

A stack of eight books is arranged on a wooden surface against a teal background. The books are stacked in a slightly offset manner, with the titles embossed on the spines. From bottom to top, the titles are: BRAINSTORM, ANALYSIS, PLANNING, STRATEGY, PARTNERSHIP, INNOVATION, LEADERSHIP, and MOTIVATION.

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Full Length Research Paper

Definition of professionalism by different groups of health care students

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Professionalism is important in all service-providing professions. Professional bodies have extensive rules and regulations creating the foundations of the definition of professionalism, its meaning and these rules have to be followed. In view of this, healthcare students are given intensive training. A prospective study conducted in a District General Hospital, to establish if professionalism was clearly defined. A questionnaire with open questions was given to 75 students from different disciplines including medical, nursing and chiropractic students (25 individuals from each group). The participants were at the end of their studies. The General Medical Council (GMC) criteria for professionalism were used. They were discussed as part of their induction to the orthopaedic department and the questionnaire was given to them at the end of their placement. Their answers were grouped, categorised and the findings were then analysed. All groups demonstrated a good understanding of the definition and factors that influence professionalism. Student nurses performed overall better than the other two groups. Medical and chiropractic students scored lower on communication, working with colleagues and audit/research. All three groups scored low in the categories of problem dealing and health. Reflection and mentoring were two of the subjects that they considered as important to help them improve their cognition to become a professional subject. The inclusion of the professionalism as subject to education seems that helps the understanding of the term but contact with the clinical environment and proper mentoring by senior clinicians enhances to the understanding in some of the criteria. GMC criteria can be used for the assessment of cognition of professionalism but with the addition of reflection in the list.

Key words: Professionalism, healthcare, education.

INTRODUCTION

Many educators and professional bodies have been studying the behaviour and attitude of their students or their members extensively in the past towards their customers and their other colleagues. All professional

associations constantly regulate all properties which constitute professionalism. The most professions regulated are those which have as direct objective the human needs and they are those with the subject of

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Medicine, Law, Ministry and Education (De Rosa, 2006). In healthcare, professionalism is gaining an increasing attention (Swick, 2000; De Rosa, 2006; Talbott and Mallott, 2006). Doctors' regulatory body, in their guidance, emphasises that all individuals need to be very attentive towards their behaviour to their patients and the members of patient's families, as well as other health professionals and colleagues. Professionalism is one of the fundamental criteria of every doctor's appraisal and revalidation (American Board of Internal Medicine (ABIM), 2001; Irvine, 2005; General Medical Council (GMC), 2009; Scottish Government, 2012; Health Care and Professions Council (HCPC), 2014).

Professionalism reflects the professional competence of a physician and not only the individual's behaviour (Swing, 2007). Professional competence is more than a demonstration of individual skills and has to be examined as a whole. A competent clinician is able to think, feel and act, like a proper physician (Gale and Marsden, 1982, Eraut, 2000). Professional competence includes communication, knowledge, technical skills and clinical reasoning. It is more than knowledge including as well the individual's ability of solving problems providing clear and definitive solutions. It can be defined as the ability someone has to manage problems, make decisions having limited information and tolerate uncertainty. A person has to be knowledgeable and in the same time to have the correct attitude, to behave ethically, to be altruistic, believe and apply the profession's codes, to have integrity and honesty, respect others and self, to be self-regulated and maintain a high degree of competence (Schon, 1983; Swick, 2000; Wear et al., 2000). It is measured by reviewing the individuals' cognition, technical skills, scientific, clinical and humanistic judgement as well as use of time, team work, teaching, respect, learning, handling conflicts and willingness to recognise and correct possible errors (Epstein and Hundert, 2002). Professionalism can be described as "*the practice of doing the right thing, not because of how one feels, but regardless of how one feels*" (De Rosa, 2006).

Professionalism in healthcare must be the natural base of a clinician's work. Society expects health professionals to have and demonstrate a professional manner in their conduct with those who serve and to each other. All health workers have to understand in depth the meaning of the word "professionalism", and how the lack of it will lead to negative consequences in their career and professional life. Misbehaviour which clearly affects their responsibilities and safety towards the public and their colleagues, leaves medicine tarnished (Swick, 2000; ABIM, 2001; GMC, 2009). Professionalism is part of the educational curriculum in undergraduate level, in most institutions.

The purpose of this study is to find out how different groups of students from different disciplines, different backgrounds, training, experiences, institutions and regulatory bodies, who were given further information on

the GMC criteria and regulations at their induction course to the department, define professionalism and find if further education and training would be necessary, so individuals to become aware of the profession's and mainly the community's needs.

METHODOLOGY

This is a randomised study performed in a District General Hospital. This institution was involved in education and clinical teaching of different disciplines of students. Three different groups of students (Medical, Nursing and Chiropractic) with similarly selected matched groups were included. All participants were at the end year of their undergraduate training and they took part in the study freely. Each group consisted of 25 students. All had received training previously on professionalism through their institute and at induction to the department; they were introduced to the criteria that GMC is used to define professionalism. No hand-outs of the introductory sessions were given to any of the students. At the end of their placement, they were asked if they are willing to take part in the study. Verbal consent was obtained from all participants who participated after an information sheet was given, explaining the aims, objectives and the rationale, was given and read to them (Table 1). Ethical committee approval was obtained (University of South Wales).

The questionnaire was given to them with five questions (one with limited demographic details and four open questions) to be completed (Table 2). The questionnaire was a product of discussion of a small group of senior clinicians who gave their opinion and agreed on the questions. The questionnaire was tried in a previous study and was verified as valid (Zafiroopoulos, 2016). To analyse, group and quantify the answers, the criteria of the GMC's publication were considered as relevant and used (GMC, 2009).

From the first question, the demographics, grade, position and discipline of every participant was established. Participants were divided into their separate groups for healthcare (Medical, Nursing and Chiropractic) according to their discipline.

All replies were grouped and analysed by using the GMC's twelve criteria points that characterise professionalism. The frequency of the answers presented in each group quantified and the total percentage was calculated.

Further grouping analysis and quantification was performed for the answers of the last question asking for the factors which can assist the improvement of professionalism in healthcare. The frequency was calculated.

RESULTS

All 75 participants replied in the questionnaire. The opinions of all participants, from questions 2 and 3, were grouped and analysed using the GMC criteria (GMC, 2009) as basis, for the definition of professionalism (Table 3).

It was found that student nurses had a better overall understanding of professionalism scoring more points than the other two student groups. The points where medical and chiropractic students scored lower were those of communication (80% compliance both groups), working with colleagues/teamwork (Medical Students 92% and Chiropractors 80%) and audit/research (Medical Students 88% and Chiropractors 80%). All three groups scored low in problem dealing (Medical Students 92%,

Table 1. Given and read information.

Information for the project

Thank you for taking the time to participate in this study.

The purpose of the study is to establish the degree of your understanding on the definition of “Professionalism” and how this affects the health care practitioner.

Do all health professionals, despite their training and their regulatory bodies; have the same or a similar opinion about the meaning of Professionalism?

Furthermore, the aim of the study is to establish if there is a need of further education for health professionals or the community which they are serving.

Your complete honesty is valued. The whole data is and will remain anonymously collected and will remain confidential. It will only be used for the purpose of the study.

By agreeing to this information you give your consent to receive a questionnaire and take part in the study.

You understand that you can withdraw from the research at any time without giving a reason.

Table 2. Questionnaire.

Professionalism

Please answer the following questions:

1. Are you a? (Please circle accordingly):
Medical student Nursing student Chiropractor student
2. What is professionalism?
3. What behaviours must healthcare professionals have?
4. How can we improve professionalism in healthcare?

If you wish to offer additional information, please do so below:

Student Nurses 96% and Chiropractors 96%) and health (Medical Students 80%, Student Nurses 96% and Chiropractors 92%).

Following this, the answers of question 4 were grouped and analysed (Tables 4 and 5). Table 4 provides an analytical view of what the participants thought that is important to do to emphasis and keep for the continuity of improvement. It is evident that student nurses have the highest score in all the categories. The medical students gave the lower amount of answers scoring of all groups. In Table 5, the sum of all groups' opinions given is tabulated indicating the different criteria which they think are necessary to improve the understanding of professionalism within all healthcare professionals. It is evident that the criteria of patient relationship/good standards in practice/teaching scored high (100% to 98.6%) but dealing with problems seems that slipped out of their mind (achieving just 35%), and teamwork or

communication were not better off (having 77.3 and 82.6% each). Audit and evaluation of practice scored 86.6 and 84%, respectively. Other criteria as health scored nothing as nobody mentioned it.

Finally, at the last open question of the questionnaire, asking for any additional information, student nurses mentioned that reflection could be one of the criteria to characterise professionalism. From the 25 students of this group, 12 individuals (48%) mentioned reflection as a way to improve understanding of professionalism. From the other two groups, 6 medical (24%) and 5 chiropractor (20%) students said that mentoring will improve their understanding on professionalism.

DISCUSSION

A profession in general is more than a job. For the

Table 3. Grouped answers from Questions 2 and 3 (GMC criteria); All participants (n 75).

GMC criteria	Medical students	%	Student Nurses	%	Chiropractor students	%	Total	%
	(n 25)		(n 25)		(25)			
Relationship with patients	25	100	25	100	25	100	75	100
Providing good standard of practice	25	100	25	100	25	100	75	100
Maintaining good medical practice	25	100	25	100	25	100	75	100
Maintaining the standard of performance/evaluate practice	23	92	25	100	24	96	72	96
Teaching/Training/Assessment	25	100	25	100	24	96	74	98.6
Confidentiality	25	100	25	100	25	100	75	100
Trust	23	92	25	100	23	92	71	94.6
Communication	20	80	25	100	20	80	65	86.6
Dealing with problems	23	92	24	96	24	96	71	94.6
Working with colleagues (Teamwork/Leadership/Respect/Sharing information)	23	92	25	100	20	80	68	90.6
Audit/Research/Reporting/Honesty/Ethics	22	88	25	100	20	80	67	89.3
Health	20	80	24	96	23	92	67	89.3
Total number of the points mentioned in the answers	279	-	298	-	278	-	855	-

Table 4. Grouped answers extracted from questions 4 (GMC criteria); All participants (n 75).

GMC criteria	Medical students	%	Student Nurses	%	Chiropractor students	%
	(n 25)		(n 25)		(25)	
Relationship with patients	25	100	25	100	25	100
Providing good standard of practice	25	100	25	100	25	100
Teaching/Training/Assessment	25	100	25	100	24	96
Audit /Research/Reporting/Honesty/Ethics	20	80	25	100	20	80
Maintaining the standard of performance/evaluate practice	18	72	25	100	20	80
Communication	18	72	25	100	19	76
Working with colleagues (Teamwork/Leadership/Respect/Sharing information)	18	72	25	100	15	60
Dealing with problems	3	12	24	96	7	28
Total answers	152	-	175	-	156	-

Table 5. Sum of the ways need to improve professionalism (Grouped answers of all students).

Factors to improve professionalism (n 75)	Answers	Percentage
Relationship with patients	75	100
Providing good standard of practice	75	100
Teaching/Training/Assessment	74	98.6
Audit /Research/Reporting/Honesty/Ethics	65	86.6
Maintaining performance/evaluate practice	63	84
Communication	62	82.6
Teamwork/Leadership/Respect/Sharing information	58	77.3
Dealing with problems	35	46.6

service-providing professions is the activity and commitment of someone to serve others without forgetting the need to serve one's self. A professional has

to be dedicated to the chosen profession. All health professionals are bound by their oath to serve their patients ethically. A doctor for example, takes the

Hippocratic Oath. Health workers bind to the commitment to use their abilities, knowledge and skills for the service and treatment of all confronted illnesses a patient has. To do this, they have to demonstrate moral and ethical excellence. They have to inspire trust, honesty and compassion to others and must have the courage to confront all difficulties that may arise. To learn all this, they have to have cognition or pre-cognition of these properties. They must also train themselves during their professional journey. They have to be disciplined and belief in self-improvement. It is very common to have a mentor and try to follow this mentor's steps and learn the ethics of the profession. Continuous learning is paramount for anybody's continuous progress and improvement (De Rosa, 2006). In those cases that human and cognitive weakness may surface, the mentor's support and advice has to be taken. Mentor's knowledge is useful, as some of the ways that are necessary for further development is hidden and it has to be identified, bringing it up on the surface and in real life (Hafferty and Franks, 1994).

Professionalism is under increased scrutiny across all professions. These professions that have as their subject the direct service towards other persons, like health, law, ministry or teaching are those that are more affected (De Rosa, 2006; HCPC, 2014). Professionalism, though, is not clearly and well defined. A lot of scholars and organisations place their criteria and regulations of what the word means and what characteristics a professional should have. Some of these criteria are common among the published work, but other criteria are not well defined (ABIM, 2001; Swing, 2007; HCPC, 2014; GMC, 2009, 2015). The definition which is coded by all these different organisations though is not the real problem. The problem arises on the way each single individual understands, interprets or even practices this given information the institutions provide. There are factors that may threaten professionalism. Stress, lack of confidence, fatigue, overwork, lack of experience, conflicts or tensions between professionals or arrogant superiors are some of them. Due to this, a healthcare worker has to be supported with more training, obedience to policies, reflection and mentoring (Gale and Marsden, 1988; ABIM, 2001; Epstein and Hundert, 2002).

There is a consensus among scholars and organisations that training for the definition of professionalism has to start early in a health worker's life. A lot of educational institutions have undergraduate curricula in which professionalism is taught. The definition codes are well explained; as they are well controlled and assessed within the educational programmes and courses. It is found though that it is necessary that a person has to have a constant stimulation of their personal cognitive knowledge. This will help this person's thinking and performance according to the rules. The educators have to be aware of their students' different backgrounds and "adjust" their behaviour (Hafferty and

Franks, 1994; Eraut, 2000). Professionalism is a combination of values, behaviour and relationships (Engel et al., 2009). The professional competence is part of professionalism (Eraut, 2000; Swick, 2000; Redfern et al., 2002; Scottish Government, 2012). As professionalism is considered an important part of a health worker's contract with society, every individual has to continue improving by constant personal development training and continuing exposure of themselves to different experiences (Kirk, 2007). There are voices calling that the selection of health workers or health workers to be, has to start even on the admission process to the institutions (Passi et al., 2010; Waheet et al., 2011; Scottish Government, 2012). Professionalism of the individuals who are involved in health care is necessary to be assessed by using a multitude of methods (Salvatori, 1996; Redfern et al., 2002).

The fear of all educational institutions is the unprofessional behaviour of students, which if present, may lead to negative behaviour at their future professional life. This behaviour may lead to the erosion of the professionalism health care workers have to provide. People from different backgrounds may influence this. Students on the other hand are welcoming the diversity of different backgrounds of either their learners or educators. What they demand though is the need to follow ethical professional rules at all time. They have blamed the unprofessional behaviour of their educators and the influence of such actions made upon them. These educators were meant to be their mentors. Such appealing behaviour from the seniors can have a devastating effect on the juniors and can lead to confusion and bad habits (Swick et al., 1999; Roberts et al., 2004; Brainard and Brislen, 2007). It has been suggested that students with unprofessional behaviour need to undergo mental health evaluation (Bennett et al., 2001). Students may demonstrate unprofessional behaviour if their teaching is insufficient and becomes impossible to them to fully understand the subject. Due to the growing interest and emphasis on professionalism, there is the suggestion that psychiatrists need to be involved directly in the education of these matters, such as definition of professionalism (Talbot and Mallott, 2006). On the counts to tackle unprofessional behaviour, the implementation of measures such as reflection, self-assessment and role model are thought to be more helpful in encouraging professional development, but it would be necessary to "ring-fence" the time allocated to the learners and release the pressure from the educators (Swick, 2000; Reed et al., 2008; Engel et al., 2009).

In the present study, students of three groups representing different disciplines of health professionals, with different training and institutions, trying to throw light on the understanding that they have on professionalism. All of them were at the end of their training. This made them direct future professionals and they were considered able to recognise the properties constituting

professionalism (De Rosa, 2006). The GMC criteria of characteristics defining professionalism were used (GMC, 2009). These criteria were chosen as more descriptive and concise than those used of the other professional bodies and their theme is not different from professional criteria or properties mentioned by other authors (De Rosa, 2006; Kirk, 2007). In a previous contacted study, it emerged that the criteria mentioned by GMC were one of the limitations, as they were not taught in detail to the different professionals and possibly were not understood or followed with the same degree by them (Zafiroopoulos, 2016). Because of this reason, a detailed discussion is given on those who took place during the students' induction in the department. All criteria were presented in detail to all, educating them on the matter.

From the findings, it emerged that student nurses scored higher than the other two groups, despite that they were introduced to these criteria for the first time during their initial day in the department. The group of the Chiropractor Students, despite that they also were introduced to the criteria during their induction day for the first time, came almost level with the group of the medical students who had participated in instruction tutorials on the GMC regulations and criteria of professionalism through their institution.

This is an indication of the "open mind" that these two groups shown during their induction and their willingness to fully understand the "rules" of another professional body, although it is known that they apply similar criteria themselves (Salvatori, 1996; Redfern et al., 2002; Scottish Government, 2012). It is noticeable that their effort to adapt their behaviour accordingly (Engel et al., 2009).

Student nurses mentioned, more than any of the others, that working in teams and clear communication improves the quality of the service they provide to their patients. Chiropractor students score the same as medical students on communication, but lower than the others two groups on teamwork. This is possibly due to the way they practice at a later stage during their professional lives. It is common for Chiropractors to work as sole practitioners on the private sector. Despite this 20 subjects of the chiropractic students (80%), define themselves as part of a team indicating that education and mentoring can stimulate and alter their cognitive understanding and place them as part of the wide health care group.

In Audit and Research Student Nurses again scored higher. This may be linked with their practice of reflection which they perform during their training. This probably drove them to mention this as addition to the criteria. During their reflection they are used to discuss cases in detail, promoting research and auditing, something that possibly is not an extensive practice at the other two disciplines.

The practice of reflection may be the reason that student nurses answered higher, in comparison with the

other two groups, mentioning that dealing with problems will improve professionalism in healthcare. Reflection is a key element for the improvement of professional behaviour (Gale and Marsden, 1988; Epstein and Hundert, 2002; Engel et al., 2009).

It is interesting to note that health scored low in all three groups as one of the criteria influencing professionalism. Nurses scored slightly higher than the other two groups, although the numbers do not show so much of a difference. Despite this, nobody from any of the groups included health as one of the criteria which can improve professional behaviour. This could be due to the reason that younger people in general are known not to consider health decay as important. They perceive themselves as being strong and will live a lengthy healthy life. This indicates the need to understand that health is part of one's personal development (Kirk, 2007).

Differences on the training between these three groups may be the reason of the way that they responded. Student nurses as well as chiropractic students are participating in the clinical environment at an earlier stage than the medical students. Medical students are subjected to early active clinical participation and the delay of mentoring by the senior clinician in a "true" professional environment may be the reason of lower scoring in some criteria by this group in comparison with the former mentioned groups. So emphasis on this part may strengthen the position of the medical students. Well versed tutors can influence this in a positive way (Roberts et al., 2004; Reed et al., 2008). Mentoring is stressed by some individuals of medical student group as well as by the chiropractors as one of the criteria which will strengthen their professional understanding. This is following the lines of other researchers (De Rosa, 2006).

The criteria used were based on GMC regulations and despite the possibility of other people apart from doctors were not fully aware of the different characteristics; it was found that made no difference when all groups were educated on those. They include properties of professionalism analysed and mentioned by other scholars (Gale and Marsden, 1988; Epstein and Hundert, 2007; De Rosa, 2006; Kirk, 2007; Engel et al., 2009). All healthcare institutions and organisations would be of interest to publish common clearly defined across the board. This way all health professionals would "obey" the same criteria.

The study's limitation could possibly be the number of the individuals included in each group. This is the result of the number of individuals who are trained in the department as well as the number of individuals who were happy to participate in the study. It is possible that a bigger sample would give a clearer picture.

Conclusions

It was proven, within the limitations, that students of

different healthcare disciplines have a clear understanding of professionalism, according to the GMC definitions and within the barriers of their practices. Student nurses performed better and possibly this is a result of their pre-cognition as they are practicing active reflection during their training. Inclusion of “reflection” in the curriculum will improve greatly the understanding of professionalism.

Further education emphasizing the significance of “Health” and “Problem Dealing/Solving Training” in the professional development has to be done. Effort to educate sole practitioners on “Teamwork” will be important to patients’ benefit.

A further study has to be performed using greater number of participants of all categories.

CONFLICT OF INTERESTS

The author has not declared any conflict of interests.

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Full Length Research Paper

Analysis of computer self-efficacy of Turkish undergraduate students in the sport management departments

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In this study computer self-efficacy of Turkish undergraduate sport management students was investigated. There were a total of 295 sport management students from three universities. Data were collected by survey which was developed by Compeau and Higgins, 1995, translated to Turkish and adapted for students by Aktağ, 2013. The results showed that there was a significant positive correlation among students' computer self-efficacy, performance outcome, personal outcome, affective outcome and a significant negative correlation between computer self-efficacy and anxiety level. Although there is no difference between males and females in terms of computer self-efficacy in the study, the high level of anxiety of female students indicates that they should be supported in technology. Students who are taking computer course received the highest computer self-efficacy than others who were not.

Key words: Computer self-efficacy, anxiety, sport management students, gender.

INTRODUCTION

The incorporation of technology into the teaching and learning has become an important piece in every part of higher education (Saleh, 2008). Students' acquisition of a high level of technological skills and ability is considered a basic part of the 21st century curriculum, equivalent to importance of reading and writing (UNESCO, 2000 as cited in Giles and Kent, 2016). Computer and technology education has become a necessary part in educational institutions' curriculum (Hsu and Huang, 2006). Turkish Council of Higher Education (TCHE) recommends

universities to offer computer courses to help students become more proficient in fundamental computer skills and have knowledge about basic concepts of technology. Commission on Sport Management Accreditation (COSMA) indicated that sport management programs need to include technology and computer courses in their programs (COSMA, 2016).

