The population size

The main target respondents were 'A' level teachers and students. The secondary schools that were considered were 24, i.e. (12) government secondary schools and (12) private secondary schools from 6 central districts of Uganda. The target population for the students was 672 and that for the teachers' was 96. Both the schools and central districts were randomly selected and a representative sample obtained using Krejcie and Morgan (1970) tables.

2.3 Sampling

Purposive sampling was used to select a sample of 4 secondary schools per a district that is, 2 private and 2 government schools because they are very many schools i.e. 1005 secondary schools. Convenient sampling was used to select urban districts and rural districts within the central districts whereby 4 secondary schools were selected. This sample was considered appropriate according to Gay (1996, 126).

A simple random sampling procedure was used to select a sample of 28 students in each of the 6 secondary schools, from the rural and urban districts of central Uganda. Purposive sampling was used to select both geography teachers and heads of department from each secondary school to provide reliable and valid information.

2.4 Procedure

Data collection and analysis was ongoing, involving synthesis of all ideas got both from the primary and secondary sources. A total of 768 questionnaires for the teachers and students were returned, a response rate of 92%. The method was selected because it is time saving, records can be kept for future use, and interviewing purposively and randomly selected respondents.

3. Results and Discussion

Data on teachers' acquisition of skills from the mastery of practical areas of Geography in secondary schools at 'A' level was based on the following in practical areas in order to determine the competencies.

3.1 Teachers' acquisitions of skills in practical areas of Geography

Data on the teachers' acquisition of skills in practical areas of geography was understood to mean the learned ability that one possess through training and exercise, which cannot be obtained by just theoretical knowledge. It also includes the ability to

effectively handle the various instructional materials like map extracts, photographs, and charts among others in teaching, learning and assessment process.

On mastery of skills, teachers were asked in the questionnaire to tick appropriately the practical areas they have mastered in the subject and were therefore confident to deliver to the students and their responses are summarized in tables below.

3.2 Teachers' mastery of practical areas of Geography

The study investigated teachers' acquisition of skills from the practical areas of 'A' level geography. In this study, teachers' acquisition of skills in areas of practical geography was understood to mean the ability that a teacher acquires through training and practice. It is more than just theoretical knowledge, but includes the ability to handle the various instructional materials like map extracts, photographs, charts among others in teaching, learning and assessment process.

On the mastery of content, teachers were asked in the questionnaire to tick appropriately the skills they have mastered and can confidently deliver to students during practical geography lessons and practical work and their responses are summarized in tables 1-6.

Table 1: Teachers' opinions of the areas in which they have mastered skills in map reading and interpretation

Skills	Teachers' perception	Frequency	Percent
Drawing sketch maps	Mastered	63	87.5%
	Not mastered	9	12.5%
Drawing a cross section	Mastered	45	62.5%
	Not mastered	27	37.5%
Calculating scales	Mastered	54	75.0%
	Not mastered	18	25.0%
Calculating areas	Mastered	51	70.8%
	Not mastered	21	29.2%
Calculating the bearing	Mastered	54	75.0%
	Not mastered	18	25.0%
Map interpretation skills	Mastered	51	70.8%
	Not mastered	21	29.2%
Developing relationship skills	Mastered	39	54.2%
	Not mastered	33	45.8%

Source: Field study

Results from table 1 revealed that 87.5% of the teachers reported that they have mastered skills in drawing 75.0% in calculating scales, 70.8% in calculating area, 75.0%

in calculating the bearing, 70.8% in map interpretation skills, 62.5% in drawing a cross section, and 54.2% in relationship skills. The results indicate that almost all the teachers have mastered some skills in map reading and interpretation. However, there is a contradiction between findings reported here and those obtained through interviews whereby some teachers reported that they have not yet mastered skills required in drawing sketch maps. It was revealed during interviews that schools lacked enough map extracts, which could facilitate acquisition of these skills by both students and teachers.

The results in table 1 were subjected to a t-test and it is evident that although no significant statistical difference existed (P>05), on average teachers' in government schools had mastered more skills in Geography P250/1 compared to those in private secondary schools. Nonetheless, a look at the P-value for the t-test revealed no statistical significance in the means suggesting that both teachers in government and private secondary schools perceived the acquisition of different skills in the same way.

On relating the acquisition of various skills in Geography P250/1 to gender, the study also established that more male Geography teachers had mastered most of the skills in Geography P250/1 compared to the female teachers. When the data was subjected to a t-test it was found that there was no significant different (P>05) between the two groups implying that the mastery of skills in practical Geography by both male and female teachers was the same. However, the t-test established that female teachers had acquired more skills in calculating the bearings during map reading than the male teachers (P<05).