According to COSMA (2016), students from sport management departments may have technological advancements such as web streaming, instant replay for

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officials, injury rehabilitation and social media in addition to use of technology in the classroom to strengthen and stimulate learning. The use of technology in the form of various computer programs is prevalent within many of these operating areas inside sport organizations (Diacin and Van Sickle, 2014).

There is a growing need for technology in the undergraduate sport management curriculum (Hjerpe, 2009). Advancements in technology help to “globalization of sport” and hence the sport management classroom must exhibit that to properly train students for entry into this business (Masteralexis et al., 2012 as cited in Hardin and Pate, 2015). Although a computer course is an effective factor in learning how to use a computer, it does not guarantee that the student will be able to use a computer in every stage of daily life (OECD, 2004 as cited in Tezci, 2011).

For a variety of reasons, there are university students who do not have fully integrated computers in their professions or daily life. Self-efficacy might be one of the reasons that influence individuals' computer usage.

Self-efficacy beliefs have been associated with the studies of Albert Bandura (1997) who defined self-efficacy as “beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments”. An individual's high level self-efficacy might lead to the accomplishing tasks that exceed his or her capabilities, while low self-efficacy might result in the underestimation of one's abilities, thus, leading to under achievement (Bandura, 1982).

Computer self-efficacy (CSE) is based on the belief in one's ability to use advanced computer skills (Compeau and Higgins, 1995). If individuals have high self-efficacy, they tend to see themselves as adequate in using computers. On the contrary, individuals who have low self-efficacy become more disappointed and distressed working with computers and hold back themselves to use computers when they face an obstacle (Karsten and Roth, 1998).

Compeau et al. (1999) developed a model related with CSE. According to this model there is a connection between cognitive factors (self-efficacy, performance and personal related outcome expectations), affective factors (affect and anxiety) and computer usage. Self-efficacy exhibits an individual's beliefs in his/her ability to engage in specific and complicated actions to use computer technology and high self-efficacy brings some expectations as an outcome. Performance related expectations such as rise in job or school performance and, personal expectations such as raises, promotions or praises. Effect and anxiety are the emotional responses of individuals for using computers. While effect characterized as positive feelings such as, enjoyment in using computer, anxiety represents negative feelings such as fear or apprehension when using computers.

According to Hsu and Huang (2006), computer use was the most critical element altering CSE, and in order to enhance students' CSE, educators should consider

increasing students' computer use. In past research, CSE has been connected as a crucial factor for computer-related ability and computer practice (Hasan, 2003). Computer experience is integrated in the amount of time an individual has spent working with computers and the different applications they have learned to use. More years of experience and more frequent computer use should give more opportunities to gather CSE information (Karsten and Schmidt, 2008). As individuals gain more experience with computers, their CSE level increases, too (Saleh, 2008; Papastergiou, 2010). In this study, students were asked if they took computer course or not and frequency of computer usage.

Computer anxiety is another reason why individuals use computers ineffectively. The more experience an individual has with computers, the lower the level of anxiety (Compeau et al., 1999; Şimşek, 2011; Korabili et al., 2010).

Gender is another factor that influences the CSE and frequency of computer usage. This issue has been investigated in many studies. Some researchers demonstrated males have more positive attitudes toward computers when compared to females (İşman and Çelikli, 2009; Cassidy and Eachus, 2002) while others reported no difference between males and females (Ünlü and Süel, 2014).

Computer courses serve as a way of ensuring that students work with computers. The relationship of this experience with CSE becomes an important part of practice. Pointed out by Compeau and Higgins (1999) as cited in Stephens (2006) that in educational environments, one of the main advantages of computer self-efficacy is that it can be used to evaluate individuals' access to and the effectiveness of computer education. According to Cassidy and Eachus (2002) in order to employ and effectively exploit computer technology, educators need to address, as a key issue, computer user self-efficacy beliefs in learners. On the basis of all those information, this current study was focused on evaluation of computer self-efficacy in sport management student.

METHODOLOGY

Purpose of the study

Using technology in their profession is an important part of being an innovative sport manager. That is why in order to use technology effectively, in this regard; using computers in their daily and professional life, individuals in sport management area must have high computer self-efficacy. For this reason, performance in computer courses needs to be evaluated. Therefore the purpose of this study is to determine the computer self-efficacy, performance outcome, personal outcome, affective outcome and anxiety level of students from sport management departments. And also, to determine the influence of gender, whether they take computer course, if they do the grades obtained from the course, and how often the computer is used on computer self-efficacy.

Hypothesis of this study were as follows:

1. There is a positive relationship between computer self-efficacy, performance outcome, personal outcome and affective outcome.
2. There is a negative relationship between computer self-efficacy, personal outcome, performance outcome, affective outcome and anxiety.
3. There is a difference in computer self-efficacy, personal outcome, performance outcome, affective outcome and anxiety level of students according to gender.
4. There is a difference in computer self-efficacy, personal outcome, performance outcome, affective outcome and anxiety level of students whether they took computer course before, taking the course now or have not taken the course yet.
5. There is a difference in computer self-efficacy level of students according to grades they received from computer course.

Participants

The subjects of this study were undergraduate students in Sport Management Departments from three universities: Abant İzzet Baysal University (AIBU), Celal Bayar University (CBU) and Sakarya University (SAU). There were 96 female and 199 male with a total of 295 undergraduate students in this study. Participation was voluntary.

Data collection instrument

In this research, originally developed by Compeau and Higgins (1995) adapted for students and translated to Turkish by Aktağ (2013) Computer Self-Efficacy Scale (CSES) was used. Validity and reliability of this scale was conducted by Işıl Aktağ in 2013. As a result of factor analysis CSES consists of 5 factors and 28 items. For reliability of the data, the Cronbach alpha was found as 0.88 for the whole scale Aktağ (2013). In current study, Cronbach alpha coefficient was determined as .88 for whole scale too.

Even though this scale is called computer self-efficacy scale, it contains 6 parts:

- 1: The computer self-efficacy (CSE) was measured by 10 items. Participants were asked to indicate their ability to perform a task on computer on a 10 point scale.
- 2 and 3: Personal outcome (PO) and the performance outcome (PFO) were measured by 9 items in 5 point scale.
- 4: The affective outcome (AFO) was measured by 5 items with a 5 point scale.
- 5: The anxiety (A) was measured by 4 items.
- 6: Computer usage was measured by asking frequency of computer usage at their daily life.

Data collection procedure

For the data collection AIBU, CBU, and SAU sport management departments were selected because computer course was mandatory. CSES was given to all students in those universities during 2014 and 2015 spring semester. After examining the results of the CSES completed by the students, the scale which was filled incorrectly were eliminated and finally 295 forms were evaluated in the study.

Data analysis

The data was analysed by using descriptive statistics and independent samples t-test, one-way ANOVA and Pearson correlation coefficient statistical techniques. In order to view the assumption of the data's normality, Kolmogorow-Smirnov normality

test was performed. As a result of this analysis it can be stated that the data is distributed normally. The statistical significance level was determined as 0.05.

FINDINGS

Research findings related to the computer self-efficacy, anxiety, performance, personal and affective outcomes of the students are shown in Table 1. In the table, the arithmetic mean of participants' CSE, PFO, AFO, PO and A calculations are tabulated with their standard deviations. When Table 2 is explored, a significant positive correlation among the participants' computer self-efficacy and the performance outcome ($r=0.39$, $p=0.000<0.01$) can be seen. The rest are given respectively as the computer self-efficacy and the affective outcome ($r=0.30$, $p=0.000<0.01$), the computer self-efficacy and the personal outcome ($r=0.27$, $p=0.000<0.01$), the affective outcome and the performance outcome ($r=0.42$, $p=0.000<0.01$) and the personal outcome and the performance outcome ($r=0.45$, $p=0.000<0.01$). However, a negative correlation among participants' anxiety and the computer self-efficacy ($r=-0.26$, $p=0.000<0.01$) and the affective outcome and the computer self-efficacy ($r=-0.28$, $p=0.000<0.01$) were found. According to Table 2, it can be said that as CSE increases, PFO, AO and PO increase as well. On the other hand as A increases, CSE and AO scores decrease significantly.

Table 3 presents a comparison of the students' computer self-efficacy, the anxiety, the performance, the affective and the personal outcomes according to gender. It is found except anxiety there was no significant difference between male and female students' in their computer self-efficacy, performance, affective and personal outcomes. The only difference between male and female students is found in anxiety scores. Female students' anxiety mean is 8.23 while it was 7.17 for male students' ($t(295)=2.45$, $p=0.015<0.05$).

When Table 4 is analyzed, significant differences were found in the computer self-efficacy, the anxiety, the performance and the affective outcomes, of students whether they took computer course, taking it currently or did not take it yet. For CSE, PFO and AO, students who are taking computer course currently had the highest scores among others, respectively $\bar{X}=77.12$, $\bar{X}=15.25$, and $\bar{X}=20.7$. For A, students who are taking computer course currently had the lowest anxiety score among others, $\bar{X}=6.20$.

The findings in Table 5 have revealed the significant differences at students' CSE scores according to the grades from the computer course. In this study grade AA represents the score from computer course is above 90, BA is between 85-89, BB is 80-84, CB is 75-79, CC is 65-74, DC is 60-64 and DD is 55-59. According to the findings, there were significant differences between students who had DD with all other grades except DC.

Table 1. Mean and S.D. of sport management students' computer self-efficacy, performance outcome, personal outcome, affective outcome and anxiety.

Parameter	N	\bar{X}	SD
Performance outcome	295	14.94	2.86
Affective outcome	295	18.79	3.61
Anxiety	295	7.51	3.53
Computer self-efficacy	295	71.81	19.29
Personal outcome	295	16.08	4.71

Table 2. Pearson correlation results of computer self-efficacy, performance outcome, personal outcome, affective outcome and anxiety.

Variable		Computer self-efficacy	Performance outcome	Affective outcome	Anxiety
Performance Outcome	r	0.394*			
	p	0.000			
	N	295			
Affective Outcome	r	0.302*	0.427*		
	p	0.000	0.000		
	N	295	295		
Anxiety	r	-0.269*	-0.107	-0.280*	
	p	0.000	0.065	0.000	
	N	295	295	295	
Personal Outcome	r	0.273*	0.455*	0.393*	0.098
	p	0.000	0.000	0.000	0.092
	N	295	295	295	295

p<0.01.

Table 3. T test results of computer self-efficacy, performance outcome, personal outcome, affective outcome and anxiety due to gender.

Measurements	Gender	N	\bar{X}	SD	df	t	p
Computer Self-efficacy	Female	96	73.58	18.14	293	1.09	0.276
	Male	199	70.96	19.81			
Performance Outcome	Female	96	14.83	2.95	293	-0.454	0.650
	Male	199	14.99	2.82			
Affective Outcome	Female	96	18.21	3.95	293	-1.90	0.058
	Male	199	19.07	3.41			
Anxiety	Female	96	8.23	3.57	293	2.45	0.015*
	Male	199	7.17	3.47			
Personal Outcome	Female	96	16.04	4.48	293	-0.117	0.907
	Male	199	16.01	4.83			

p<0.05.

When Table 6 is analyzed, no significant difference was found among students who said they use computers once a week, several times a week and every day. About half of the students use computers every day. This shows us that most students spend a lot of time with computers

in their daily life.

DISCUSSION

In this study, students of the departments of sports

Table 4. One way ANOVA results of computer self-efficacy, performance outcome, personal outcome, affective outcome and anxiety due to taking computer course.

Measurements	Course	N	\bar{X}	SD	F	p	Post Hoc
Computer self-efficacy	Yes	186	72.81	18.45	4.98	0.007*	Yes-No; no-now
	No	69	66.04	22.13			
	Currently	40	77.12	15.59			
Performance outcome	Yes	186	15.16	2.82	3.43	0.03*	Yes-no
	No	69	14.15	2.93			
	Currently	40	15.25	2.72			
Affective outcome	Yes	186	18.69	3.68	3.85	0.02*	Yes-now; no-now
	No	69	18.24	3.41			
	Currently	40	20.17	3.34			
Anxiety	Yes	186	7.53	3.72	4.10	0.01*	No-now
	No	69	8.21	3.23			
	Currently	40	6.22	2.77			
Personal outcome	Yes	186	16.25	4.66	0.893	0.410	
	No	69	15.43	4.71			
	Currently	40	16.45	4.93			

p<0.05.

Table 5. One way ANOVA results of computer self-efficacy due to grades from computer course.

Measurement	Grades	N	\bar{X}	SD	F	p	Post hoc
Computer self-efficacy	AA	51	78.98	20.14	5.91	.00	AA-DD
	BA	20	79.60	13.75			BA-DD
	BB	36	72.83	17.92			BB-DD
	CB	24	68.54	17.03			CB-DD
	CC	41	69.12	18.02			CC-DD
	DC	8	58.75	16.72			
	DD	8	45.50	11.75			
	Total	188	72.10	19.22			

p<0.05.

Table 6. One way ANOVA results of computer self-efficacy due to frequency of computer usage.

Measurement	Computer usage	N	\bar{X}	SD	F	p
Computer Self-efficacy	Once a week	21	68.47	19.73	0.345	0.709
	Several times a week	117	72.23	18.43		
	Everyday	157	71.94	19.93		

p<0.05.

management from three universities were taken as samples. The CSE, anxiety level, performance, affective and personal outcomes investigated in relation to their

gender, grade of the computer course and frequency of computer usage.

Pearson correlation coefficient was calculated in order

to be able to see the relationship of students' CSE, anxiety, performance, personal and affective outcomes. According to the calculations, a low positive correlation among students' CSE, performance outcome, affective outcome and personal outcome scores was found on the other hand it was found a low negative correlation between the anxiety and the CSE and the anxiety and the affective outcome. These results approve the studies of Compeau et al. (1999), the CSE and the outcome expectations are powerful and significant predictor of the affective outcome and the anxiety. Findings of this study are also supported by Şimşek (2011) and Korobili et al. (2010) that the CSE has a negative correlation with the anxiety. Namely as anxiety level decreases so too the level of computer self-efficacy and affective outcome.

The t test results indicated that there was no significant gender related difference in the CSE, the performance outcome, the affective outcome and the personal outcome of the students. The only significant difference between male and female students was found in anxiety scores. Male students had lower anxiety scores ($\bar{X}= 7.17$) than female students ($\bar{X}= 8.23$). Gender differences results were inconsistent. Some of the findings indicated that the male students had higher CSE than the female students. However, much of the literature indicated that there are no differences between genders. Consistently, according to Pamuk and Peker (2009), Teo (2008), Ünlü and Süel (2014) and Zorba (2011) there are no significant differences between males and females in the CSE levels. According to İşman and Çelikli (2009), Şimşek (2011), Papastergiou (2008), and Huffman et al. (2013) on the contrary, male students are more confident as compared to female students in computer usage. Although there was not any significant difference at students' CSE level related to their gender, surprisingly a significant difference was found between the female and male students' anxiety level. Because of their high anxiety level of female students while using computers they could not make any computer related career choices. This might also affect their attitudes towards computer technologies.

Results related to the students' taking computer course and their CSE, the anxiety, the performance, the affective and the personal outcomes showed that the CSE, the performance and the affective outcomes of students who declared they are taking computer course currently had significantly higher than students who declared they have not taken it yet or took it before. Besides, the anxiety scores of students who declared they are taking computer course currently had the lowest among others. In this case, the influence or effectiveness of the computer course for extended period of time needs to be questioned. For students taking computer course may not help them to convince this course is important and worthwhile in their profession and educational life thus accordingly, they have not benefited from this course. Göktaş (2012) found that CSE of students was

affected positively after they took computer course. The findings of this study supported this partially. In our case, students who took the computer course had lower anxiety scores than students who had not taken computer course yet. Simultaneously, they have higher CSE scores than the students who have not taken computer course yet. But, the influence of this experience did not last long.

In this study, the students' CSE level was analyzed according to the grades taken from the computer course. It was found that there was a significant difference between DD and the all other grades, except DC. This means that DD is the threshold grade for students to influence their CSE. In terms of students, as long as they do not fail from the course their self-efficacy was not altered. When looked at, the CSE means of the students who took AA from the course was the highest 78.98. Çolak (2013) found a positive correlation between the CSE and the computer grades similar to this work.

The results on the frequency of the computer usage by sport management students show that more than half of the students spend time with computers every day. The CSE of students who said they use computer every day and the ones who use computer several times a week is very close to each other. At this point, we need to questioned students' computer usage. They might use computers communicate with family and friends, gaming or chatting rather than through study related activities. Computer self-efficacy is associate rather to the quality of experience than to the amount of time spending with computers. These results were supported by Özçelik and Kurt (2007). According to the Compeau and Higgins (1995), as the computer usage increases, the computer self-efficacy level is supposed to increase too.

Conclusion

It is quite important that youngsters who will be professions in the future competencies in using technological tools such as computer in the information age. Because individuals who cannot follow the innovations in technology and cannot use the technology adequately in their professional life will probably be affected negatively. Hence this study focuses on computer self efficacy which is thought to be determinative in the efficient use of computers. Although there is no difference between males and females in terms of computer self-efficacy in the study, the high level of anxiety of female students indicates that they should be encouraged in technology. The difference between DD which is the lowest grade in the search and other grades and if they have computer training or not seems as a factor effecting computer self efficacy. In conclusion it can be said that, educational environment gives opportunities for sport management students to use computers effectively. In this case computer training needs to be supported for sport management students.

LIMITATIONS AND RECOMMENDATIONS

This study is related with computer self-efficacy of sport management students. When it was considered the rapid development in Information Technologies (IT), the topic of current study may look like noncurrent. But computer courses are provided for university students as a main course for technology training so to study about computer self-efficacy became a meaningful in the field of sport management in Turkey. Thereby, researchers' first priority was to study in this area but in future studies it is suggested that to focus usage of new technologies in sport management or for sport managers.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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Full Length Research Paper

Students' abstraction in re-cognizing, building with and constructing a quadrilateral

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This study aims to implement empirically students' abstraction with socio-cultural background of Indonesia. Abstraction is an activity that involves a vertical reorganization of previously constructed mathematics into a new mathematical structure. The principal components of the model are three dynamic nested epistemic actions: recognizing, building-with, and constructing. This study identified the abstraction profile of a junior high school student in constructing quadrilateral relationship. The student was asked a question related to quadrilateral. The interview was developed based on her answers by using keywords, "what, how, or why". The result of the student's abstraction and attributes were used to recognize the differences and similarities of quadrilateral shapes, building-with attributes by linking the characteristics of every two quadrilaterals, and constructing a network of relationships among quadrilaterals by drawing a figure of such networks.

Key words: Abstraction, recognizing, building with, constructing, quadrilateral.

INTRODUCTION

Abstraction has been a central issue in mathematics and science education for many years (Kidron and Dreyfus, 2008). Abstraction also has become the object of intensive research in philosophy. Plato saw abstraction as a way of achieving eternal truth, but Russell characterized abstraction as one of the highest human achievement (Hershkowitz et al., 2001).

Hershkowitz et al. (2001) suggested that in order to identify an object as an example of an abstraction, then someone must have a little knowledge about abstraction. Abstraction process starts from the beginning of an abstract entity towards a complex structure. In this study, we need a cognitive mechanism of abstraction, which constructs the existing ideas to be more complex.

Abstraction is a vertical reorganization of mathematical concept activities contracted into a new mathematical structure (Kidron and Dreyfus, 2008; Kouropatov and Dreyfus, 2014). For example, in a construct of the relationship that exists between two shapes (square and a rectangle), a grade nine student has them as an abstraction, because he has learned them previously in class. If the rectangle is described as having "sides of the same length" then it tantamount to the characteristic of a square. He could construct that if quadrilateral is a square, then it is also a rectangle. The results of this construction are more complex than the initial concepts for students.

Guler and Arslan (2015), Hershkowitz et al. (2001) and

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Tsamir and Dreyfus (2002) divided abstraction into three epistemic actions: recognizing, building with and constructing. Recognizing is identifying a mathematic structure in a previous knowledge construct. Building with comprises the combination of recognized constructs in order to achieve a localized goal, such as the actualization of a strategy, justification or the solution of a problem. Constructing consists of assembling and integrating previous constructs by vertical mathematization to produce new construct.

Empirical abstraction is a vertical reorganization of mathematical concept that has previously been constructed to become a new mathematical structure based on Indonesian social-cultural background. But according to the non-classical approach, abstraction is an activity which corresponds to mathematical constructions and a process of constructing knowledge. The advantages of these definitions are in the mathematical concept combined, restructured, organized and built up to be more abstract or more formal. The activities used in these definitions are recognizing, building with and construction, and the context of these definitions is the relationship that exists between quadrilateral and the social background of junior high school students.

The researcher intends to identify the profile of a student's abstraction namely "*Prakasita*" in showing the relationship that exists between quadrilateral and the background of junior high school students in Indonesia. This student was selected, because according to the research of Berry and Dasen (1974), background has an effect on cognitive organization individually. In Indonesian culture, there is a high tendency for students to perform poorly in communication, both spoken and written forms. This is different in the western culture, where students are able to communicate their thoughts in spoken or written language and are accustomed to answer the "what, why and how" questions.

Abstraction has been become the focus of many research in various fields, including mathematics education (Hershkowitz et al., 2001). In Indonesia, abstraction is chosen because it has no research related to mathematical abstraction. The material of the research is geometry, because it is difficult for students; and quadrilateral material is a foundation for understanding other geometry topics.

The purpose of this study is to identify the profile characteristic of *Prakasita's* abstraction in recognizing and understanding the characteristic of quadrilateral, building with two quadrilateral characteristics and constructing the relationships that exist between quadrilaterals.

MATERIALS AND METHODS

Terminology

Eddie and Tall (2007) noted the term 'abstract' has its origins in the

Latin "ab" which means "from" and "trahere", "to drag". Gramatically, to abstract (verb) is a process, to be abstract (adjective) is a property and an abstract (noun) is a concept. Abstraction has two definitions: abstraction is the process of describing a situation and abstraction is the concept of processing result. It is the result and process of reorganizing vertical mathematical concept which has been constructed earlier into a new mathematical structure.

Freudenthal (1991) provided what mathematicians have in mind when they think of abstraction. Freudenthal has brought forward some of the most important insights into mathematics education in general, and to mathematical abstraction in particular. These insights constitute a cultural legacy that led his collaborators to the idea of vertical mathematization (Treffers and Goffree, 1985). Vertical mathematization points to a process that typically consists of the reorganization of previous mathematical constructs within mathematics and by mathematical means, by which students construct a new abstract (Dreyfus, 2015). Reorganizing activity is a process of collecting, compiling, organizing, and developing mathematical elements into a new element. Vertical reorganization is a reorganizing activity which changes an abstract form into a more abstract form or more formal than the original.

According to Bikner-Ahsbabs (2014), Celebioglu and Yazgan (2015), Hershkowitz et al. (2007) and Yilmaz (2014) reorganization of mathematical structures occurs through three epistemic actions: recognizing, building-with, and constructing which can be distinguished in any processes of abstraction. Reorganizing is an activity of identifying the characteristics of a quadrilateral. Building with is an activity of combining the characteristics of two quadrilaterals.

Construction is an activity of reorganizing the characteristic of the quadrilateral into a new structure not owned by students. Re-organizing, building with and construction activities do not always have a linear shape, but they can occur at the same time. They have been validated and useful for describing and analysing the processes of abstraction of other contents, in other social settings and other learning environments. They have been established by a considerable number of research studies including ours (Bikner-Ahsbabs, 2004; Dreyfus and Kidron, 2006; Ozmantar and Roper, 2004; Ron et al., 2006; Stehlíková, 2003; Tabach and Hershkowitz, 2002; Tabach et al., 2001, 2006; Tsamir and Dreyfus, 2002; Williams, 2002, 2003, 2004, 2005; Wood and McNeal, 2003; Wood et al., 2006).

The profile of abstraction is a natural picture of the vertical reorganization of mathematical concept which is constructed earlier to becoming a new mathematical structure (Ergul, 2013; Halverscheid, 2008). Network of relations between a quadrilateral is a representation of the relationship that exists between two shapes that are gridded, charts, graphs, or schema. The diversity of abstraction lies in their differences or similarities; abstraction can either be a process or a result. The quadrilateral network relationship is parallelogram, rectangle, rhombus, square, kite, trapezoid. The representation of a quadrilateral is the shape of a "framework".

Symposium of the American Educational Research Association (AERA, 2004) postulates that four alternative conceptions of abstraction have emerged in an effort to formulate abstraction in a way that is compatible with a situated cognition perspective:

1. Situated abstraction
2. Abstraction in context
3. Collective abstraction, and
4. Actor-oriented abstraction.

Situated abstraction highlights the central role of mediating tools and in particular symbolic tools (Noss and Hoyles, 2002). The artifacts and symbol system have an important meaning in mathematics. Mathematical knowledge can be tied to the ways in which it is learned and used in a socio-cultural practise, yet

simultaneously it can be expressed in ways that exhibit invariant mathematical relationships (Hoyles et al., 2001; Noss and Hoyles, 1996; Noss et al., 2002).

While Noss and Hoyles et al. (2002) developed their notion of situated abstraction in relation to the conceptual resources students already have at their disposal, Hershkowitz et al. (2001) developed the idea of abstraction in context by saying that knowledge is constructed within a social practice. They argued that abstraction is a vertical reorganization activity of mathematical concept which had been constructed earlier into a new mathematical structure. Collective abstraction is an activity where members of a community collectively contribute at the beginning or end of activities in real terms. In abstraction, everything that is done before and after successively become the object of reflection (Cobb, 2004).

Actor-oriented abstraction is a modification of the two reflective aspects of Piaget (Lobato, 2004). First, effective abstraction is a construct of individual psychology and does not explicitly contribute to the environment, artifacts, curricular tasks and other activities of abstraction. The second is high-level reflective abstraction, which involves decentralization. Abstraction-oriented approach uses the concept of focusing attention on coordinating social and individual levels of abstraction. In abstraction, individuals identify the regularity of mental activity records with a focus and isolate the important properties required, as well as remove properties that are not needed. Social abstraction involves identifying notes, with focus namely on mathematical properties or order emerging as a result of the focus of students when interacting with the environment such as diagrams, strategies and representation.

The main idea of cognitive theory, context is seen as a task or other characteristic of the experimental conditions which is considered to affect the occurrence of mathematical thinking. There are abstraction in condition, abstraction in context, and abstraction-oriented actors in different contexts. Noss and Hoyles (1996) give an idea of the context and symbolic roles and artifacts that are generally used as a means of action and communication. Cobb (2004) takes context into collective class where students participate in and contribute to the collective class. Lobato (2004) shifted from viewing context from the point of view of the researcher as something inherent in the situation where the researcher can manipulate in considering context from the point of view of the actor.

Davydov (1990) suggested the beginning of abstraction consists of three parts. First, abstraction stems from its early form, the simple, not yet to be developed form; there needs to be consistency both the internal and external. Second, the development of abstraction in the progress of the analysis, from the early stages of abstraction, towards synthesis, and finishing with a final form that is consistent and complicated. Third, abstraction does not run from the concrete to the abstract, but from an abstract form that has not evolved into an abstract shape that develops. The definition of abstraction as an activity is in line with mathematical constructions.

The relationship between quadrilaterals

Definition is an important part of geometry. According to Soedjadi (2000), the definition of a concept is "a phrase that can be used to limit the concept". Quadrilaterals such as parallelogram, rectangle, square, rhombus, trapezoid and kite are examples of concepts, while "a parallelogram is a quadrilateral which has a pair of opposite sides equal" is an example of definition. This definition limits the concept.

Soedjadi (2000) distinguishes definitions into three; they are analytic, genetic and formula definitions. In geometry, formula definition is used. An analytic definition mentions genus Proximum (immediate family) and deferential specifically (special distinction).

The definition of parallelogram above is an analytic definition of the genus proximum "quadrilateral" and deferential specifically, "has a pair of opposite sides equal". Genetic definition is a definition that indicates or reveals the occurrence or the formation of the concepts defined. An example of genetic definition is "kite is a quadrilateral shape if two isosceles triangles are congruently combined with pedestal base". There are four elements of the definition: background, genus, defined terms, and attributes. From the example of parallelogram definition above, the background is shaped, the genus is quadrilateral, defined terms are parallelogram, and the attribute is a pair of parallel opposite sides.

Definitions used in the quadrilateral have an impact on the relations between shapes. If the trapezoid is defined as, "a quadrilateral has exactly one pair of parallel sides" or "quadrilateral pair of parallel sides", then both different definitions will have an impact on the relations between the shapes. If the first definition is used, then the set of parallelogram and the set of trapezoidal are disjointed, but if the second definition is used, then the parallelogram set is a subset of the trapezoidal set. Parallelogram can be defined as follows:

1. Parallelogram is a quadrilateral with two pairs of opposite sides parallel
2. Parallelogram is a quadrilateral with two pairs of opposite sides of equal length; and
3. Parallelogram is a quadrilateral with a pair of opposite sides parallel and of equal length.

These definitions are the same. According to Soedjadi (2000), these definitions have an extension (reach) that is equal; and two or more definitions that have equal extension is called definition equivalent. Poespoprojo (1999) said that extension is the whole of an idea that can be applied or an environment (a concept) that may be appointed by the concept. Attributes are used when an object:

1. Has two pairs of sides that are parallel
2. Has two pairs of sides of the same length
3. Has a pair of sides that are parallel and equal in length.

However, according to Soedjadi (2000), it has a different definition. The definition of parallelogram constructed by the student is said to be accurate if it is equivalent to the definition earlier started. A rectangle can be defined as follows:

1. Rectangle is a quadrilateral that has two pairs of opposite sides equal and a right angle
2. Rectangle is a quadrilateral that has two pairs of opposite sides of equal length and a right angle; and
3. Rectangle is a quadrilateral that has a pair of opposite sides parallel and equal in length as well as a right angle.

Thus, these definitions have equal extension but different intention. Rhombus, square, trapezoid, and kite are defined as follows: rhombus is a quadrilateral that four sides of equal length, square is a quadrilateral that has four sides of equal length and a right angle. Kite is a quadrilateral that two pairs of adjacent sides of equal length with the sides not overlapping; trapezoid is:

1. Quadrilateral that has a pair of opposite sides equal; or
2. A quadrilateral that has exactly one pair of parallel sides.

If the analytical definition is used, then the parallelogram is a rectangle that is a right angle; rhombus is a parallelogram whose four sides are equal or kites whose four sides are equal; and square is a rectangle whose four sides are equal or square is a rhombus with right angles. If the definition of a trapezoid is a

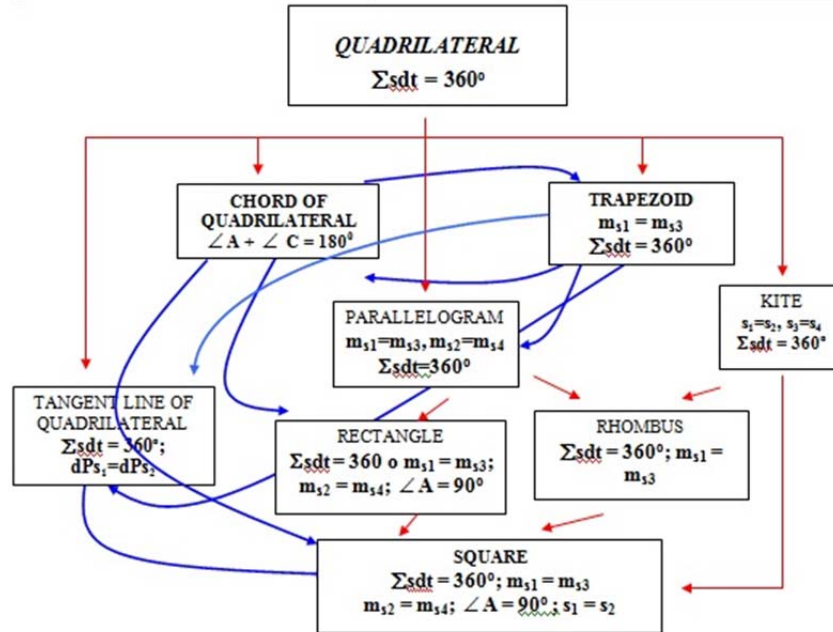


Figure 1. Map concept of quadrilateral (based intension definition).

rectangular with a pair of opposite sides equal, then a parallelogram is a trapezoid with two pairs of parallel sides. The map concept was strongly influenced by the sound definition (semantic) used or preferred relationships. Given quadrilateral ABCD, $\overline{AB} = s_1$, $\overline{BC} = s_2$, $\overline{CD} = s_3$, then $\overline{AD} = s_4$ and with gradient respectively m_{s1} , m_{s2} , m_{s3} , m_{s4} . If P is the center of the circle in quadrilateral ABCD, then dP_{s1} is the distance from P to the side s_1 . Budiarto et al (2017) also described quadrilateral relationship in Figure1. Red colour indicates analytical definitions; while blue indicates a result that is related to the red color.

The diagram in Figure1 shows that the position of the quadrilateral chord and the trapezoidal are equal, because both definitions of quadrilateral have two requirements. Likewise, parallelograms and kites are at equal level, because both definitions of quadrilateral have three requirements. Quadrilateral line tangent, rectangle and rhombus are also equal, because the definitions of quadrilateral have four requirements. Square is at the lowest level because its definition has five requirements. Some results of drawing charts that consider position or level are:

1. If one condition of quadrilateral chord is added, then it would be trapezoid.
2. If three conditions of quadrilateral chord are added, then it would be a rectangle.
3. If the four conditions of quadrilateral chord are added, then it would be a square. Likewise, it is a trapezoid if it needs one requirement to be a quadrilateral chord or a parallelogram; if it needs three requirements, then it is a quadrilateral tangent line.

METHODOLOGY

This is a qualitative research which explores students' abstraction in constructing the relationships between quadrilaterals. The subject of the research is Prakasita, a grade 9, Junior high school of Hang

Tuah 1 Surabaya, Indonesia. The data of the research were collected by using a task-based interviews (Tsamir and Dreyfus, 2002).

Recorded clinical interviews and audio visual equipment were used as a data collection technique. Clinical interviews were used to collect information of a subject's abstraction as a material to draw conclusions. The instrument of the data in this research was the researcher and the supporting instrument was the interview guideline. The interview guidelines were carefully planned and tested on some students from Junior High School Laboratorium of Universitas Negeri Surabaya and from junior high school in Surabaya.

The students were able to recognize quadrilaterals if they could identify their different and similar characteristics and understanding their definitions. They were able to build with the characteristics of two rectangles by combining the characteristics of the two rectangles. For example, by combining the characteristics of a square and a rectangle, they were able to get a square. The students were able to construct, if they reorganized the characteristics of two rectangular structures to become new structures. For example, the students have built the relationship that exists with a rectangle and a square and constructed a network that connects the two shapes.

Attributes are said to be true if the definition of mathematics it is true or have an equivalent with related models of planes. Attribute is said to be non-routine if the attribute was not commonly used in mathematics textbooks to build understanding of the quadrilateral, such as "the diagonal is perpendicular" or "having two axes of symmetry". Attributes are not meaningful if generally attribute does not build understanding of quadrilateral, such as attribute "has an acute angle", "has a hypotenuse", "resembles a rhombus" or "adjacent sides are not equal". The definition of a quadrilateral is accurate, if the attributes used to identify the definition are appropriate. Such as "a rectangle is a quadrilateral with two parallel pairs and a right angle" is an accurate definition. If the results of a series between two shapes and analytically accurate definitions of the subject is more than any other subject, so this subject has better abstraction.

Table 1. Attributes used to distinguish and re-organize the similarity of some models of quadrilateral.

Name	Attributes To recognize	
	Difference	Similarity
Parallelogram	The length of side; The size of angle	Two pairs of opposite sides parallel; Two pairs of opposite sides are equal
Rhombus	The length of side	The opposite of angles are equal; The length of two pairs of opposite sides are equal; The length of four sides are equal
Rectangle	Length; Width	Two pairs of opposite sides are parallel; All of angles are right angles
Square	The length of side	Two pairs of opposite sides parallel; The length of two pairs of opposite sides are equal; All of sides are equal; All of angles are right angles
Kite	The length of side	A pair of opposite angles are equal; Two adjacent sides are equal in lengths
Trapezoid	The type of trapezoid	Have 4 of sides; One pair of opposite sides parallel

The analysis process was done after the interview was completed. The analysis began by examining the data, then comparing the data with the transcript of the video recordings. The next step was reduction data, collating data, categorization, coding, examination of data.

RESULTS

The activities of plane are grouped into two phases:

1. Grouping of plane into triangular and quadrilateral groups. Attributes used to classify them were the number sides.
2. Planes were grouped into parallelogram, rectangle, rhombus, square, kite, trapezoid, and irregular quadrilateral. The attribute used to classify them was the name of the shape.

Attributes were used to distinguish some models of quadrilateral and re-organize the similarity of some models of quadrilateral are presented in Table 1. According to Prakasita, the definition of quadrilateral are:

1. Parallelogram was a quadrilateral that had two pairs of opposite sides parallel and equal in length
2. Rectangle it is a quadrilateral with two pairs of opposite sides that are parallel and equal in length, and also had four right angles.
3. Rhombus is a quadrilateral with four sides of equal length
4. Square is a quadrilateral with two pairs of opposite sides that are parallel and equal, has four right angles and four sides that are equal.
5. Kite is a quadrilateral with two pairs of adjacent sides that are equal in length; its sides do not overlap, and has a pair of opposite angles that are equal.
6. Trapezoid is a quadrilateral with parallel opposite sides, but are not equal.

The results of building with process presented by Prakasita were:

1. Rectangle should not be called only parallelogram, but

is parallelogram with four right angles; so rectangle is parallelogram, but parallelogram is not rectangle.

2. Rhombus is parallelogram with equal four sides; rhombus is parallelogram, but parallelogram is not always rhombus. 3. Square should be called a parallelogram, because a square has four equal sides and four right angles; so square is parallelogram, but parallelogram is not square.

4. Kite is not parallelogram and parallelogram is not always a kite.

5. Parallelogram is not a trapezoid and trapezoid is not always parallelogram.

6. Rhombus is not a rectangle and rectangle is not always a rhombus.

7. Square should be called a rhombus with four right angles; so square is a rhombus but a rhombus is not always square.

8. Rhombus is a kite and kite is not always a rhombus.

9. Rhombus is trapezoid and trapezoid is not always a rhombus.

10. Rhombus is trapezoid and trapezoid is not always a rhombus.

11. Rectangle is not a kite, and kite is not always a rectangle.

12. Rectangle is a trapezoid and a trapezoid is not always a rectangle.

13. Square is a kite and kite is not always a square

14. Square is a trapezoid and a trapezoid is not always a square; and

15. Trapezoid is not always kite and kite is not always a trapezoid.

Prakasita recognized the characteristics and definition of quadrilateral, built with the characteristics of two rectangles, then she constructed inter quadrilateral network of relationships (Figure 2). The arrows from A to B show the characteristics possessed by shape B are included in shape A. The number on the arrow indicated the sequence activities of quadrilateral relationship network creation.

Based on analytical definition, there was a decrease in

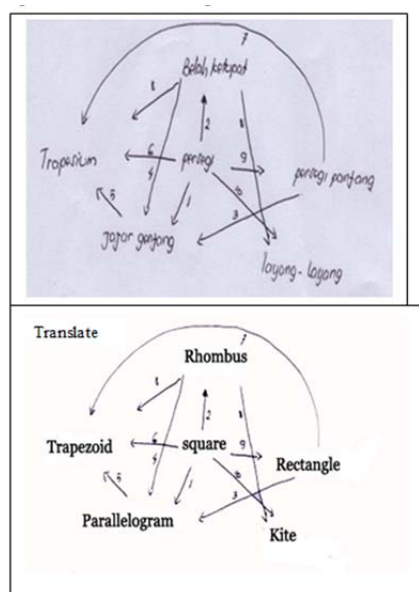


Figure 2. Network relations between the quadrilateral made by Prakasita.

the relationship from 17 possible relationships into 8 possible relationship. It happened because a genus was used, but it was not Proximum that was used. Prakasita defined trapezoid as a quadrilateral with a pair of parallel sides and a kite is a quadrilateral with two pairs of equal adjacent sides that do not overlap. Therefore, it could be interpreted that Prakasita defined quadrilateral analytically.

1. Rectangle is a parallelogram with a right angle.
2. Rhombus is a kite with four equal sides.
3. Square is a rhombus with a right angle.
4. Rhombus is parallelogram with four equal sides.
5. Square is a rectangle with four equal sides.
6. Parallelogram is a trapezoid with two pairs of parallel sides.

There are 21 possible relationships of quadrilateral between parallelogram, rectangle, rhombus, square, trapezoid and kite. Based on these possibilities, there are only 17 possible relationships. This is caused by the definition of trapezoid as a quadrilateral with a pair of parallel sides. However, Prakasita mentioned 11 out of 17 possible relationships. Six relationships not mentioned by Prakasita are those between quadrilateral with parallelogram, rectangle, rhombus, square, trapezoid and kite.

Prakasita could accurately recognize 1 definition, build relationship of two quadrilaterals including 11 relations of shapes, and construct 4 analytic definitions indicated with the blue line. If the accuracy of the definition is not

considered, then she could give 6 definitions, build relationship of two quadrilateral including 11 relations of shapes, and construct 6 analytic definitions indicated with the dotted lines. Prakasita could recognize a possible definition, the relationship of two rectangle, and give analytic definition indicated with red lines (Figure 3).

DISCUSSION AND CONCLUSION

Based on the aspect of psychology, personality, talent and behavior, Prakasita had an important role in the interview process. Prakasita has tremendous cognitive and communicative abilities in the interview process. In some conditions, Prakasita has a higher thinking level than hers friends. Her mathematical understanding is very good, such as: she explicitly stated that the formula of trapezoid could be used to calculate the area of shapes that have the equal characteristics with a trapezoid having a pair of opposite sides that are parallel. Prakasita showed that the formula of area trapezoid can be used to calculate other shapes with equal characteristic with it.

When comparing the equal characteristics, Prakasita explained what to do and why to do it. Specifically, Prakasita could reflect on what she done without the help of the interviewer. She could progress beyond what is expected; like the formula of trapezoid area could be used to find the area of parallelogram, rectangle, square and rhombus, as described below.

In Figure 4, Prakasita could use the analogy of a trapezoid area in determining the other areas of quadrilateral. This is in line with the research work of Black and Solomon (1987), where they found that analogies helped students to learn. They interpreted this finding from a constructivist view. Analogies were helpful because they allowed the students to construct their own knowledge by forcing them to view the new knowledge within the framework of the analogy.

Based on the first didactic aspect, Prakasita still used the model shape in abstraction. Therefore, in the study of geometry, the students still need learning tools, especially students who have the same character with Prakasita. Second, in making a network between two shapes, Prakasita defined trapezoid as a quadrilateral with a pair of parallel sides. In real learning process at school, understanding the definition of trapezoid could be used is quadrilateral that the exactly pair of parallel sides. Therefore, in learning trapezoid, the teacher should explain that both definitions are true.

The subject created relationships between the areas of trapezoid are presented in Figure 5.