Table 2: Teachers' responses on their mastery of photographic interpretation skills

Area	Teachers' perception	Frequency	Percent
Photo-reading	Mastered	14	58.3%
	Not mastered	10	41.7%
Photo-analysis	Mastered	6	25.0%
	Not mastered	18	75.0%
Drawing photo-landscape	Mastered	11	45.8%
	Not mastered	13	54.2%
Photo-deduction	Mastered	8	33.3%
	Not mastered	16	66.7%

Source: Field study

Results from table 2 revealed that majority of the teachers have acquired photo-reading skills with the highest percentage of 58.3% compared to other areas. From the findings, some of the teachers of Geography P250/1 reported that schools have not done much to

organize for them workshops for acquiring photographic interpretation skills. They further reported that they only rely on the past paper photographs.

The study findings were supplemented by the oral interviews. From the interview responses, it was reported that photographic interpretation practice books are lacking in many school libraries. It was also revealed that they need some senior teachers to mentor and support them on how to deal with questions related to the photography interpretation aspects. It was also revealed that majority of the teachers interviewed rely so much on the few available UNEB past papers and photographs, for teaching and assessment. This meant that students were not sufficiently exposed to the required number of photographs during practical lessons. The results were subjected to a t-test by gender, in table 3 as seen in below:

Table 3: T-test results of P250/2 teacher's responses in relation to skills they have mastered in different areas by gender

Photo reading skills	Sex	N	Mean	t-test	p-value
Using photo sketches	Male	51	1.7647	.488	.630
	Female	21	1.8571		
Using landscape sketches	Male	51	1.5882	1.342	.193
	Female	21	1.2857		
Using annotated sketches	Male	51	1.2353	.924	.366
	Female	21	1.4286		
Using analysis of photographs	Male	51	1.4706	.180	.859
	Female	21	1.4286		
Interpretation of photographs	Male	51	1.1765	.578	.569
	Female	21	1.2857		

From the analysis, it is evident that although no significant differences existed (P>05) among male and female teachers' on mastery of the various skills, but on average, more male Geography teachers of P250/2 mastered the skills compared to the female teachers. This meant that both male and female Geography teachers had the same level of mastery of practical Geography skills.

The results from the table 4 indicate that more of the teachers have acquired the skills of analyzing data (66.7%) and interpreting data (62.5%) while only 41.7% have obtained the skill of drawing diagrams and charts. Furthermore, 29.2% were able to explain trends. However, 54.9% of the students reported that they could not draw and interpret charts while 52.1% of them reported that they find difficulties in presenting data on paper. This implies that there is a mismatch between teachers' mastery of skills and that of students in these practical areas. From the interviews, it was revealed that many schools lack the required text books which are needed to help the teachers

acquire the skills of statistics. It was also revealed that teachers need training in some aspects of statistics. Although more teachers' in government schools had mastered most of the various aspects of skills in Paper 2 (P250/2) compared to those in private schools, the differences were not significant (P>05).

Table 4: Teachers' mastery of statistical skills in A-level Practical Geography (P250/2)

Acquisition of skills in Various aspects	**Teachers' mastery**	**Frequency**	**Percent**
Analyzing data	Mastered	48	66.7%
	Not mastered	24	33.3%
Drawing diagrams and charts	Mastered	30	41.7%
	Not mastered	42	58.3%
Interpreting data	Mastered	45	62.5%
	Not mastered	27	37.5%
Explaining trends	Mastered	21	29.2%
	Not mastered	51	70.8%

Source: Primary Data

Data in the table still revealed that, in relation to mastery of the practical Geography in P250/2, the responses of teachers on acquisition of practical skills in this paper varied by gender. More female Geography teachers had acquired more skills in a variety of statistical concepts. However, there was no significant difference (P>05) between the two groups, meaning that both female and male teacher' have the same level of mastery of skills in practical Geography.

Table 5: Teachers' views on their mastery of fieldwork techniques and skills

Aspects	**Teachers' perception**	**Frequency**	**Percent**
Observation	Mastered	61	84.7%
	Not mastered	11	15.3%
Interviewing	Mastered	60	83.3%
	Not mastered	12	16.7%
Recording	Mastered	60	83.3%
	Not mastered	12	16.7%
Measurement	Mastered	27	37.5%
	Not mastered	45	62.5%
Map orientation	Mastered	27	37.5%
	Not mastered	45	62.5%
Questionnaire	Mastered	36	50.0%
	Not mastered	36	50.0%
Sampling	Mastered	51	70.8%
	Not mastered	21	29.2%

Literature review	Mastered	36	50.0%
	Not mastered	36	50.0%
Sketching	Mastered	51	70.8%
	Not mastered	21	29.2%

Source: Field study

Data in the table 5 revealed that majority of the teachers 85.5% have mastered the observation skills, 83.3% interviewing skills, 83.3% recording skills, 70.8% sampling skills 70.8%, 50.0% sketching skills and 50.0% literature review skills. However map orientation (37.5%) and measurement (37.5%) are still problematic.