Prakasita worked on two levels consistently. She responded to the questions from the interviewer and analyzed them. She tried to find the hidden connections between the areas of a trapezoid with the areas of other

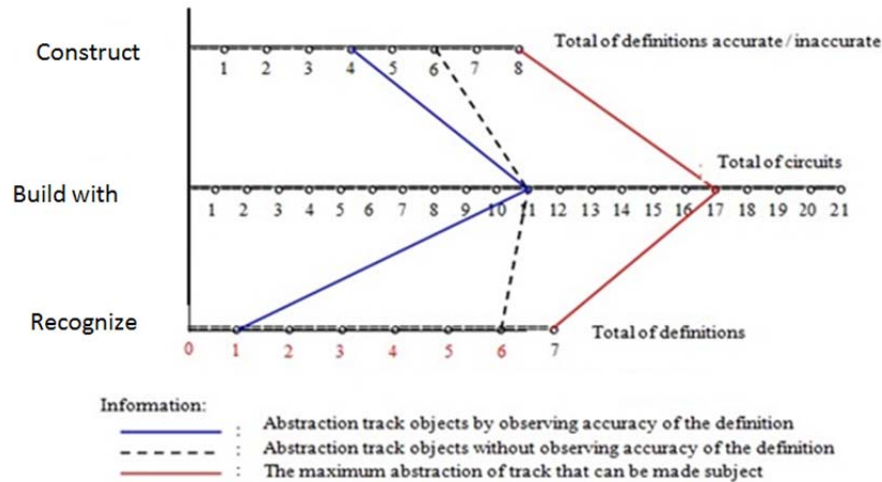


Figure 3. Profile of abstraction Prakasita (Inaccurate definition caused by excessive attributes, both routine and non-routine).

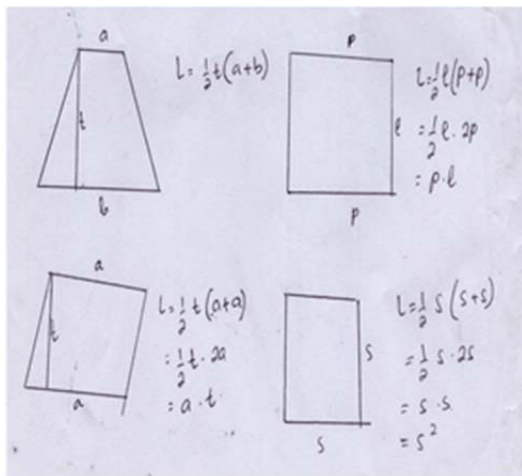


Figure 4. Prakasita determined the formula of area parallelogram, rectangle, square and rhombus.

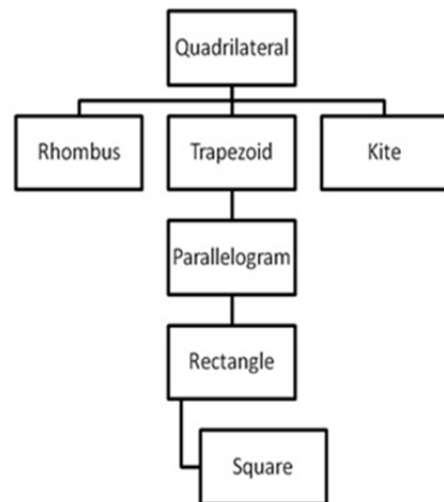


Figure 5. Relationships between shapes with the area of trapezoid made by Prakasita.

shapes which have equal characteristics with trapezoid. She believed that she was directed to a destination, but had no idea about it. When she finally realized that she was directed to make a network of relationships quadrilateral, she identified the related information that is not simple. However, based on the interview result, she not only provided information about the didactic validity of the teaching interview-based, but also showed sufficient detail of the abstraction during the interview.

Based on the theoretical, the analysis of the subject showed that Prakasita's abstraction process was nested. In this process, Prakasita recognized the structures which she constructed and assembled these structures to fulfill what was asked in the interview process. The design of the interview was aimed to create a network of relation-

ships of quadrilateral and offered an opportunity to exit recognized knowledge and construct new structures for Prakasita. As it is known, establishing relationships between variables indicates that mental activities are used. With the fact that abstraction covers the processes that require new structures, constructing new abstract phenomena (Dreyfus and Tsamir, 2004) is taken into consideration. It is observed that abstraction was realized in the study. In this activity, Prakasita recognized, built with and constructed two quadrilaterals relationships which are not nested but more like a series of chain. In other words, constructing, recognizing and building with are linear activities.

Other research results indicated that Prakasita tend to

use the rectangle and a parallelogram model, so that rectangle could not be called only a parallelogram. As the characteristic of rectangle is in a parallelogram, Prakasita argued that the rectangle is a parallelogram and parallelogram could not be called a rectangle. She clearly distinguished between the names of shapes and relationships of the equal characteristics of the two shapes. But when determining the relationship between the trapezoid and parallelogram, rectangle, square and rhombus, she suggested that a rectangle could be called a trapezoid and a rectangle is a trapezoid. These results indicated that there is a change in Prakasita's abstraction. Based on the category of Alessi and Trollip (1985), a principle is physical when physical changes are to be observed by the learner, like the case of Prakasita's simulation. All other procedures and principles are non-physical. Generally, Prakasita uses iconic procedure and not symbolic procedure.

This study has not revealed the transitive characteristics of network connections created by Prakasita, such as if the characteristics of shape A are owned by shape B and the characteristics of shape B are owned by shape C, then the characteristics of shape A are owned by shape C. The researcher did not look at the personal background of Prakasita, because of the limited data that could be collected. Teachers' background and the geometry learning process of the student have not been revealed. If those processes are done, the result of the abstraction profile of Prakasita in constructing quadrilateral relationship will be different from the result of this study.

Conflicts of interest

The author has not declared any conflict of interests.

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Full Length Research Paper

Comparative review of selected educational policies of 1st and 2nd cycle institutions in Ghana and Burkina Faso, and that of United Kingdom and United States

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This article examines some selected Educational Policies of First and Second Cycle Institutions in Ghana and Burkina Faso, in comparison with that of the UK and US. The purpose of the study is to itemise the commonalities and differences in Educational Policies of both developed (UK and US) and developing countries (Ghana and Burkina Faso) in order to learn from the developed countries where necessary, and to improve upon the Educational Policies and Practices in Africa. Data collection for the study includes documents studies that involve integrated literature review. Content analysis is used as the method for data analysis. The results show that several Educational Policies of the countries under review conform to the UN Educational Policy standards and could be adopted in similar context in Africa.

Keywords: Comparative review; Educational policies; developing countries; developed countries.

INTRODUCTION

Prior to the arrival of the Europeans on African soil, several traditional educational systems were in existence and these included traditional educational systems, which were the norms preserved in Sub-Saharan Africa. Islamic imperialism had less presence in South-Saharan Africa and Koranic Education was not yet established in Burkina Faso.

Before the introduction of European systems of education in Africa, every ethnic group at that time was responsible for its own educational system thereby creating a diversity of practises and knowledge of education which marked the African traditional education system.

Lavoie (2008) in his arguments highlighted notable features of indigenous schools in Sub-Saharan countries before the arrival of the Europeans, which include economic activities such as farming, cattle breeding and weaving. The rest were development of a sense of community; participation of parents and the extended family; oral transmission of knowledge and the link between knowledge and community needs.

Kwapong (2008) said Ghana, a Sub-Saharan African country, also experienced triple heritage education, namely: African Tradition Education, Islamic or Arabic Education and Christian European Education. Addae-Mensa (2006) reiterates that the Colonial Government

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and the foreign missionaries introduced European education into Ghana.

By 1529, the Portuguese had established a school in Elmina Castle. The Dutch had also opened a school in Elmina in 1644, while the English founded a school in Cape Coast afterwards. Addae-Mensa (2006) maintains that in the early 19th century, the native people in Ghana were converted and educated by the Basel, Bremen Missionaries and the Wesleyan Methodists.

The Basel Missionaries established a boys' school at Akropong Akuapem, followed by a girls' school in 1847. Bremen also started its first school in Peki in 1847. In 1836, Wesleyan Methodist built the Wesley Girls School which became a secondary school in 1884. According to Kwapong (2008), from 1880 to 1881, there were 139 schools in the colony and only three were Colonial Government Schools. Beeko (2005) asserts that the Basel Missionaries had a policy for equal access to education, and after the European left the shores of Ghana, the government of Ghana continued to maintain the educational policies implemented in the country by the Europeans.

Rutkowski (2007) remarks that nearing the end of the twentieth century and the early part of the twenty-first century, governments in African countries through enactment of legislation and formulation of policies have carried out educational reforms in order to improve students' enrolment, participation and outcomes. The intuitions for these reforms are to ensure openness, proper management of the tax-payer's funds, accurate accountability of how expenditures were financed and achievement outcomes for all students. Inter-governmental organisations have played a notable role in educational policy-making at the national level.

Rutkowski (2007) states that these organisations encourage world change, and promote particular ideologies through a set of complex actions and policy recommendations that exploit growing world interconnectedness. Levin (1998) argues that the formulation of educational policies has permeated the global agenda. Formulating Education policies have been the function of the state government in its decision to manage, control and turn society around and, in particular, transform and improve educational provision.'

Osman (2002) maintains that policy refers to a detailed statement that demonstrate vision and aspirations, and provides guidelines for carrying out those vision. It is also seen as a standard decision rule, a regulation, or a set of prescriptions that apply in all similar situations. Osman (2002) on his part, views policy as the outcome of political influence, which determines and sets limits to what the state does. Policies churned out by governments of nations to deliver social goods to the populace are termed public policies. Rutkowski (2007) defines policy knowledge as 'the body of knowledge available to assist policy-makers in their understanding of the causes and consequences of the outputs of government and the subsequent society impact.

Arguing in favour of this assertion, Anderson (1975) notes that public policy is when a government initiate a course of action in order to solve a social problem, and adopts a specific strategy for its planning and implementation. Thus all countries, whether developed or developing, design public policies to provide social services for their citizenry in the areas of education, health, housing, roads and transport, and food and nutrition among a host of others.

Education policy is the principles and government policy-making in educational spheres as well as the collection of laws and rules that govern the operation of educational systems. Education policy or public education policy also refers to government decision rules regarding education, schools, colleges, or related matters. Examples are government rules regarding school attendance, graduation, college entry, content for study, teachers, payment, etc. Government, sector Minister, Governors or Regional Ministers, Mayors, Municipal and District Chief Executives executive's orders as well as statutes and ordinances enacted by legislative bodies and judicial decisions issued by courts are some of the means by which educational policies emerge. It is expedient to put forward that there are equally bottom-up processes that might also influence educational policy. Also, there are several hints in the current literature that shows that actors on the bottom level have their own educational ideals.

In order to appreciate the educational policies of developed and developing countries, it is important to distinguish between a 'developed' and a 'developing' country. World Bank (2012) maintain that the criteria for appraising the degree of development from a socio-economic perspective are: Gross Domestic Product (GDP), the per capita income, level of industrialisation, amount of widespread infrastructure, literacy rate and general standard of living.

Developing countries are agrarian and less industrialized, have low educational level, poor employment, high infant mortality rate, unsafe and unreliable water supplies, poor housing conditions, poor nutrition, poor health care services, low to medium standard of living, limited technological capacity, unequal distribution of income and factors of production. Examples of developing countries are Albania, Algeria, Angola, Bangladesh, Chad, Code D'Ivoire, Burkina Faso, Ghana, Gabon, Benin (IMF Advanced Economies List 2003, p.173.)

A developed country is a well-developed postindustrial economy marked by high technology advancement and where the service sector contributes immensely to GDP than the industrial sector. It has higher education rates, better roads, stable governments, good health care, high level of per capita income per capita, high index for Human Development, increased life expectancy, good housing conditions, safe water supplies and abundant food supplies. Examples of such countries are UK, Japan, Canada and the United States. According to the

International Monetary Fund, advanced economies comprise 65.8% of global nominal GDP and 52.1% of global GDP (PPP) in 2010 (IMF, 2011). In 2011, the nine largest advanced economies by either nominal GDP or GDP (PPP) were Germany, France, United States, the United Kingdom Japan, Italy, Canada, Spain and South Korea (IMF, 2012).

From the field of Education, the definition of developing and developed countries is different from the meaning given in the field of Economics. In the field of Education, a developed country is the one whose citizens and other members in the country have the requisite knowledge, skills and disposition needed to enable them live a meaningful life. The products or outcome of this experience or state of development (high GDP, infrastructural development, high per capita income etc.) of these citizens or the nation is what Economists see as development.

Formal education is a global activity and a critical social issue that needs attention and effective management in that the degree to which citizens of a country are well educated determines the extent of the country's development. Educational policy programmes, structures and management have different policy implications for the developed and developing countries. This provokes intellectual research and academic discourses. This article is a comparative review of some education policy reforms in US and UK against Ghana and Burkina Faso. The study brings our attention to the need to expand our understanding of educational policy in developed and developing countries.

The key objectives of the article is to spell out the key similarities and differences in the education policy between Ghana and Burkina Faso matched against UK and US in terms of funding and educational development, performance improvement, free and compulsory basic and secondary education, accountability and standards expectations, government expenditure, budgetary allocation on education, increasing access, pedagogy, practicalised curriculum, quality of education and others.

Steiner-Khamsi (2004) said, within the remit of educational policy, it has been argued that globalisation is inspiring a global-scale convergence of national education systems, politics of educational borrowing and lending in relation to globalisation and education.

The comparison allows the identification of the strengths and weaknesses relating to various educational systems and policies in a particular system. The strengths could be improved and the weakness resolved. Adoption and adaptation of a particular educational policy in one country is then possible, if it suits the context of the other country. Bennet et al. (1975) also added that mutual learning, information sharing and improving educational systems are made very possible. Construction of a multilateral space to create and exchange policy knowledge is also a benefit. The comparison helps to explore the conformance to

international standards in educational reform.

For example, (United Nations (1948, p5) Article 26 of the UN's Universal Declaration of Human Rights adopted in 1948 provides that 'every person is entitled to free education at least in basic level. Rutkowski (2007) put forward that the International Covenant on Economic, Social and Cultural Rights which needed acceptance and validation by signing by the General Assembly in 1967, and went into force in 1976 states that primary education, technical and vocational education shall be free and compulsory for all. This study does not just try to explore various educational policies in primary and secondary schools, but also illustrates the differences and similarities and the relevance for the comparisons. In our view, there is little work done in this area in Africa, especially in the West African Region and Ghana in particular.

LITERATURE REVIEW

Madsen et al. (2014) demonstrate that Educational Policy Decision aims at the ensuring effective management of schools to ensure increased learning for all students regardless of race, ethnicity, or economic status. Academics have alleged that the success of educational reforms rests on the headmaster's ability to execute accountability policies. The meaning of policy is sometimes taken as legislative policy texts or other nationally driven interventions applied to 'solve a problem.'

According to Ozga (2000), this approach sees policy as an activity earmarked and carried out as a state mechanism of policy-making'. In contrast, we conceive policy reforms as a process that is diversely and repeatedly contested or subject to 'interpretation' as it is enacted in original and creative ways within institutions and classrooms. Thus, inclusion in policy is the discursive processes (Ball, 1994).

A close look at the educational policies of developed countries reveals that policies on financial support to schools, especially basic and second cycle schools, are tied to improved performance of students. Schools are often held accountable for poor performance in standardised tests. Examples can be found in the UK and the US. In the UK, the market reform policy introduced in the 1988 Education Reform Act (Adnett and Davies, 2002) was aimed at raising standards by introducing testing and league tables for schools as well as improving the accountability of state-funded schools.

Similarly, the US Education Policy on free and compulsory education which was signed into law on January 8, 2002 also ties funding for schools directly to accountability and standards expectations. Under the policy, schools must ensure that all students learn the essential skills and knowledge defined by the state using grade-level standards and benchmarks.

Thus, the free Education Policy demands that states build assessment systems that track the achievement of all students against a common set of high instructional standards. Hence, states are required to assess third through eighth grade students, annually, in reading and mathematics. Jorgensen and Hoffmann (2003) assert that these tests are based on state standards that are challenging, and the results are made public so anyone can track the performance of any school in the country.

In developing countries, funding for educational development was also provided. For example, Ghana Educational Trust (GET) Fund in the GET fund Act 2000 (Act 581), raised from the 2.5% of the Value Added Tax, was established to provide funding for the various strata of education. For the purpose of attaining this objective, the monies from the Fund are to be expended as follows:

1. To sponsor Ghanaian students' education
2. To generate revenue to develop and repair of academic facilities
3. To grant scholarships to the intelligent but needy students to pursue their education.

The issue of accountability and social auditing standards from the managers of the fund were however, not defined (Ghanalegal.com) thus opposed to what pertains in the developed world.

In addition, government of Ghana capitation grant policy was meant to contribute to an increased access and participation in primary education. This is in tandem with the millennium development goal. The Millennium Development Goals (MDGs) are the world's time-bound and quantified targets for addressing extreme poverty in its many dimensions- income poverty, hunger, disease, lack of adequate shelter, and exclusion- while promoting gender equality, education, and environmental sustainability.

The goal 2 is to achieve universal primary education. The introduction of capitation grants was meant to eradicate fees in basic schools in order to promote access to primary education. For the past 10 years, Burkina Faso: Ten-Year Basic Education Development Plan (2005) reveals that the World Bank, Netherlands, France, Canada, Sweden, Denmark, and Belgium provided a financial support to the first phase of literacy programme of increasing access to primary education through common financing procedures. Requirements for results reporting have been aligned with national systems, and harmonised between international donors, however, accounting for these donations have not been clearly prescribed.

An important difference between the Educational Policies of developed and developing countries is that, while in some developed countries basic and secondary education are free and compulsory, in developing countries only basic education is free and compulsory.

Developing countries are struggling to include the

secondary education group to benefit from free and compulsory education. The UK and US present typical cases of free compulsory basic and secondary Education Policy. Besides, the length of compulsory education in developed countries is longer than those in developing countries (Jin and Zhang, 2008). The input of compulsory education is determined by how much of the state's financial investment in education accounts for the national citizens' incomes or gross national product (GNP).

Comparatively, the GNP of developed countries is higher than that of developing countries. Therefore, Jin and Zhang (2008) disclosed that the investment in compulsory education of developed countries is certainly higher than that in developing countries. In the US for example, education is compulsory over an age range beginning between five to eight years and ending between sixteen to eighteen years, depending on the state (infoplease.com). This means free compulsory education starts from kindergarten to secondary Ghana and Burkina Faso.

Furthermore, while expenditure on education is high in developed countries, it is very low in developing countries. For instance, Bolton (2012) put forward that the US and UK spend 6 and 5.6% respectively of their GDP on education. In Ghana, although the government spends 6.7% of GDP in education, it is still very low because of the low GDP figure.

UNESCO's recommendation suggests that developing nations should commit not less than 26% of their total annual budget to the education sector if they are to attain any form of sustainable development (Abdul-Rahooof, 2014). This proposition was meant to ensure that many have access to education, improved quality of education and a reduction in the cost of education so that many learners could gain skills, knowledge and attitude required for meaningful employment, which contributes not only to personal life improvement, but societal development. The little budget on education in Ghana, coupled with policy implementation constraints have created the problem of access to education, equity consideration, quality of education, cost and financing of education. Ghana, like many other developing countries, guided by international protocols such as the Education For All (EFA) and the Millennium Development Goals (MDGs), has initiated several interventions to transform its education system. The 'Free Compulsory Universal Basic Education (FCUBE) is among the many initiatives that governments have introduced to address the many challenges confronting basic education delivery in these countries. These initiatives and interventions had sought, in many instances, to improve the education systems and to ensure that all school-going children have access to quality basic education. Ghana's Free Compulsory Education is for the basic schools only.

The Article 38 of the 1992 constitution of the republic of Ghana requires the government to provide free

compulsory basic education access; and depending on the availability of financial resources, apply same in senior secondary, technical schools, tertiary institutions and lifelong learning. This is based on the principle that to obtain a more equitable society, all individuals should, ideally, have access to equivalent learning opportunities, regardless of their socio-economic background, social origin, age or sex. Equity of access provides a strong base for developing social cohesion (Kwapong, 2010). Ministry of Education (1996) and Ghana Education Service (2004) argue that the establishment of FCUBE in the educational system of Ghana was meant to ensure the following objectives:

1. To boost teaching and learning quality; and to
2. To augment access and participation.

The policy aimed to support Education Policy and Management changes with main areas focused on more instructional time, lowering fees and levies, enhancing head teachers' management skills and motivation levels and streamlining school supervision and upgrading. The rest include: physical infrastructure and construction of additional classrooms and schools to accommodate increased access.

In practise, the policy meant that the government was supposed to finance free tuition, textbooks and teaching and learning materials, and subsidise the cost of exercise books. Parents are expected to provide for the nutrition, school uniforms, school bags, stationery and transport, if needed (Akyeampong, 2009). Key policy innovations to boost and re-energize the FCUBE policy execution process have not been successful.

Nordensvard (2014) demonstrates that although dropout rates are high, the disparity between the overall access of education to boys and girls remains unchanged. Committed to enhancing the educational opportunities and outcomes of the educationally disadvantaged, the FCUBE policy is perceived as a 'rights-based policy' grounded in-depth in social democratic values. However, Nudzor (2013) put forward that the influx of neo-liberal conceptual rhetoric of 'acumen for the world of work' has ignited the nullification of these progressive ideals.

Ghana's educational reforms and policies have been very much donor-driven, heavily sponsored by international organisations such as the World Bank and the International Monetary Fund (IMF) who have in turn shaped the discourse around education. These institutional organisations favour basic education as a more efficient investment. Another policy issue that several developing countries are pushing forward is that of special education for the physically challenged. This concern has steadily become part of the mainline discourses on global development and poverty alleviation.

The Millennium Development Goals (MDGs) which target the improvement of human conditions by 2015 unfortunately did not include in its first design, the

addressing of disability issues within targeting frameworks. Yet et al. (2015) maintain that it abounds in literature that these goals are unlikely to be attained unless more inclusive strategies for people with disabilities are integrated into existing plans. When Ghana became the first nation in Sub-Saharan Africa to declare independence, the government took full responsibility of providing for the educational needs of children with disabilities by passing the Educational Act of 1961.

The Ministry of Education (MoE) assumed control over the affairs of Special Education from the Ministry of Labour and Social Welfare in the late 1960s (Anthony and Kwadade, 2006). Ametepee (2015) said in 1970, the Special Education Unit (currently known as the Special Education Division [SED]) assumed full responsibility for special schools. Education is seen as being paramount to leading a better life. The benefits of education, such as gaining self-sufficiency and assisting society, go beyond employment.

However, inequity in educational avenues underpins some of the reasons for the widening of differences between those with physically challenged and their non-physically challenged counterparts. For example, education perceived as important for gaining employment, is not the case in reality, as young people face difficulties due to both physical and attitudinal barriers limiting their opportunities for economic and social participation. As a result, shaping educational policy to cover all aspects of education is very important. The UK and US have workable and enduring policy on special education. There is no inequality in educational policy with regards to special education and that of mainstream education.

Another significant difference between education policies of developed and developing countries is tuition fees. Whereas, tuition fees are charged in institutions in developed countries like UK and US, it is free in some developing countries like Ghana especially the public institutions. According to Machin and Vignoles (2006), a means-tested tuition fee was introduced in UK educational institutions in 1998. This has not yet been introduced in Ghana and Burkina Faso. Developing countries focus on centralised educational policy and administration while developed countries decentralise their education system and allow states and local districts to introduce policies to adapt education to their social, cultural, economic and political needs and aspirations. A good example is the US Educational System which allows states and local districts to determine the curriculum for public elementary education. The school district selects curriculum guides and textbooks that reflect a state's learning standards and benchmarks for a given grade level (US Department of Education, 2003).

Education Policy decision-making in developing countries is centralized because the state assumes the key role in policy making. Gindle and Thomas (1991) rightly noted that the state actors in developing countries

are frequently the most important actors in placing issues on an agenda for government action assisting alternatives and superintending implementation. The Senior High School (SHS) system has not been stable for an evaluation of its quality in comparison with the five-year secondary school and the two-year sixth form education it has replaced. This situation is in contrast with the highly stable Senior High School duration in the UK and the US.

The banking form of education is still in practise in developing countries. Students or pupils are not given opportunity to criticise the view point of the teacher, who can punish the student for such an attempt. Students, as passive absorbers, then naturally sit to listen to didactic recitations from teachers. The educational system of developed countries employs dialogue and problem-solving techniques to create a rich learning experience for learners. This builds their critical thinking abilities and their self-confidence. Educational Policies in the developing countries are less responsive to the demand of the environment.

In addition, support from societies as input for decision making is less significant, although the US and the UK have policies which are practically responsive to the demand of the society. Policies used in the industrially developed countries are mostly forcefully and wrongly adopted and applied in the developing countries, which normally does not fit due to contextual variation.

On the issue of commonalities between the developed and developing countries, there are similar educational policies that aim specifically at increasing educational access. In Ghana, the Education Act of 1870 was promulgated due to the report written by Matiew Arnold, who worked as inspector of elementary schools from 1851 to 1856. This aimed at building more schools and providing some financial assistance for the poor children in order to increase enrolment. The Accelerated Development Plan for education in 1951 also contributed to the expansion of enrolment, but was seen as elitist and created the unemployment of school leavers.

In the case of Burkina Faso, the major decisions faced by the country were to develop its educational system, which was to begin with the expansion of primary education despite the budget constraints and strings. Its first policy after independence in 1960 was to devise the following options: use rural non-formal education to provide education for its rural people or continue the traditional primary school in the urban areas in order to ensure that everyone had access.

This was to be based on the French model: six years of primary schooling and seven years of secondary schooling. In 1970, the government chose to continue these parallel systems with some qualitative reforms of rural education. This was the second policy cycle (UNESCO, 1995). UNESCO and the World Bank evaluated the policy of rural non-formal education in Burkina Faso and found that:

1. Rural education had no influence on the country's

- economy;
2. There was still poor agriculture activity; and
3. Achievement levels were poor and primary education still suffered access.

The suggestion was to expand the primary educational sector and continue with the rural non-formal education (UNESCO, 1995). Two French educators also observed that the French colonial academic pattern of schooling was inappropriate to the kind of development necessary in most African countries, which were primarily based on agricultural economy (UNESCO, 1995).

Therefore, they carried a survey to collect data on the country's population, manpower and the state of the economy. They made intellectual guesses which recorded scanty data. Their findings were that there were high levels of illiteracy in the rural areas and that educational services were inadequate. They then proposed education policy that provides access to all, introduced streaming after third year of primary education and also suggested the alternative system of education—a shorter programme of study with more relevant curriculum (UNESCO, 1995).

Similarly, developed countries took systematic steps, over a long period, to provide and achieve high access basic education for their citizenry. For instance, after the American Revolution, from April 19, 1775 to September 3, 1783, the American government established and introduced free public schools for all, in an attempt to increase access to education.

In the 19th century, it expanded access to education, thus by 1870, all states had free elementary schools. As the 20th century drew nearer, states started passing laws to make schooling compulsory, in order to improve access. As a result, by 1910, 72 percent of children attended school (Illinois State Board of Education, 2010). At 99%, the reading literacy rate of the US population beyond the age of fifteen has, ultimately, been affected (U.S. Department of Education, 2003).

In developing countries, particularly in the Gold Coast, the First Education Ordinance of 1882 was established to promote and assist education. The aim was to train African to manage local administration at the lower level and staff the private capitalist firms owned by the Europeans.

Again, in 1908 some strides were made to better the educational system when the Europeans thought of establishing industrial, agricultural and technical training institutions. The country set up a committee in 2002 which settled on a philosophy of education that sought to create a well-balanced all-round people with adequate knowledge, skills and values, attitude and aptitude to become functional and productive citizens. Some efforts were made to ensure that students become enterprising and develop capacities to respond to the demand of a fast-changing world driven by science and technology.

Additionally, since 2001, several states in the US have published policy statements encouraging the expansion

of international education in public schools, particularly world-language study and student and teacher exchange programmes. As in Ohio, the Indiana Department of Education (IDOE) is leading initiatives in international education, a project that has been on the IDOE's agenda for over 30 years. Recent efforts have included: encouraging the expansion of course offerings in the state's schools, increasing the depth and breadth of world languages taught in Indiana schools, and increasing cultural exchange opportunities for Indiana schools. Some of the early efforts included: indefinite approval for foreign exchange programmes for countries in good standing with the US Department of State in 1979, Fulbright-Hays study tours for teachers to other countries, and the establishment of memorandums of understanding with France, Taiwan, and Spain that have resulted in greater interaction between residents of Indiana and educators from these countries (Christopher and Whitehead, 2009).

The Dzobo report of 1973 in Ghana recommended the basic and Senior Secondary School concept. New structure educational curriculum was thus provided in the Ghana Education Service decree of 1974. As a result, the Ghana Commission Report on basic and secondary education 1987/1988 was written. The Review of Educational Reforms in Ghana in 2002 and White Paper Reforms on Education reforms reviewed in 2004 were also established to guide several dimensions of the educational practise in Ghana. In 2007/2008, educational reforms by the Ministry of Education and the Ministry of Science and Sports led to structural changes that affected the content, delivery and methods of education in the country. These included: a basic educational programme for Ghanaian language, an English programme for kindergarten and lower primary literacy, mathematics, creative arts and problem- solving. The three-year Junior High School and four-year Senior High School systems were also included (Kwapong, 2010).

Developed countries have introduced various curriculum reforms to improve the quality of education in their countries. A typical case is the UK government's introduction of two significant national curriculum policies, in the 1980s, to tackle the problem of poor literacy and numeracy, as well as to address general concerns about poor standards. Firstly, in the late 1980s, a standardised national curriculum was introduced for pupils aged between seven and sixteen. The purpose of the national curriculum was to raise standards by ensuring that all students study a prescribed set of subjects up to a minimum level until the age of sixteen. The second policy reform, in 1998, was the introduction of the National Literacy and Numeracy Strategies. These strategies involved all primary schools allocating part of the daily curriculum to Literacy and Numeracy hours, with the specific aim of developing pupils' basic skills. The content of these daily Literacy and Numeracy lessons, and indeed how they should be taught, was tightly prescribed

by the central government. Students' understanding of the curriculum also began to be tested, via the use of national tests taken at ages seven, eleven, fourteen and sixteen (or Key Stage 1, 2, 3 and 4) (Machin and Vignoles, 2006).

In 1975, the government of Burkina Faso passed an educational bill which was basically a programme policy to address how and where rural education should be provided qualitatively, but not for an expansion of the existing system. However, in the 1980s, international donors undertook a major assessment of the merits of rural non-formal education to refine its quality (UNESCO, 1995). In improving the quality of education, developed countries introduce very compelling quality policies such as the standards policies introduced in the US in the 1990s.

Beginning in 1992, the standard policies established content standards for student knowledge, performance standards regarding levels of student mastery, and opportunity-to-learn standards governing conditions of learning (UNESCO, 1995). States reinforced the new standards through equally new performance accountability systems composed variously of public reporting requirements and performance tests, some tied to school rewards, sanctions, or state interventions to assist failing schools. Standards-based reforms adopted a systemic perspective on education change, pursuing greater coherence across the gamut of learning goals, curriculum changes, professional development, accountability assessment, and governance arrangements (Jacob, 2013).

METHODOLOGY

Data was collected through textual analysis of some policy documents and review of an integrated literature. An integrated literature review is a form of research that 'reviews, critiques, and synthesises representative literature on a topic in an integrated way such that new frameworks and perspectives on the topic are generated' (Torraco, 2005).

Relevant articles in peer reviewed Journals, textbooks and other academic papers were accessed and reviewed. The type of research is a Mini Comparative study with four countries as reference points. These are the UK, US, Ghana and Burkina Faso. Two countries in Africa namely: Ghana and Burkina Faso were used for the study in relation to developing countries. Ghana was chosen because that is where the researchers are based. It was also the first country to gain independence in Sub-Saharan Africa, thus issues about Ghana is worth studying. Burkina Faso was chosen because it is also in the Sub-Region of Africa and has gained the attention of the international community. For the developed countries, UK and US were chosen because they are popular examples of developed countries.

This work does not aim rigidly at pursuing historical development of educational policies in the stated countries. Rather, it is simply making efforts to outline and discuss some educational policies that are similar or different in these countries. One may argue that it does not make sense to compare the selected countries in Africa to the selected countries in the developed world because they are not on equal playing ground. That will be hasty generalisation because

we can look at the similarities and differences between the rich and the poor- what they have in common and where they differ- for knowledge purposes, and also as a means of motivation for the poor to strive for a gradual rise to becoming a developed country. Additionally, globalisation, developmental and technological advancement have hit every corner of the land, thus enabling cross fertilisation of ideas.

The research design is a comparative case study (Ragin, 1987). Ragin (1987) maintains that such methodology is suitable when researchers, as we do, want to have a grasp of 'cases because of their intrinsic value'. However, as Ragin (1987) further argue, matching such cases also allows researchers to draw limited generalisations that may be illustrative of greater trends, setting up possibilities for further research. Since the method for this research was reviewing existing data in the related areas, textual analysis was used as the method for analysis of data. Explications and interpretations of texts, constructs and statements within relevant literature were engaged in.

SUMMARY OF FINDINGS

In the developed countries, policies on financial support to basic and second cycle schools are tied to improved performance of students. Additionally, institutions are held responsible for failing to meet the demand of a standardized test. These are not issues emphasized in Africa countries. While in some developed countries basic and secondary education are free and compulsory, in developing countries only basic education is free and compulsory. Moreover, the length of compulsory education in developed countries is longer than those in developing countries.

The investment in compulsory education of developed countries is higher than that in developing countries due to differences in GDP levels. Expenditure on education is high in developed countries and low in developing countries. Africa' educational reforms and policies have been very much donor-driven and it is normally sponsored by the World Bank and the International Monetary Fund with associated unbearable strings. Developing countries are able to finance their own educational budgets.

Developing countries focus on centralised educational policy and administration while developed countries decentralise their education system. Educational policies in the developing countries are less responsive to the demand of the environment compared to the developed countries. In terms of similarities, developed and developing countries adopt systematic steps, over a long spectrum to provide and achieve high access elementary education for their citizenry. Developed and developing countries have introduced various curriculum reforms to augment access and quality of education in their countries. Both developed and developing countries have workable and enduring policy on special education.

DISCUSSIONS

Against the backdrop of the need to promote equitable

access to education for all, at all levels, Burkina Faso and Ghana's educational policies have focused on making education equitably distributed across regions, sex, income and religion.

The Ministry of Education plays the role to provide relevant education to all Ghanaians, at all levels, to enable them acquire skills that will assist them to develop their potential, be productive, facilitate poverty reduction and promote socio-economic growth and national development (Kwapong, 2010).

However, practically, there have been several challenges confronting the full realisation of the goals of this policy. For example, Local policies are formulated to augment access and quality of basic and secondary education, yet several children are still at home not enrolled. The dropout rates are also very high.

Among the crippling factors confronting the implementation of the capitation grant policy in Ghana is the delay in the release of the grant, misuse of funds by some heads of institutions, increased workload on implementers, lack of transparency and poor book-keeping skills and knowledge in financial accounting. The extent to which capitation grants are unfairly allocated is also a problem. In building the financing policies in schools, accountability, in terms of judicious use of the funds, and performance of students through standardised tests found in the No Child Left Behind (NCLB) educational policy of the United States, must be emulated by the developing countries.

The banking education practice in Africa, adopts instructional methods which are teacher-centred at the expense of learner participation. As a result, class notes are soon forgotten after examinations, since learning is by rote memory (Mattei, 1996). All these outcomes are based on the prevailing educational policies derived from the colonial masters. The banking education practise must be relegated to the background in order to adopt learner- centred pedagogy adopted by the developed countries. This enhances creativity and innovation and enables personal and social knowledge construction through discussions and discourses among learners.

Developing countries should learn from developed countries to build accountability strategies into their policy implementation programmes, in order to monitor and detect implementing institutions and agencies who are deviating from the set objectives so that appropriate sanctions can be applied to them. The accountability strategies, if well incorporated into policy implementation programmes, will increase the commitment levels of policy implementers, which will consequently lead to successful implementation of educational policies and programmes to achieve the desired benefits of those policies.

To ensure quality in the education sector, there should be regular checks on heads of institutions. In addition, the government needs to increase the grant, and set up adult teams to put administrators on their toes so that they are well monitored to produce required results.

The researchers contend that while the educational policy systems of the four countries are increasingly divergent, there are still many similarities. This is borne out in the evidence on educational outcomes, which show many similarities between the four countries. Due to these similarities, the positive impacts of many of the policies and programmes adopted in England and US may have relevance for Ghana and Burkina Faso.

Evidence is found that increasing school resources improves results, and also, that more targeted spending benefits pupils from disadvantaged backgrounds to have access to education. Policies shape educational situations, but there are also policies that are divergent from reality, an observation which is not helpful and therefore must be corrected.

CONCLUSION AND RECOMMENDATIONS

Education policies should be formulated on serious diagnosis on the sector itself and contextual analysis of economic, political, socio-cultural and educational situations; including an assessment of relevant interest groups, the rationale and roles of educational change and the process through which trade-offs are accomplished. Popular support is also important to enable education policies work. Sensitivity analysis proving the various scenarios of policy options must also be constructed and the best option pursued.

Educational policy must enhance personal learning and thinking skills (PLTS), together with functional English, mathematics and ICT. These cover the areas of competence that are most demanded by employers. Integrating these skills into the curriculum and qualifications will enable learners to be more employable as well as provide them the opportunity for further learning. PLTS are: team working, independent enquiry, self-management, reflective learning, effective participation and creative thinking (DCSF, 2009).

Governments of developed countries ensure regular and prompt release of funds to schools for their efficient and effective running. This must be emulated by the developing countries where government subventions delay to the extreme, crippling activities as a result. Educational policies in Africa need to be decentralised while implementation must be monitored rigidly and enforced by a superior body. This will help translate policy into practise in a timely manner. It is also expedient that Africa's educational policy be practically responsive to the demand of the society.

LIMITATIONS

This is purely literature review research. The sample cases are also small. Future studies must involve some empirical perspectives through interviews with educationists and educational policy makers. The sample

size must increase by factoring more developed and developing countries. Nevertheless, we can boldly state that this information contains a lot of facts that could be reliably deployed for policy development and implementation by educational planners, policy makers and the governments of Ghana and Burkina Faso. Those attractive policies in the developed countries could be employed if found suitable in African context.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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Full Length Research Paper

Comparison of movement notation (Laban) and traditional methodological learning success in teaching folk dances

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In this research, Movement Notation (Laban) and Traditional Method in Folk dance Teaching were compared in terms of learning success. Movement notation group (n = 14) and Traditional group (n = 14) consisting of students from the S.U. State Conservatory Turkish Folk Dance Department were formed. During the 14 week long study, the symbols of the Movement Notation (Laban) have been taught by exemplifying motifs in Turkish Folk Dances. Groups were formed by neutral assignment and "post-test control group model" was used. In the analysis of the data, parametric analysis and descriptive statistics were applied in solving sub problems. The learning achievements of the students in the Movement Notation (Laban) and the traditional group were compared both in terms of individual and group averages. It was determined that both the individual and group learning success of the Movement Notation Group (Laban) in the direction of the findings were higher than in the Traditional Learning Group (P<0.05).

Key words: Turkish folk dances, movement notation (Laban), traditional learning method, learning achievement.

INTRODUCTION

Learning is the change that occurs in the behaviors of the individual as a result of his/her ordeal that he or she experiences as a result of life experiences. In general, all activities arranged in order to realize learning in people are called teaching (Sönmez, 1991). Eroğlu (1995, p. 22) refers to the Turkish Folk Dances as "teaching the culture that reflects the cultural value of the society it belongs to, without musical instruments or with a musical

accompaniment, which is a tragic and culturally related to an event, a joyful, Taking tempo from the music they perform by singing folk songs".

Şınasi Ünal defines folk dances as "teaching and learning activities that occur between teachers and students" and classifies folk dances as classical and systematic methods and collects the systematic method in six sub-titles (Ünal, 2007, pp. 18-21). Physical

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Education Classical (traditional) method called "Demonstration" in Sports Science is expressed as "the motions of the tutors are modeled on their students and the students are asked to repeat these movements" (Çakır 2009, p. 87).

"Many authors stress the importance of movement observation and analysis in the territory of movement education. Sweeney (1970) thinks that if the student can conceptualize and verbalize the movement, she/he also understands it. By the means of understanding the acquisition of the movement needs less rehearsal and the movement stays in memory for a longer time" (transporter Fügedi, 2003, p. 397). Cognitive teaching can be realized by using notes as if it is in music in the teaching of folk dances where the psychomotor and cognitive field is predominantly used. It is only possible with a symbol system that the concept of motion is realized at the correct value grade of cognitive field teaching. This system of symbols is named as movement Notation in the art of dance. When we look at the historical backgrounds of motion notation systems, it appears that various methods have been developed, including Egyptian hieroglyphs. "Thoinot Orchesographie" "Choregraphie ou l'Art de Decrire La Dance" "Stenochogergaphie" "Grammatik der Tnazkunst" Stepanov "Alphabet des Mouvements and Corps Humain" are some of these systems (Fügedi, 2011). "Raol Auger Le Feuillet, a pupil of Beauchamp and likewise a member of the Academy, invented the first modern dance notation since the fifteenth century: he was the predecessors of Fisher-Klamt, Laban, and Neumann" (Sachs, 1965, p. 395). However, by the 20th century, especially the two systems were made very common in Europe and England, and they were systematically included in their education, teaching and choreography. These are Benesh Movement Notation and Labanotation (Kinetography/Laban). The Benesh Dance Notation was created in 1955 by Joan Benesh and her husband Rudolf Benesh from Sadler's Ballet Ensemble Dance Society in England. In 1962, the system was taught by the Korean Institute of Chorology, which was established within the Royal Ballet of England (Şenel, 1990). "Laban was created in 1928 by Rudolf Van Laban in Hungary and was named by its creator," Brown (2008, p. 8), "a writing system in which all movements that can be made by the body are simply taken into account. Laban, which is not only used in dance but also in many other areas, was later named as Kinetography. "It continues to be used in fields traditionally associated with the physical body, such as dance choreography, physical therapy and drama. It has also been applied in anthropology and industrial production. It can be used for analysis and choreography of all forms of human movement" (Locke et al., 2005, p. 114).

"A main feature of Laban's notation system is his invention of using the vertical staff; music notation and previous notation systems before him were set horizontally across the page. The vertical placement has

a strong advantage in that it represents the human body from the dancer's point of view. Laban developed new ideas and encouraged future developments of his notation system to be made by dancers and movement analysts" (Lack, 2012, p. 10).

Traditional methods are easier and preferable because they are based on cultural codes and visual memory. The Laban system, however, allows you to learn all kinds of sections in detail. Like visual aids used in teaching mathematics and other subjects, Laban provides a similar visual method for dance and physical education. As Laban system provides a teaching based on cognitive bases, it is more persistent. It provides a similar record of the performance performed on persons in dance (e.g. video or dance) (Guest, 2005). The embodiment of the chapter in mind helps to make it easier to understand.

At the same time, this system is thought to contribute to student coding, analysis and synthesis. Royce (2002, p. 68) emphasized Laban's importance by saying: "Laban records all the movement the body parts can make so it gives the researcher a chance to make ethical observations".

Notation systems used in dance art as well as in music art both for recording movements and for analyzing studies. As Guest (2005, p. 5) stated, "Labanotation serves as much as music notation for dance art serves music art. Partition is an important part of the work of the composer, teacher, student and of course the dancer". Undoubtedly, in addition to many studies with cultural features such as the Movement Notation (Laban), many of the techniques of the movement culture will play a crucial role in keeping the original and registering it, in spite of the long time it takes to learn it. It also means the use of a common language in the world. In the field of dance education there are no any teaching materials which provide cognitive learning. So we aim to bring in the field a new method to apply effective learning. In this study, the learning success of the Motion Notation (Laban) is compared with the Traditional Learning Method.

METHODS

In this research; Traditional teaching method "and Motion Notation (Laban) were examined in terms of learning success. The study was conducted with students who did not know anything about Harmandalı Dance and Motion Notation (Laban)¹.