The revelations were supplemented by the results from the interviews. Over 69% of the teachers reported that some aspects like map-orientation, use of questionnaires and measurement are taught without using the required tools during fieldwork. The students corroborated these findings but reported that the teachers normally give them notes instead of them finding the information for themselves and having the chance to use various methods. They also added that sometimes the maps i.e. panorama, transect and sketch maps are drawn for them and they just copy them.

Although more male teachers had mastered skills in Geography P250/3 compared to female teachers, there was no significant difference (P>05) between the two groups. However, the calculated P -value for the t-test was less than α = .05 on some aspects such as skills of interviewing and literature review whereby more male teachers had better mastery in these areas.

Table 6: Teachers' rating of students' mastery of skills in various aspects of practical geography

Aspects	**Teacher's self-rating**	**Frequency**	**Percent**	**Performance**			
				A-B	**C-D**	**E**	**O**
Map reading skills	Very good	5	6.9%	8.1%	6.9%	13.0%	72.0%
	Good	28	38.9%				
	Fair	31	43.1%				
	Weak	8	11.1%				
Fieldwork skills	Very good	2	2.8%	6.2%	4%	11.2%	78.6%
	Good	23	31.9%				
	Fair	40	55.6%				
	Weak	7	9.7%				
Photographic interpretation skills	Very good	2	2.8%	3.4%	2%	8.7%	85.9%
	Good	22	30.6%				
	Fair	35	48.6%				
	Weak	13	18.1%				
Statistical analysis skills	Very good	7	9.7%	5.1%	2.9%	3.0	89.0%
	Good	16	22.2%				

	Fair	34	47.2%				
	Weak	15	20.8%				

Source: Classroom observations

On fieldwork skills, majority of the teachers rated their students' mastery of the required skills as fair (55.6%). In photographic interpretation skills, majority of the teachers rated their students as fair (30.6%), while only a few rated them as good (18.1%). In statistical analysis skills, majority of the teachers rated their students as fair (47.2%). When the data was compared to the grades of students for that term, it confirmed the views of teachers. The results indicated that the students' performance is poor probably because students lack adequate skills in practical geography.

During oral interviews, teachers revealed that there is a problem of inadequate training of teachers in most of the aspects of practical geography. Very little time is spent on practical geography compared to theory. They also revealed that schools are resource constrained. When the data was tested for the correlation between teachers and students mastery of practical skills, the two were found to be positively correlated (Table 7).

Table 7: The relationship between teachers mastery and students acquisition of skills

		Teachers mastery	**Students acquisition**
Teachers mastery	Pearson correlation	1	0.533
	Sig. (2-tailed)		0.616
	N	72	672
Students acquisition	Pearson correlation	0.533	1
	Sig. (2-tailed)	0.616	
	N	72	672

There is a strong positive correlation between Teachers mastery of practical geography skills and Students acquisition of these skills (r value of 0.533). The sig. 2 tailed value (p) is greater than 0.05 (p value 0.616 > 0.05) hence there is a statistical significant correlation between the two i.e. teachers' mastery impacts on students acquisition of these skills.

4. Conclusion

From the study findings, it was concluded that majority of the teachers still have low mastery of skills needed in the reading and interpretation of maps, photographs, and use of various fieldwork and statistical methods. Teachers' mastery of practical skills in A-level Geography has a significant positive influence on students' mastery of these skills.

5. Recommendations

Following the discussions of the results and conclusions reached, the researchers wish to make the following recommendations.

There is need for the school heads to help the Ministry of Education and Sports to effectively monitor, supervise and encourage their teachers to practically and continuously make use of the various teaching aids like maps and photographs. There is need for the 'A' level Geography teachers to see to it that the students have sufficient practice in reading maps, photographic interpretation and in using statistical data and fieldwork methods. More practical activities or field work should be done by both the 'A' level students and teachers. There is also need for the schools and the Ministry of Education and Sports to support continuous professional development of 'A' level Geography teachers. There is need for a review of the current Geography curriculum followed at universities to make it more relevant for teacher trainees, and to emphasize practical aspects.

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