In the first part of the 14-week study period, the symbols for the Laban group were introduced, while the reading was taught; the motifs of our dances have been reinforced by dictation and deciphering. I was taught to traditional group by making available in our dances and taught by practicing departmental structures. The trainings were also reinforced by assignments and intermediate levels of learning were determined. After 7 weeks of basic training, all teaching and listening sessions were recorded with the camera. There were 14 students in each group, 8 female (57.1%), 6 male

¹ Harmandalı Dance is a kind of Turkish Traditional Dance which plays in especially Aegean Region. View Ali Haydar Avcı, Zeybeklik ve Zeybeklik Tarihi, E yayıncılık, 2004.

Table 1. Score ranges used in interpreting the score averages.

Options	Weighted score	Score range
Very Weak	1	1.00- 1.79
Weak	2	1.80- 2.59
Average	3	2.60- 3.39
Good	4	3.40- 4.19
Very Good	5	4.20- 5.00

(42.9%) in the Traditional group; and 6 female (42.9%) and 8 male (57.1%) in the Laban group.

In the study, "final test control group model" was used as the real test models (Karasar, 2000, p. 98). The Harmandalı Dance was chosen because it contained clearer expressions in terms of parts, the metronome was heavier, and its measurement and evaluation were decisive.

The level of learning and implementation success of each group was made by a referee delegation of four people who served as referees in the Turkish Folk Dance Federation and were qualified in the field. At the beginning of the interview sessions, the Movement Notation (Laban) was briefly introduced to the referees, the aim of the study was mentioned, and the evaluation form was introduced. In the Evaluation Form, the Harmandalı Dance was divided into four sections; each section was assigned a number. The sections are mentioned by numbers 1, 2, 3 and 4. Each section was formed in nine stages according to the time of the game itself. Each box was preceded by a section description, followed by a rating number of up to five. For each section correctly done, referees were asked to score objectively according to skill level.

The normality test was performed to determine the statistical technique to be used in the analysis of the data. The "Shapiro-Wilk" normality test was applied because the number of data in the survey was 28. In the analysis made, the "Sig." Value of the "Shapiro-Wilk" test was higher than $0.09 > 0.05$, it was found that the data are in normal distribution. Therefore, parametric analyzes were used in the research.

In the analysis of the sub-problems, t-test was applied from the descriptive statistics to the arithmetic average and standard deviation, from the point average to the non-grouped sample (independent groups) at 0.05 significance level and to the sample (dependent groups). Interpretation of the mean scores obtained was based on the weighted scores and the range of points in Table 1. All statistical operations were done with SPSS 20.00 package program.

Study group

This study was conducted with students who are enrolled in the first and second grade of the Turkish Folk Dance Department of the State Conservatory of the University of Sakarya between 18-22 age groups (Table 2). They had similar levels of perception.

Analysis of data

The data obtained from the study were transferred to the computer and analyzed by using SPSS 20.00 package program.

Groups' information was gathered with "Information form". A four-person referee delegation consisting of persons who have served as referees in the Turkish Folk Dance Federation and graduated from the Turkish Folk Dances has been formed in order to conduct individual and team assessments of both methods. First of all, the movement note system (Laban) system was introduced, and then

Table 2. Study group.

Groups	Gender	F	%
Motion notation (Laban)	Female	8	57.1
	Male	6	42.9
	Total	14	100.0
Traditional	Female	6	42.9
	Male	8	57.1
	Total	14	100.0

the evaluation form was introduced. In the evaluation form, the Harmandalı Dance was divided into four sections, each consisting of eighteen parts. For section identification, grading numbers and boxes of 1 to 5 were placed. The judges were asked to score according to skill (accuracy) level for each section. Each of the quartets displayed by a player rated fourteen referees in eighteen pieces, and the average of these scores constituted the score for that section.

The "Shapiro-Wilk" normality test was applied because the number of data in the survey was 28. In the analysis made, the "Sig." Value of the "Shapiro-Wilk" test was higher than $0.09 > 0.05$, it was found that the data are in normal distribution. Therefore, parametric analyzes were used in the study. In the analysis of the sub-problems, t-test was applied from the descriptive statistics to the arithmetic average and standard deviation, from the point average to the non-grouped sample (independent groups) at 0.05 significance level and to the sample (dependent groups).

FINDINGS AND INTERPRETATION

Findings of the study were handled as 1) Average of individual learning achievements 2) Evaluation of team scores.

Laban and Traditional Group members' learning achievement levels

Level of individual learning success of Laban Group

Table 3 showed individual learning success average scores of Laban group, Section I $\bar{X}=4.57$, Section II $\bar{X}=4.53$, III. $\bar{X}=4.54$ IV. $\bar{X}=4.37$ at the very good level. The average of four sections is at the level of very good with $\bar{X}=4.50$. The highest success score of the individuals according to their score belonging to student number 11 with $\bar{X}=4.68$; whereas the lowest score average belongs to student number 1 with $\bar{X}=4.34$.

Level of individual learning success of Traditional Group

Table 4 revealed individual learning success average

Table 3. Level of individual learning success of Laban Group.

B	B.i.	Movement notation (Laban) individual learning success levels														
		L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13	L14	G.O.
I.B.	X	4.48	4.4	4.59	4.29	4.65	4.59	4.68	4.43	4.66	4.58	4.84	4.7	4.68	4.38	4.57
	ss	0.5	0.54	0.49	0.77	0.47	0.57	0.46	0.74	0.53	0.57	0.36	0.45	0.46	0.7	0.31
II.B.	X	4.22	4.68	4.38	4.34	4.44	4.7	4.79	4.51	4.66	4.3	4.65	4.52	4.73	4.47	4.53
	ss	0.82	0.49	0.76	0.85	0.57	0.45	0.4	0.69	0.6	0.84	0.5	0.6	0.47	0.75	0.32
III.B.	X	4.3	4.7	4.4	4.7	4.7	4.5	4.4	4.5	4.4	4.5	4.6	4.6	4.5	4.6	4.54
	ss	0.64	0.55	0.55	0.46	0.62	0.6	0.68	0.64	0.6	0.67	0.6	0.5	0.6	0.6	0.38
IV.B.	X	4.34	4.26	3.98	4.44	4.38	4.34	4.58	4.41	4.45	4.38	4.6	4.4	4.3	4.3	4.37
	ss	0.58	0.71	0.95	0.66	0.7	0.73	0.59	0.7	0.73	0.76	0.5	0.6	0.8	0.8	0.51
Total	X	4.34	4.5	4.35	4.44	4.53	4.53	4.61	4.46	4.55	4.44	4.7	4.6	4.6	4.4	4.5
	ss	0.65	0.6	0.74	0.72	0.61	0.61	0.56	0.69	0.62	0.72	0.5	0.6	0.6	0.7	0.39

Table 4. Level of individual learning success of Traditional Group.

B		Traditional individual learning success levels														
		G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12	G13	G14	G.O.
I.B.	x	4.11	4.16	4.09	3.93	4.34	4.27	4.38	4.04	4.18	4.05	4.36	4.3	4.31	4.34	4.2
	ss	0.64	0.67	0.69	0.67	0.63	0.71	0.57	0.61	0.65	0.74	0.67	0.61	0.66	0.71	0.45
II.B.	x	3.81	4.36	3.98	3.95	4.25	4.38	4.5	4	4.43	3.84	4.13	4.25	4.52	4.45	4.2
	ss	0.79	0.69	0.75	0.77	0.57	0.64	0.58	0.85	0.64	0.74	0.69	0.68	0.6	0.69	0.43
III.B.	x	4	4.41	4.08	4.55	4.47	4.3	4.33	4.41	4.29	4.15	4.44	4.63	4.34	4.3	4.34
	ss	0.67	0.62	0.68	0.5	0.73	0.68	0.71	0.49	0.7	0.68	0.72	0.48	0.71	0.68	0.42
IV.B.	x	4.01	4.4	3.76	4.22	4.27	4.37	4.36	4.11	4.38	4.04	4.08	4.55	4.48	4.45	4.25
	ss	0.89	0.66	0.83	0.73	0.65	0.59	0.82	0.86	0.68	0.77	0.88	0.57	0.64	0.6	0.5
Total	x	3.98	4.33	3.98	4.16	4.33	4.33	4.39	4.14	4.32	4.02	4.25	4.43	4.42	4.39	4.25
	ss	0.76	0.66	0.75	0.72	0.65	0.65	0.68	0.74	0.67	0.74	0.76	0.61	0.66	0.67	0.45

scores of Traditional group, Sections I and II $\bar{X}=4.20$; Section III $\bar{X}=4.34$; For Section 4, the group score average is $\bar{X}=4.25$. Sections I and II are in the lower limit of very good level, while Sections III and IV are at very good level. In individual learning success, student number 1 has the highest level with $\bar{X}=4.43$ and student number 3 has the lowest level with $\bar{X}=3.98$.

According to the results of the unrelated sample t test for the comparisons between the Laban group and the traditional groups in the divisional care that make up the harmonious game (Table 5), when the individual learning scores are compared for Sections; Section I ($t_{(26)}=6.457$,

$p<0.05$), Section II ($t_{(26)}=3.997$, $p<0.05$) and Section III ($t_{(26)}=3.475$, $p<0.05$) results were significant differences in favor of Laban group in all three sections. No significant difference was seen between Laban and Traditional method for the learning of Section IV ($t_{(26)}=1.645$, $p>0.05$). It is understood that the individual learning success is a significant difference in favor of the Laban group as a whole ($t(26) = 4.950$, $p<0.05$) in the entire game as a whole.

Laban and Traditional Groups' team learning achievement levels

Section I, score average of Laban group $\bar{X}=4.91$, score

Table 5. Comparison of individual learning success of Laban and Traditional Groups t-test.

Sections	Groups	N	X	ss	sd	t	p
Section I	Laban	14	4.57	0.15	26	6.457	0.00*
	Traditional	14	4.2	0.14			
Section II	Laban	14	4.53	0.17	26	3.997	0.00*
	Traditional	14	4.2	0.24			
Section III	Laban	14	4.53	0.11	26	3.475	0.00*
	Traditional	14	4.34	0.17			
Section IV	Laban	14	4.37	0.14	26	1.645	0.56
	Traditional	14	4.25	0.21			
General	Laban	14	4.5	0.09	26	4.95	0.00*
	Traditional	14	4.25	0.16			

*p<0.05.

Table 6. Laban and Traditional Groups' team learning achievement levels.

Groups	H	Harmandalı Game									
		I.B.		II.B.		III. B.		IV. B.		Total	
		X	ss	X	ss	X	ss	X	ss	X	ss
Laban	4	4.91	0.05	4.65	0.05	4.77	0.09	4.69	0.22	4.76	0.08
Traditional	4	4.59	0.25	4.44	0.14	4.51	0.25	4.5	0.28	4.51	0.11
Total	8	4.75	0.24	4.54	0.14	4.64	0.22	4.59	0.26	4.63	0.16

average of Traditional group $\bar{X}=4.59$; Section II, score average of Laban group $\bar{X}=4.65$, score average of Traditional group $\bar{X}=4.44$; Section III, score average of Laban group $\bar{X}=4.77$, score average of Traditional group $\bar{X}=4.51$; Section IV, score average of Laban group $\bar{X}=4.69$, score average of Traditional group $\bar{X}=4.50$; Without considering the section difference of groups, the score average of Laban group in general total ($\bar{X}=4.76$) is higher than score average of Traditional group ($\bar{X}=4.51$) (Table 6).

Team assessment independent groups between Laban and traditional method learning success t test results

According to the team assessment in Table 7, the average score of the Laban group is higher than that of the Traditional group. Section I ($t_{(6)}=2.46$, $p<0.05$), Section II ($t_{(6)}=2.72$, $p<0.05$), In section III; ($T(6) = 1.93$, $p<0.05$) and the general evaluation without regard to the

division ($t(6) = 3.39$, $p < 0.05$) were found to be significant in favor of the Laban group. The difference between the two methods is not significant in Section IV ($t(6) = 1.07$, $p > 0.05$), although the average score of the Laban group in the department is high.

Comparing the Laban Group's in-group learning success by gender: According to gender in the Laban group III; there was a significant difference between the female and male scores in the section for women ($t(12) = 4.136$, $p < 0.05$) (Table 8).

Comparing the Traditional Group's in-group learning success by gender: According to gender of traditional group, Section I ($t_{(12)}=1.669$, $p<0.05$), Section II ($t_{(12)}=2.741$, $p<0.05$), Section II ($t_{(12)}=2.367$, $p<0.05$), Section IV ($t_{(12)}=3.856$, $p<0.05$). In general, significant differences in favor of males was found at the level ($t_{(12)}=3.767$, $p<0.05$) (Table 9).

DISCUSSION

In the evaluation of the Teams I, II and III, Significant differences is found in the sections in favor of Laban

Table 7. Laban and Traditional Groups comparison of team evaluation t-test results.

Section	Groups	H	X	ss	sd	t	P
Section I	Laban	4	4.91	0.05	6	2.46	0.02*
	Traditional	4	4.59	0.25			
Section II	Laban	4	4.65	0.05	6	2.72	0.03*
	Traditional	4	4.44	0.14			
Section III	Laban	4	4.77	0.09	6	1.93	0.04*
	Traditional	4	4.51	0.25			
Section IV	Laban	4	4.69	0.22	6	1.07	0.16
	Traditional	4	4.5	0.28			
General	Laban	4	4.76	0.08	6	3.39	0.02*
	Traditional	4	4.51	0.11			

*p<0.05.

Table 8. Individual achievement levels of the Laban Group according to gender t test.

Section	Gender	N	X	ss	sd	T	P
Section I	Female	8	4.54	0.18	12	-0.812	0.21
	Male	6	4.61	0.08			
Section II	Female	8	4.54	0.12	12	0.269	0.39
	Male	6	4.51	0.24			
Section III	Female	8	4.6	0.07	12	4.136	0.00*
	Male	6	4.43	0.08			
Section IV	Female	8	4.4	0.1	12	0.699	0.25
	Male	6	4.33	0.2			
General	Female	8	4.52	0.08	12	0.859	0.21
	Male	6	4.47	0.11			

*p<0.05.

Table 9. Individual achievement levels of the Traditional Group according to gender t test.

Section	Gender	N	X	Ss	sd	T	P
Section I	Female	6	4.14	0.11	12	-1.669	0.04*
	Male	8	4.26	0.14			
Section II	Female	6	4.03	0.22	12	-2.741	0.01*
	Male	8	4.33	0.18			
Section II	Female	6	4.23	0.18	12	-2.367	0.02*
	Male	8	4.42	0.12			
Section IV	Female	6	4.08	0.18	12	3.856	0.00*
	Male	8	4.39	0.11			
General	Female	6	4.12	0.14	12	3.767	0.00*
	Male	8	4.35	0.08			

*p<0.05.

method ($P < 0.05$). However, for section IV, the difference between the two methods is not significant. From here, it can be interpreted that the learners can read through a single note with the Laban Method, the nuances of the parts can reach the repetitive student with the same content and quality, and the teacher's dependency for the repetition is removed. Due to the displacement nature of the division, it has been concluded that the equilibrium in shifting affects both groups in a similar way. As can be seen in the meaningful differences that have been described, literacy and accessibility to the same content and quality of repetition demonstrate that Laban can provide an inspection and discipline in itself according to the traditional method. From here it can be reached as a result of supporting the perceptive values of the learners.

In terms of gender in the learners with the Laban method, in section III, there is a learning success in favor of the women and in the part of the traditional method learning in favor of the men in all the departments. It is important that the difference in learning method in both learning methods is not understood from where it originated but the difference is less in the Laban group so that the difference of the method is minimized.

In this study comparing the individual and group learning achievements of the Laban and Traditional teaching methods, Harmandalı Dance consisting of four parts was used. There was a significant difference between the groups in favor of Laban ($P < 0.05$), as averages of individual learning achievement, between the sections and the whole of the harmonized game. From this, it can be said that the method of lane motion notation teaching has more accurate and more adequate learning in terms of learners according to the traditional teaching method. This result also means the ease of teaching at the same time. In fact, although there are some forms of movement between the sections and the characters, the fact that there is a significant difference in all the parts is another statement that the Laban method performs the correct learning. With a similar study, Fügedi (2003, p. 406) revealed that, "dance notation was proved to be an established tool for dance research and dance education in understanding and analyzing movement. This theorem is especially valid in cases where -the structure of dance is amorphous - the units of movement sequences differ from that of the accompanying music - the tempo of the dance is high".

Laban is a tool that removes teacher dependency, especially in the teaching of folk dances and all kinds of movements. A student can see and repeat a movement in the same way as the student needs it.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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Full Length Research Paper

Preservice music teachers` perception of their music teachers

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This research examines preservice music teachers` perception of their music teachers during their schooling. The data for the research were obtained by asking 135 preservice music teachers to fill in the blanks in the sentence ‘my music teacher was like a..., because...’ A content analysis of the data resulted in 80 different metaphors. These metaphors were grouped into eight different categories. The participants` perceptions were mainly focused on four roles and characteristics of their music teachers namely, ‘guiding/supportive,’ ‘expert/authority,’ ‘kind/supportive,’ and ‘inefficacious/with communication problems’. The results showed that, participants’ music teachers had an important role in terms of providing them guidance, and being kind and supportive. However, participants were taught in more traditional way of teaching where teachers are seen as transmitter of knowledge and authoritarian. Some negative comments about their music teachers were given which needs further research.

Key words: Music teacher, preservice music teachers, perceptions, metaphor.

INTRODUCTION

In one`s daily lives, a constant communication with other people is maintained, by talking, reading or writing. The main purpose of this daily communication is to express one`s self in the best way possible. To achieve this, examples and images are used to explain or talk about a situation, an object, or a concept. According to Palmquist (2001), a metaphor is a construct of figurative expression built through comparison and contrast between two objects or concepts, as well as the transfer of the experience of one of the two things to the other.

Lakoff and Johnson (1999) claimed that metaphors correspond to neural mapping in the brain, and reflect a

way to organise human experiences by creating images. He asserted that the abstract metaphorical approach to learning allows learners to grasp complex concepts in the context of their existing practical repertoire. It is believed that, learners can interpret their practical repertoire through metaphors, and thus influencing the way they act.

Schechter and Firuz (2015) mentioned different groups of studies, which were most of them in education, focused on exposing the implicit or the explicit dimensions of participants’ interpretations of a certain situation, either by analysing the metaphors found in the

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texts or approaching the participants with a list of existing metaphors. Schmitt (2005) considers metaphor as an important data collection tool in qualitative research. Metaphors present a holistic framework of perception because they provide an understanding of experience related to the subject of the metaphor.

Geçit and Gençer (2011) pointed out that metaphors are used to enrich the teaching and educational environment, and employed in formal teaching with the purpose of explaining complex concepts and phenomena. Particularly, concept of 'music' was one of the interest research area among Turkish music education researchers and metaphors were used as an instrument in data collection. Examples of these studies were Koca (2012) research on teachers' metaphorical perceptions of 'music' as a concept; Umuzdaş and Umuzdaş (2013) students' perception of 'music classes' through metaphors; Babacan (2014) Anatolian fine arts high school students' perceptions of 'music' as a concept; Uygun (2015) future teachers' perceptions of 'Turkish folk and classical Turkish art music'; Sözbir and Çakmak (2015) early year preservice teachers' perception of the concept of 'music'; and Yazıcı (2015) primary class preservice teachers' perceptions of 'music classes'.

Researchers and teacher educators have shown increasing interest in metaphor research as a means to better understand how teachers conceptualize their views about school, teacher, principle, curriculum and teaching. There is a growing body of international literature that supports the study and use of teacher's metaphorical images in understanding how they conceptualize their work and themselves in that work. A number of the studies in this area concern the concept of 'being a teacher' in general (Oxford et al., 1998; Ocağ and Gündüz, 2006; Saban et al., 2006; Zhao, et al., 2009); whereas others are related to branch teachers (Nikitina and Furuoka, 2008; Oğuz, 2009; Ünal and Ünal, 2010; Afacan, 2011).

Meanwhile, Thompson and Campbell (2003) investigated preservice music teachers' representations of themselves as teachers and their relationships to conceptions of practice. They gathered information about students' personal teaching metaphors through drawn images and written descriptions. They suggested three underlying metaphors regarding music education students' representations. These were; 'production', 'growth' and 'travel'. Images of teaching built on 'production' metaphors view the teacher as a transmitter of knowledge. Teachers were seen as experts who employ planned specifications for achieving predetermined ends. 'Production' metaphors envisioned teaching as authoritarian and authority based. Images of teaching built on 'production' metaphors viewed the teacher as one who was constantly working on personal growth. Images associated with facilitator, collaborator and mentor. Lastly, 'travel' metaphors characterised the teachers as guide where ideas connected with the roles of leaders, directors, master-apprentice type of relations.

Similarly, the latest study with Turkish preservice teachers indicated that most preservice secondary school teachers adopted the transmissive perception, which consider teachers as a source of knowledge and students as the receiving party (Akçay, 2016).

Upon entering teacher education programs, preservice teachers bring with them a set of existing beliefs formed throughout their years as students in schools; these beliefs can temper their experiences in teacher education coursework (Campbell, 1999; Schmidt, 2012), and also result in the influence of teacher education being 'washed out' (Zeichner and Tabachnick, 1981). Richardson (1996) indicates that the combination of personal experience, previous schooling, and student teaching were more influential in building conceptions of teaching than the teacher education programs.

Mahlios et al. (2010) showed that teacher education programs, with the exception of student teaching, have minimal effects on teachers' beliefs and practices. Previous life experiences and actual teaching experiences are the two most potent influences on beliefs about teaching, children, and schooling. Especially the study on preservice music teachers' perceptions of their own music teachers is considered important in understanding their previous experiences with music teaching. These experiences believed to have later influence their professional growth or the correction of possible false learning (Oğuz, 2009; Mahlios and Maxson, 1998). Educators of preservice music teachers need to develop alternative mechanisms to understand the preservice music teachers' values, beliefs, and perceptions of teaching and learning. The role of these mechanisms is to allow the development of metaphorical images. Metaphors mentioned are powerful tools to retrieve preservice music teachers perceptions and experiences on teaching and learning processes. In this way, metaphors can be used more actively in training programs for music students

In this study, metaphors were used as an instrument for inferring and understanding preservice music teachers' perceptions of their music teachers, whom they have formerly experienced. It is important to ascertain on which kind of roles these perceptions are concentrated, as they might influence preservice music teachers' future behaviour as a teacher. Within this framework, this study answers the following questions:

1. Which metaphors are used by preservice music teachers in explaining their previous music teachers?
2. Which conceptual categories can be formed according to the common aspects of metaphors related to previous music teachers?
3. On which roles or characters of the music teachers do these metaphors concentrate?

METHODOLOGY

Quantitative studies investigate individuals' conceptions through

epistemological statements developed by educational researchers, who seek the participants' inclinations towards the concepts of statements. Meanwhile, the phenomenological qualitative research, reveals and analyses the variety of meanings and perspectives. This study was carried out using the phenomenological approach. Phenomenology describes peoples' experiences with a certain phenomenon and the meaning of these experiences to them. This approach helps to understand how the participants make meaning of their experiences related to phenomena and events, and how they communicate (that is, what kind of words, concepts, or phrases they use to share) these meanings with others (Patton, 2002).

Study group

The participants of the study included 135 preservice music teachers enrolled in the Fine Arts Music Education Program (grades 1 to 4) at the Ahmet Keleşoğlu Education Faculty, Necmettin Erbakan University, in the fall of the 2015 to 2016 academic year. The participants comprised of 32 first-year, 39 second-year, 34 third-year and 40 fourth-year students. The students' age ranged from 17 to 32, with mean age at 22.5. As regards the participants' high school background before entering the music education program, 102 graduated from fine arts high school, 9 from regular high schools, 7 from three other types of high schools, and six from Anatolian high schools.

Data collection

In previous studies, the participants were asked to complete open-ended sentences (for example, 'the school is like a..., because...'). In this study, the participants were asked to fill in the blanks in the sentence 'my music teacher was like..., because...' to determine their perceptions of their previous music teachers. The students were given a paper, with this sentence written on it. They were asked to concentrate on one metaphor and then write down their thoughts within a 20 min period. Using the word 'like' was used to refer to the connection between the metaphor and the subject of the metaphor, whereas the word 'because' was utilised to provide the students with the opportunity to justify the metaphor that they have used (Saban, 2009).

Analysis and interpretation of the data

The data collected in the research were analysed using content analysis to obtain the concepts and relations that can explain meaningfully the collected data. Content analysis requires an in-depth analysis of the data collected, and enables to reveal themes and dimensions in this study that were not apparent or known before. The process of content analysis could be summarised as bringing together similar data around certain concepts or themes, and then organise and interpret them (Yıldırım and Şimşek, 2008). When analysing the metaphors written down by preservice music teacher, the steps of analysis included:

1. Naming,
2. Organising/eliminating,
3. Category development,
4. Ensuring reliability and validity, and
5. Transferring the data into digital media (Saban, 2004, 2008, 2009).

Upon completing the collection of data forms, they were organised and given a number. Next, numbered forms were transferred into a computer digital media. At this stage, a list of the metaphors used

by the students was created, and metaphors were checked whether they were expressed in a certain way. In addition, the following forms were eliminated:

1. Those with a metaphor but without an explanation,
2. Those with an explanation but without a definite metaphor, and
3. Those with a metaphor and an explanation, but without a clear connection between the two.

Based on these criteria, forms filled out by 22 students were excluded in the analysis. At the next stage a table was created; the metaphors were listed alphabetically; and the frequency values were measured. Subsequently, metaphors used by 113 students were analysed in terms of their common aspects. By checking the relationship between the metaphors and their explanations, categories were created for the metaphors.

Validity and reliability

To ensure the validity and reliability of this study, two main processes were followed. Firstly, to obtain internal validity, the data analysis process has been explained in detail, and in the findings, all the data obtained were presented in qualitative and quantitative formats. In ensuring the transparency of the procedures during research, other researchers were allowed to repeat the study in the same way. To ensure internal reliability, with the help of two experts, themes and categories were compared in order to find out the differences between the experts. Following the comparison, the number of agreements and disagreements were counted, and using the formula developed by Miles and Huberman (1994) the reliability of this study was calculated (reliability = agreement/agreement+disagreement). In qualitative research, a rate of 90% agreement between the researcher and experts was accepted as a threshold for reliability. According to the calculations, the reliability of this study was found at 93%, which means that the categories defined and the results of this study are reliable. At the same time, other measures were taken by describing the processes, whereby the metaphors were defined and analysed, and by using direct sample quotes from students' explanations of the metaphors.

RESULTS

Metaphors for music teachers

Music students produced 80 different valid metaphors when they were asked about their perception of their previous music teachers. Table 1 presents the metaphors used by this study's participants alphabetically, and the number of students that used them (frequency).

Categories of the metaphors

Metaphors used by preservice music teachers to describe their previous music teachers were grouped into eight categories (Table 2). These categories were named as 'guiding/shaping teacher', 'expert/ authority teacher', 'Kind/supportive teacher', 'valuable/versatile teacher', 'inefficacious/teacher with communication problem', 'fun teacher', 'teacher as visual image', and 'therapist

Table 1. Frequency of use of metaphors by students to describe their previous music teachers.

Order	Metaphor	Frequency
1.	Amusement park	1
2.	Angel	1
3.	Avatar	1
4.	Baglama (Turkish folk instrument)	1
5.	Bitter kernel	1
6.	Book	2
7.	Bowl	1
8.	Box	1
9.	Car	1
10.	Cat	1
11.	Cicada	1
12.	Classical state servant	1
13.	Closed box	1
14.	Clown	1
15.	Compass	2
16.	Cotton	1
17.	Crow	1
18.	Dessert	1
19.	Diamond	1
20.	Dough	1
21.	Elder brother	1
22.	Empty glass	1
23.	Family	12
24.	Father	1
25.	Flashlight	2
26.	Flower	2
27.	Friend	4
28.	Filled container	1
29.	Goddess on earth	1
30.	Gold dust	1
31.	Golden Retriever dog	1
32.	Guide	1
33.	Hand and pen	1
34.	Handgun	1
35.	Instrumental sounds	1
36.	Internet	1
37.	Iron	1
38.	Jewellery	1
39.	Kaabe	1
40.	Knife	1
41.	Leafless tree	1
42.	Life coach	1
43.	Light	3
44.	Lion	5
45.	Little lion	1
46.	Machine	1
47.	Mannequin	1
48.	Map	2
49.	Microscope	1
50.	Mirror	1

Table 1. Cont'd

51.	Model	4
52.	Muse	2
53.	Nature	2
54.	Oven	1
55.	Piano	1
56.	Pool in winter	1
57.	Princess	1
58.	Program maker	1
59.	Rainbow	2
60.	Refrigerator	1
61.	Road towards light	1
62.	Robot	1
63.	Saviour	1
64.	Scale	1
65.	Scholar	1
66.	Sieve	1
67.	Sky	1
68.	Star	1
69.	State	1
70.	Study plan	1
71.	Sun	2
72.	Table	1
73.	Therapist	1
74.	Traffic sign	1
75.	Tree	1
76.	Wall	1
77.	Water	1
78.	Witch	1
79.	Wood (log)	2
80.	World	1

teacher'.

Guiding/shaping teacher

This category includes 17 metaphors that were used by 26 participants to describe their previous music teachers. The most frequently used metaphors were 'model' (f = 4) and 'light' (f = 3). Examples of the expressions used by the participants are as follows:

'My music teacher was a model for me, because s/he served as an example; s/he directed us to this branch; s/he used to make us want it'.

'My music teacher was like light, because s/he always showed us the way'.

'My music teacher was like a map, because s/he always showed me the path and s/he guided me'.

'My music teacher was like a flashlight, because on every road we took together, s/he made us take the most

conscious steps even in the darkest and difficult situations'.

Expert/authority teacher

This category includes 18 metaphors that were used by 23 participants to describe their previous music teachers. The most frequently used metaphors were 'lion' (f = 5) and 'book' (f = 2). Examples of the statements used by the participants are as follows:

'My music teacher was like a lion, because s/he was a leader, disciplined, someone who is tense and always wants us to comply with what s/he wants'.

'My music teacher was like a book, because s/he was well-equipped, well informed, she knows everything about music'.

'My music teacher was like a filled container, because she wanted to teach everything that was necessary to

Table 2. Categories of metaphors used by students to describe their previous music teachers.

Categories	Metaphors	No. of Students	No. of Metaphors
Guiding/shaping teacher	Compass (2), map (2), guide (1), internet (1), Flashlight (2), road that leads to light (1), hand and pencil (1), road sign (1), mirror (1), saviour (1), source of inspiration (2), model (4), Baglama (1), elder brother (1), father (1), light (3), sieve (1)	26	17
Expert/authority teacher	Goddess on earth (1), book (2), scholar (1), tree (1), piano (1), microscope (1), diamond (1), filled container (1), study plan (1), program maker (1), machine (1), car (1), robot (1), steel (1), bowl (1), handgun (1), lion (5), little lion (1)	23	18
Kind/supportive teacher	Family (14), friend (4), oven (1), Golden Retriever dog (1), cotton (1), dessert (1), cat (1), water (1)	24	8
Valuable/versatile teacher	Nature (2), jewellery (1), gold dust (1), star (1), Planet Earth (1), rainbow (2), instrumental sounds (1), scale (1), dough (1), Kaabe (1), Avatar (1), box (1), sky (1), sun (2)	17	14
Inefficacious/teacher with communication problem	Classical state servant (1), cicada (1), empty glass (1), table (1), leafless tree (1), refrigerator (1), wood/log (2), wall (1), pond in winter (1), knife (1), bitter kernel (1), closed box (1), state (1), crow (1), witch (1)	16	15
Fun teacher	Theme park (1), flower (2), clown (1)	4	3
Teacher as visual image	Mannequin (1), angel (1), princess (1)	3	3
Therapist teacher	Therapist (1), life coach (1)	2	2
Total	-	115	80

know in the field of music’.

‘My music teacher was like a handgun, because s/he was rigid and clear so that I would proceed towards the right purpose’.

‘My music teacher was like a robot, because s/he was systematic, disciplined, and programmed’.

‘My music teacher was like a machine, s/he never stopped working’.

Kind/supportive teacher

This category includes eight metaphors that were used by 24 participants to describe their previous music teachers. The most frequently used metaphors were ‘family’ (f = 17) and ‘friend’ (f = 4). Examples of the statements used by the participants are as follows:

Samples of music students’ explanations are given below;

‘My music teacher was like family, because s/he approached students with mercy and treated us nicely.’

‘My music teacher was like a friend, because s/he had always been by our side’.

‘My music teacher was like an oven, because s/he was very warm-blooded’.

Valuable/versatile teacher

This category includes 14 metaphors that were used by 17 participants to describe their former music teachers. The most frequently used metaphors were ‘nature’ (f = 2), ‘sun’ (f = 2), and ‘rainbow’ (f = 2). Examples of the statements used by the participants are as follows:

‘My music teacher was like nature, because all the nature’s sounds were embodied in his/her being’.

‘My music teacher was like sun, because among all other teachers, s/he was the brightest and most remarkable’.

‘My music teacher was like a rainbow, because s/he contained many colours and values’.

‘My music teacher was like gold dust, because s/he was a very valuable and rare person’.

'My music teacher was like Avatar, because s/he could be an example for me in every respect. Just like Avatar's abilities to control earth, fire, and air, s/he possessed different skills simultaneously'.

Inefficacious/Teacher with communication problem

This category, which concerns the 'dysfunctional, cold teacher with communication problems', includes 15 metaphors that were used by 16 participants to describe their former music teachers. Examples of the statements used by the participants are as follows:

'My music teacher was like wood, because s/he only lectured and s/he did this in a monotonous way, without ever smiling once'.

'My music teacher was (relaxed) like a cicada, because s/he did nothing and s/he never pushed us to do something'.

'My music teacher was like a classical state servant, because all s/he cared was to put the minimum effort to do his/her job and get salary'.

'My music teacher was like a refrigerator, because s/he was very cold and distant'.

'My music teacher was like a pond in winter, because s/he was not friendly; s/he was never close or gentle in her attitude'.

Fun teacher

This category includes three metaphors used by four participants to describe their former music teachers. Their explanations are given below.

'My music teacher was like a clown, because s/he was fun, cheerful, and friendly'.

'My music teacher was like an amusement park, because the most fun and joyful course for the students was music'.

'My music teacher was like a flower, because s/he was a joyful teacher full of energy, and turned lecture into a fun activity'.

Teacher as visual image

This category includes three metaphors used by three participants to describe their former music teachers. Their explanations are given below.

'My music teacher was like a mannequin, because she was very beautiful and attractive'.

'My music teacher was like a princess, because she was very beautiful and elegant'.

'My music teacher was like an angel, because she was very beautiful and she had a very nice voice'.

Therapist teacher

This category includes two metaphors used by two participants to describe their former music teachers. Their statements are given as follows:

'My music teacher was like a life coach, because s/he was genial and radiated a positive energy; s/he was an educator who was able to sense the students' psychological tensions, problems'.

'My music teacher was like a therapist, because after a hectic day, I could relax with her/his practices in the music lecture'.

DISCUSSION

This research was conducted to determine the metaphors used by preservice music teachers in describing their previous music teachers, and to group these metaphors under specific conceptual categories. Saban et al. (2006) state that metaphors can be used as a powerful cognitive tool in exploring and understanding preservice music teachers' personal values, beliefs, and philosophies regarding the concepts of learning and teaching. However, more than one metaphor is needed to explain the concept of 'teacher' as a whole. This is because metaphors correspond to one aspect and not the totality of the entity they attempt to define (Yılmaz et al., 2013; Şengül et al., 2014; Cerit, 2008; Saban et al., 2006).

This study found preservice music teachers used various metaphors, such as 'goddess on earth', 'jewellery', 'clown', and 'Kaaba', to describe their former music teachers. This variation indicates that they were unable to define their former music teachers using one or a few well-known metaphors only. For such reason, the collection method of metaphors can be revised as a semi-structured interview method, which could facilitate the exploration of the participants' personal perspectives in a broader way. The question could be rephrased to:

'Looking into your musical experiences at your school, what kind of metaphor would you use to describe your music teacher?'

In this study, 80 valid metaphors were produced by the participants. These 80 metaphors were grouped into eight different categories, namely, 'guiding/shaping teacher', 'expert/authority teacher', 'kind/supportive teacher', 'valuable/versatile teacher', 'inefficacious/teacher with communication problems', 'fun teacher', 'teacher as visual image', and 'therapist teacher'. The metaphors used were mainly focused on four different roles or characteristics, namely, 'guiding/shaping', 'expert/authority', 'kind/supportive', and 'inefficacious/with communication problems'.

Saban et al. (2006) conducted a study on the metaphorical perceptions of student teachers, and categorized them into 10 types. Three of these

categories, namely, 'guiding/directing teacher', 'fun teacher', and 'therapist teacher' are compatible with this study. However, as Saban et al. (2006) note, the type of school program (or department) and gender emerge as two important factors in such studies. In this respect, perceptions of the preservice music teachers at the Music Education Department were different compared with those in other departments. Therefore, their metaphors were grouped under different categories. In this study, the different categories were formed as 'kind/supportive teacher', 'valuable/versatile teacher', 'inefficacious/teacher with communication problems', and 'teacher as visual image'.

According to Bandura's terminology of psychology (1969), a teacher emerges as a 'figure of authority'. Accordingly, a teacher is a 'representative' of power. In society, people have appointed teachers as counsellors for their kids, and delegated all the power and freedom to the teachers for the sake of their children's success. Majority of the metaphors used by the preservice music teachers are considered under the 'expert/authority teacher' category. These metaphors showed that their former music teachers' understanding and style of teaching and behaviour influenced the class environment. The definition of music teachers within this category is based on their traditional methods of lecturing, creation of teacher-centred class environment and management of the content, information transfer, and the time of the course being set according to their personal decisions (Grasha, 1994).

Similar result also founded by Thompson and Campbell (2003) in which metaphors viewed the teacher as a transmitter of knowledge. According to Grasha (1996), this style of teaching corresponds to a low sensitivity towards student learning. Teachers relying on this style of teaching do not enable interaction among students and cooperative learning. The teacher generally expects the student to prepare for the class and confine their class role to information transfer (Grasha, 1996). In this study, the most frequently used metaphors are 'lion', 'book', 'study plan', and 'machine'.

Guiding and shaping the students' talents is an important dimension in music education, as such teaching role may affect students' vocational choices in the future. The 'Qualifications of Music Teacher' guidebook, which was prepared by the Ministry of Education (MEB) (2008), states that the music teachers are expected to trace the development of their students in terms of musical arts and education, as well as evaluate their development to be able to assist and guide them in vocational choices. Therefore, it was an expected result from the preservice music teachers to view their former music teachers as a person who guides and shapes to be music teachers. The metaphors used by the preservice music teachers were also compatible with the metaphors found in other similar studies (Yilmaz et al., 2013; Cerit, 2008).

Similar result also founded by Thompson and Campbell (2003) in which metaphors characterised the teachers as guide where ideas connected with the roles of leaders, directors, master-apprentice type of relations. The most frequently used metaphors in this category are 'compass', 'map', 'Light', and 'flashlight'.

This study also found that preservice music teachers described their former teachers as 'kind/supportive', which was mainly expressed using the words 'family' and 'friend'. Sünbül (1996) indicated that a good teacher should be friendly, cheerful, sympathetic, and morally honest like family members. Social and emotional behaviours, including showing an interest and liking, relaxing, praising, or criticising, are included in this role.

Under the 'valuable/versatile teacher' category, preservice music teachers used metaphors, such as 'jewel', 'star', 'gold dust', 'nature', 'rainbow', and 'sun'. According to the MEB (2008) guidebook on teacher qualifications, music teachers are expected to possess qualities, such as cognitive, auditory, motion, and intuitive abilities, in addition to personal and vocational qualifications expected from them. According to Uçan (1997), a music teacher needs to fulfil multiple roles, such as a musical artist (composer, vocalist, and interpreter), a musical researcher, and a music educator. The preservice music teachers' use of metaphors under this category indicates that their former music teachers possessed a multidimensional understanding of music education.

This study also found a number of negative metaphors used to describe their former music teachers, and grouped them under the 'inefficacious/teacher with communication problems' category. These negative metaphors include 'wood/log', 'crow', and 'leafless tree'.

Nevertheless, Uçan (1996) proposed that teachers in arts education need to be knowledgeable, conscious, good-mannered, sensible, and selective to follow a strategy of educating students who use music while enjoying it. The main purpose in such principles is to develop and enrich the artistic knowledge, manners, interests, desires, and talents of individuals.

However, the music teachers, who were described in this category, were perceived to be possessing characteristics that are contrary to what is expected from them. The preservice music teachers' statements were striking when they were explaining their metaphors. These explanations elucidated how music teachers were behaving towards their students, and were mainly focus on the lack of consideration to see their students as individuals. The teachers also did not value the students accordingly. Their characteristics included anger, ignorance of cultural differences and interests, ineffective process of teaching and learning, reluctant in teaching, lacking in communication skills and motivation in their profession development, and lack of aesthetic and ethical understanding.

In the 'fun teacher' category, only four students

admitted that they had an experience with such music teachers. A similar result was found in the study by Saban et al. (2006). The latter study explained this result as a reflection of the principle that 'teaching is a serious job', a prevalent approach in Turkish culture. According to the findings in the present study, only four students thought their former music teachers were enjoyable and fun. The reason for this is that the teachers who focus on teacher-centred traditional rather than the contemporary music teaching methods ignore the music teachers' feature as a fun teacher. Especially, teacher training institutions should not neglect the need to train 'fun teachers', which can be a feature of an effective music teacher. The end goal of music education is not to enjoy; however, students who are having fun while learning are more likely to learn better and practice more often.

Very few pre-service music teachers described their former music teachers as 'therapist teachers'. It is well known that artistic therapies have an integrating and healing potential; therefore, this potential is used as an instrument for psychological insight and emotional maturation. These therapies include all artistic practices, including painting, music, drama, cinema, motion, and dancing. Studies in this area have shown that art therapies are effective in reducing anxiety, depression, fatigue, and symptoms of stress, as well as increasing health indicators of quality of life significantly (Aydin, 2012). Metaphors used by the pre-service music teachers about their former music teachers do not include a high frequency of the therapist role of the teacher. In other words, music courses in Turkey do not intend to use music as an instrument of therapy and relaxation. However, the category of 'Teacher as Visual Image' indicates that the teachers' choices of clothing, attitudes, and behaviours that reflect aesthetic and taste are noticed by the students.

CONCLUSION

The findings of this study showed that firstly, metaphors are powerful tools in understanding the preservice music teachers' previous personal experiences and perceptions about their former music teachers. Secondly, preservice music teachers perceive their music teachers as 'guiding and shaping' their talents which is an important dimension in music education. The promotion of music at early ages accelerates the development in music.

Former music teachers' guidance, is believed, helped music students to understand their potentials. Moreover, preservice music teachers also considered their teachers as a member of their family, and believed to have forged a great connection between them and their music teachers. The compassion and affection between teachers and students are important, as teachers are vital in providing the social and emotional needs of students. Thirdly, looking at former music teachers' teaching approach; they were shown as transmitter of knowledge

and authoritarian who practiced with traditionally teacher-centred approach. It is believed that pre-service music teachers' lack of previous experiences at school on contemporary music teaching approaches may have an effect on their practice of music teaching.

In general, teachers teach their subject in the same way as they were being taught, and teacher training programs have little influence to change these practices. It is believed that more student centred approaches are needed to be introduced and used at teacher training programmes in order to replace old learning styles with new ones. The last and unfortunate finding was perceptions of music teachers who were shown as cold, angry, and reluctant to teach. This unexpected result however, can be explained by earlier research study which showed that in Turkey, music teachers have complained over their working environments, working hours, salaries, and students' attitudes towards music lessons (Otacıoğlu, 2008).

Pre-service music teachers need to be prepared for the job environments, and how to improve the environment of music classes where they can be successful and happy. Music classes with the necessary materials and instruments may increase the motivation of music teachers, thereby affecting their attitudes of students towards music education.

To have a deeper understanding of music teachers in Turkey, more research is needed. The role of music teacher training departments and pre-service music teachers' attitudes, perceptions, and experiences towards their former training must be emphasized.

CONFLICTS OF INTEREST

The authors have not declared any conflict of interests.

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Full Length Research Paper

Development of the nonverbal communication skills of school administrators scale (NCSSAS): Validity, reliability and implementation study

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The main purpose of this study is to develop a scale intended for identifying the school administrators' nonverbal communication skills, and establish the relationship between the nonverbal communication skills of school administrators and job performance of teachers. The study was conducted in three stages. The first stage involved the creation of a pool of items based on a literature review, and the performance of an initial pilot test for item analysis. In the initial pilot test, the scale was applied to 109 primary school teachers. In the second pilot test, the validity and reliability of the scale was tested by being applied to 220 teachers. According to the exploratory factor analysis results, the scale consisted of 29 items and seven sub dimensions. The contribution made to the variance by sub dimensions was 71.93. Factor loadings varied between 0.57 and 0.87. The confirmatory factor analysis (χ^2/df , 1.365; RMSEA, 0.041; CFI, 0.965; IFI, 0.966; GFI, 0.869; AGFI, 0.858; RMR, 0.058) was conducted on the structure resulting from the performance of the exploratory and the validity of the structure was established. The Cronbach Alpha value of the scale was established as 0.897. The third stage of the study saw the performance of a study conducted on 289 teachers with a view to presenting the relationship between the nonverbal communication skills of school administrators and the job performance of teachers. According to the results, there is a positively significant relationship between the nonverbal communication skills of school administrators and the job performance of teachers ($r=0.41$, $p<0.01$).

Key words: School administrators, nonverbal communication skills, teacher job performance.

INTRODUCTION

Employed in a network of communication, one of the most fundamental qualities that an educational administrator should possess is the communication skills. Communication is defined as a process in which people convey their thoughts, feelings and attitudes to the

intended recipients through written or non-verbal symbols. Non-verbal communication skills are as important as verbal communication skills in interpersonal relationships.

Ramadanty and Martinus (2016) suggest that the

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interpersonal communication and non-verbal communication skills of administrators have a significant bearing on the professional motivation of the employees. It is reported that, in a face to face interpersonal communication process, 35% of the message intended to be delivered to the interlocutor is got across verbally while the remaining 65% is delivered through non-verbal means (Birdwhistell, 1970).

According to Mehrabian and Ferris (1967), the total effect of a message during the communication process is made up of verbal (just words) (approximately 7%), vocalic (tone of voice, voice inflexion and other sounds) (38%) and non-verbal elements (55%).

Hickson et al. (2004) on the other hand, suggest that verbal codes determine 35% of the communication process while the remaining 65% is determined by non verbal codes. It appears that non-verbal elements take the lion's share in conveying a message in the interpersonal communication process.

In the literature, Mehrabain (1971) employs the concept of "immediacy" instead of the concept of non-verbal communication. "Immediacy" is the perception of physical and psychological proximity between persons in communication. Non-verbal immediacy includes gesticulation (hands, arms head), eye contact and body language, and increases emotional intimacy among people (Andersen, 1979; Mehrabian, 1971).

Burgoon et al. (1996) define non-verbal communication as non-verbal dialogue. The communication conducted via bodily gestures represents non-verbal communication. Non-verbal communication is defined by hair styles and attire, eye contact and facial expressions, bodily gestures and posture, physical contact and gesticulation (Finset and Piccoli, 2010).

According to Güneş (2011), non-verbal communication represents the expression, information or behavior that does not contain the spoken word. Non-verbal communication covers all the aspects of communication except for words. In addition to gestures and body language, non-verbal communication also includes voice level, tone of voice, pauses and accentuation (Wood, 2009).

While the elements of non-verbal communication are defined as kinesics, paralanguage, physical appearance, Touch, Artifacts, Proxemics, Chronemics, Silence; the elements of body language are defined as facial expressions, gestures, posture and eye contact (Burgoon et al., 2009; Calero, 2005; Knapp et al., 2014; Richmond and McCroskey, 2004; Tayfun, 2011; Verderber et al., 2010; Wood, 2011).

The medium that is applied most in getting across a message in non-verbal communication is that of body language. An important means of non-verbal communication, kinesics is the total of bodily movements, gestures, facial expressions and posture that are used in expressing one's thoughts and feelings to their

interlocutor (Tayfun, 2011).

Being an important part of non-verbal communication, Paralanguage represents the way in which voice is used in the communication process. Paralanguage is a form of verbal communication that excludes words; rather, it relies on such vocal properties as intonation, rhythm, loudness, change of vocal tone and murmur (Wood, 2011).

Another aspect of non-verbal communication is physical appearance. Personal hygiene and upkeep, attire, accessories and makeup make significant contributions to one's physical appearance. The choice of such accessories as jewelry, shoes, ties, handbags, briefcases etc. and the harmony thereof are significant in terms of creating a positive physical appearance (Debasish and Das, 2009).

Being an aspect of non-verbal communication, touch represents communication through physical contact. Pointing out that tactile contact may vary from one culture to another, Heslin and Alper (1983) states that there are five different types of tactile contact: professional and functional tactile contact (as in the case of doctor or dentist touching his/her patient), social and polite tactile contact (such as hand shake), friendly contact (welcoming, bidding good bye etc.), love and affectionate contact, and tactile contact of sexual nature.

Manipulable objects and their environmental properties (artifacts) include symbols, images and colors. In communication, messages are conveyed through the objects within the environment and through the environment itself. There are a number of environmental signs that have a bearing on non-verbal communication such as temperature, noise, furniture layout, building design, pictures, flowers etc. Moreover, the backpacks, briefcases, mobile phones carried by people may also influence the nature of communication (Guerrero and Farinelli, 2009).

Use of distance and location (Proxemics) represents the use of space in interpersonal communication. The physical distance between people determines the degree of communication in interpersonal relationships. According to Cüceloğlu (2006), people do not use the space they find themselves in in a haphazard way, but rather they use it in parallel with the feelings they harbor towards one another, i.e. the distance between them increases or decreases when talking to each other. Hall (1990) has specified four different distance zones in proxemics: intimate distance (0-35 cm), personal distance (40 to 80 cm), social distance (80 cm to 2 m) and public distance (2 m and above). Despite the fact that the distance and the reactions resulting therefrom vary based on cultural norms and they type of relationship existing between the parties, the boundaries to be set is nevertheless known to be significant in determining the interpersonal communication (Tayfun, 2011).

Being an important aspect of non-verbal communication, chronemics is an area of study concerning the use of time (Steinberg, 2007). According to West and Turner (2010), chronemics helps us realize how we perceive time in human relationships and dialogues. According to Tutar and Yılmaz (2010), time is power and respect. That is to say, you are as powerful and respected as the amount of time allocated to you.

“Silence” as a significant aspect of non-verbal communication, represents being quiet and mute. Bruneau (1973) suggests that there are three forms of silence: psycholinguistic silence, interactional silence and socio-cultural silence. Being quiet or mute may result from a variety of reason, none of which is coincidental. Each form of silence has a unique meaning that may lead to various different interpretations and consequences. The form of communication that determines the true meaning of such forms of silence is the nature of relationship existing between the individuals and their body language.

Non-verbal communication scales

The first studies intended for creating a non-verbal communication scale to be used in the educational field are attributed to the works of Andersen et al. (1979). The researches opted for the concept of “immediacy” instead of the concept of non-verbal communication.

Andersen et al. (1979) suggest that non-verbal communication can be measured by three different types of observation, the first of which being subjective Gestalt perceptions. In this type of observation, non-verbal communication is defined and people are provided with relevant information and asked to answer general questions.

The second type of observation involves the measurement of perceived non-verbal communication behaviors through a control list. The control list consists of items that are conceptualized as “immediacy”. The third type of observation involves the measurement of individual non-verbal communication behaviors, conceptualized as “immediate”, by coding and objectively counting them. In this fashion, Andersen et al. (1979) have developed the following three scales:

- (1) Perceived behavioral indicants of immediacy scale (BII)
- (2) The Generalized immediacy scale (GI), and
- (3) The trained raters perceptions of immediacy scale (RI).

BII scale has been designed to measure the non-verbal communication behaviors of a teacher as perceived by his/her pupils. Originally, having been designed to include 28 items, 13 items with less than 0.45 loadings following the factor analysis were removed from the scale. Of the removed items, ten of them were considered to be less

central in non-verbal communication. The items in question were about the attire of the educator, amount of student discussion, teacher's position in the classroom and the amount of time spent with students. Two of the other elements were about tactile contact. Researchers reported that the scale was single dimensional. The reliability score of the scale of fifteen items was measured as 0.93.

The GI scale was developed to include 9 items for the purpose of measuring the general and gestalt non-verbal communication behaviors of teachers. The scale initially addressed the definition of immediate behaviors and its related elements. And then required participants to measure the teacher's style of teaching by way of ticking the boxes (such as: cold _: _: _: _: _: warm). The factor loadings for all 9 items ranged between 0.73 and 0.93. Reliability of single dimensional scale was measured as 0.97.

The RI scale developed for measuring the non-verbal communication behaviors of teachers based on the opinions of students who have been trained in the field of non-verbal communication consists of 11 items. The factor loading of items ranges between .47 and .87. The reliability of the scale has been calculated as 0.82.

The BII scale developed by Andersen et al. (1979) have been revisited and revised by Richmond et al. (1987). The Nonverbal Immediacy Measure (NIM) has been developed by Richmond et al. (1987) with the aim of measuring the non-verbal communication skills of teachers and students. The reliability of the 14 item scale has been found by most studies to be between .70 and .85. The NIM was later revised by McCroskey et al. (1995). Originally designed to include 14 items, the NIM was later reduced to 10 items with the removal of items concerning tactile contact, sitting and standing. It was reported that the removed items were not reliable determinants of the non-verbal communication skills of a teacher. Moreover, it was claimed that the removal of such items from the reliability analysis would improve the reliability or have no effect on it at all.

On account of the reliability and validity issues associated with the NIM, Richmond et al. (2003) developed the Nonverbal Immediacy Scale (NIS). The items of this scale consists of the scale items that were developed or revised by Andersen et al. (1979), Richmond et al. (1987) and McCroskey et al. (1995). It consists of a total of 26 items -13 negative and 13 positive- aimed at measuring non-verbal communication skills. The responses were received through a 5 point Likert type scale (1=never, 2=seldom, 3=sometimes, 4=often, 5=always). As a result of the reliability and validity studies conducted by Richmond et al. (2003), it was reported that the scale was of a single factor type and the Cronbach Alfa reliability coefficient was .90. This scale is still in use today.

As a result of the literature study, the following have

been identified as the elements of the non-verbal communication: kinesics, paralanguage, physical appearance, touch, artifacts, proxemics, chronemic and silence. According to the literature, it appears that he previously developed scales have not fully reflected all the elements of nonverbal communication -which have multiple aspects- on account of being single dimensional. Some of the items covering such elements either have not been included in the scales at all or excluded from the scales on the grounds that they affected the reliability of the scale. Although being the most up-to-date scale, the NIS developed by Richmond et al. (2003) does not contain items regarding such nonverbal communication elements as Physical Appearance, Artifacts, Chronemics and Silence.

On the other hand, while studies are being conducted on the effect of the nonverbal communication behaviors of teachers on students (Comadena et al., 2007; Martin and Mottet, 2011; McCroskey et al., 2006; Pribyl et al., 2004; Pogue and AhYun, 2006; Witt and Wheelless, 2001); no scales has been developed so far to measure and evaluate the nonverbal communication skills of school administrators. In this respect, we believe that it is important to develop a scale both for school administrators and for including many of the aspects of the nonverbal communication that have thus far been left out. With this aim in mind, the previously developed or revised scales have been examined and efforts made into developing a nonverbal communication skills scale so as to include all the nonverbal communication elements in accordance with the literature.

School is a network of communication and the educational administrators are in constant communication with people. The school administrators spend more than 70% of their time on communication (Lunenburg and Ornstein, 2013). The studies so far conducted prove that the nonverbal communication elements have a significant role in interpersonal communication (Birdwhistell, 1970; Hickson et al., 2004; Mehrabian and Ferris, 1967).

In conclusion, one might argue that, in addition to the verbal communication, nonverbal communication, too, has a crucially important role in the educational life. For this reason, it is imperative to ensure that all the school employees, especially the administrators, acquire nonverbal communication skills in addition to verbal communication skills in conducting interpersonal relationships. The present study aims to develop a scale that is intended to measure the nonverbal communication skills of school administrators and evaluate the relationships between the nonverbal communication skills of school administrators and the professional performance of teachers.

Job performance

Job performance represents the degree of success

achieved in any given profession (Demirtaş and Güneş, 2002). Balcı (2010) defines performance as the output or end product produced as a result of the processing of the input at the disposal of the individual through his/her cognitive, emotional and behavioral strength in the environment he/she is in.

Professional performance is a concept that measures the degree of success in achieving a set goal and to what extent the goals have been achieved. The professional performance of a teacher is about how successful that teacher is in fulfilling his duties and responsibilities. A teacher with high professional performance successfully lives up to his/her duties and responsibilities and makes significant contributions to the school's academic success. The academic success of a school is closely associated with the professional performance of its teachers.

Studies suggest that negative physical conditions and in-house escalations increase the number of complaints raised by the teachers and this, in turn, leads to the reduction of their performance; on the other hand, high wages, maintaining good communication and positive relationship with the administrators improve their professional performance (Akbaba and Kipici, 2015).

The studies suggest that the professional performance of teachers is associated with such variables as job satisfaction (Arifin, 2015; Koç et al., 2009); leadership (Adeyemi, 2010; Cerit, 2012; Okoji, 2015, Özdemir and Yirmibeş, 2016); organizational justice (Altaş and Çekmecelioğlu, 2015; Kalay, 2016); and organization climate (Balkar, 2015). On the other hand, there is a significant relationship between communication and the employee's professional performance (Asamu, 2014; Dehghan and Ma'toufi, 2016; Khuong et al., 2016).

The main purpose of this study is to develop a scale intended for measuring the nonverbal communication skills of school administrators and reveal the relationship between the nonverbal communication skills of school administrators and the professional performance of teachers using this scale.

METHODOLOGY

Objective of the study

The main purpose of this study is to develop a scale intended for measuring the nonverbal communication skills of school administrators, and reveal the relationship between the nonverbal communication skills of school administrators and the professional performance of teachers by using this scale.

Study group

The initial pilot study group consisted of the primary teachers that work at 18 different primary schools located in the city center of Giresun, Turkey. During the initial pilot implementation where the item analysis was conducted and items examined in terms of their compatibility with the entire scale, the scale was applied to 109

teachers that were selected based on random sampling. If the number of items included in the scale during the pilot implementation stage is 30 or more, then reaching out to sample size that is 2 or 3 times the number of items in the scale will be sufficient (Seçer, 2015).

In this respect, it can be argued that 109 teacher -selected through simple random sampling method- will be enough for item analysis. Of those teachers 65 of them were male (59.6%), 44 of them female (40.4%), 11 of them were at the age of 22 to 31 (10.1%), 19 of them at the age of 32 to 41 (17.4%), 31 of them at the age of 42 to 51 (28.4%), 45 of them at the age of 52-61 (41.3%) and 3 of them at the age of 62 and over (2.8%).

During the second pilot implementation where the factor structure of the scale was tested, the scale was applied to 220 teachers -selected based on simple random sampling method- who were employed at 18 different schools located in the city center of Giresun. Of those teachers 117 of them were male (53.2%), 103 of them female (46.8%), 31 of them were at the age of 22 to 31 (14.1%), 57 of them at the age of 32 to 41 (25.9%), 61 of them at the age of 42 to 51 (27.7%), 66 of them at the age of 52-61 (30.0%) and 5 of them at the age of 62 and over (2.3%). Seçer (2015) suggests that the fact that the number of participants -which are being determined during the factor analysis- are five or ten times the number of items in the scale can be taken as a basis.

A correlational screening model was employed for using the scale in a research and reporting on its results. The study group of this study consists of 289 primary school teachers that work in 18 different primary schools located in the provincial center of Giresun, Turkey, and who have been selected based on simple random sampling method. Of those teachers 157 of them were male (54.3%), 132 of them female (46.3%), 37 of them were at the age of 22 to 31 (12.8%), 70 of them at the age of 32 to 41 (24.2%), 83 of them at the age of 42 to 51 (28.7%), 94 of them at the age of 52-61 (32.5%) and 5 of them at the age of 62 and over (1.7%). 24 of the teachers (8.2%) were single and 265 of them (91.7%) married. While 23 of them (8%) had a work experience of 1 to 5 years, 42 of them (14.5%) had been employed for 6 to 10 years, 27 of them (9.3%) 11 for 15 years, 45 of them (15.6%) for 16 to 20 years, 152 of them (52.6%) for more than 20 years.

The process of developing a data gathering tool

During the process of developing a School Administrator's Nonverbal Communication Skills Scale, priority was given to the development of literature screening related nonverbal communication skills, and a pool of 42 items were created. In creating the items, the existing nonverbal communication skills scales were studied (Andersen et al., 1979; McCroskey et al., 1995; Richmond et al., 1987; Richmond et al., 2003).

At the end of this endeavor, the following dimensions, with the corresponding items, were created: kinesics, paralanguage, physical appearance, touch, Artifacts, proxemics, chronemics, silence. Expert opinion was sought for the 42 items thus created with respect to the nonverbal communication skills (2 communication experts, 2 educational management experts, 1 linguist, 2 evaluation and assessment experts). The experts were given an assessment form consisting of open and closed ended questions. The experts were asked to state their opinions regarding the items by saying "pertinent" "not pertinent" and "neutral" and the recommended they corrections they deemed necessary. In line with the opinions received from the experts, it was established that there was no need to remove any item from the scale but some of the statements needed revising. Once the necessary revisions and corrections were made in the scale, the "School Administrator Nonverbal Communication Skills Scale", consisting of 42 items, was created. The scale was designed in the form of a 5-point Likert type

scale (1-Never, 2-Rarely, 3-Sometimes, 4-Often, 5-Always). The items were then submitted to a linguist for perusal, and the scale took its final form. A pilot test was launched to try out the initially created 42-item scale. With the pilot test, it was intended to analyze the scale items and evaluate the compatibility of items with the entire scale. With this aim in mind, the scale was applied to a group of 109 teachers who are capable of representing the study group. After the pilot test, an item analysis was conducted to establish which items were more pertinent and which of them proved problematic in terms of total item correlation. As a result, seven items with very poor total item correlation were removed from the scale in line with the opinions of the field experts.

After the initial pilot test, the scale, now reduced to 35 items, was put to a second pilot test. In the second pilot test, the scale was reapplied to a study group that consisted of 220 teachers. An exploratory factor analysis was applied to the data thus obtained with a view to determining the factor structure of the scale. As a result of the factor analysis, it was established that the scale had a seven factor structure. In order to test out the validity of this seven-dimensional structure, a Confirmatory Factor Analysis (CFA) was applied.

In addition to the CFA and in order to identify to what extent the scores obtained from the scale were reliable, the Cronbach Alpha internal consistency coefficient -calculated based on the item analysis- was taken as a reference. Finally the process of developing a "School Administrators' Nonverbal Communication Skills Scale" was completed.

Evaluation of the job performance

The teachers' job performance was measured in accordance with the statements developed by Sigler and Pearson (2000) and Kirkman and Rosen (1999). The statements in question were adapted to the Turkish context by Çöl (2008). The adapted versions of the statements were, once again, subjected to exploratory and confirmatory factor analyses. As a result of the factor analysis, it was established that the job performance had a single factor structure and that the contribution made by the said factor to the total variance was around 68.26%. Factor loadings ranged between .797 and .844. A confirmatory factor analysis was performed to validate the single factor structure. According to the results of the CFA, the fit indices for the model were calculated as χ^2/df ratio 1.13 ($\chi^2=2.271$, $df=2$, $p<0.000$). The fit indices for the model were found to be as follows: RMSEA= 0.022, GFI=0.99; AGFI= 0.98, CFI= 0.99, IFI= 0.99, RFI=0.98, NFI=99, RMR= 0.005. Such values show that the goodness of fit is at a perfect level (Perfect goodness of fit values are presented in the Table 3). Reliability (Cronbach Alpha) of the items regarding to the job performance was calculated as 0.84.

Data analysis

Exploratory (EFA) and confirmatory (CFA) factor analyses were employed to establish the factor structure of the nonverbal communication skills scale. A correlation analysis was performed to identify the relationship between the school administrators' nonverbal communication skills of and the teachers' job performance. The SPSS software was used for the EFA, while the AMOS software was used for the CFA.

RESULTS AND DISCUSSION

Item analysis

Prior to the performance of exploratory factor analysis, an

Table 1. Item analysis results.

Item	Scale average if item is removed	Scale variance if item is removed	Total item correlation	Cronbach alfa if item is removed
i1	156.9358	253.061	0.352	0.795
i2	156.5505	257.324	0.308	0.797
i3	155.9266	254.106	0.459	0.794
i4	155.5505	236.287	0.045	0.875
i5	156.6147	255.832	0.324	0.797
i6	157.8073	254.916	0.259	0.798
i7	155.9358	256.283	0.385	0.796
i8	155.8440	257.244	0.406	0.796
i9	155.7982	256.551	0.410	0.796
i10	155.8440	256.966	0.410	0.796
i11	156.0367	251.276	0.445	0.793
i12	155.8349	251.843	0.484	0.793
i13	155.9083	252.269	0.515	0.793
i14	155.8073	252.176	0.576	0.792
i15	155.6514	255.637	0.518	0.795
i16	155.5229	258.733	0.445	0.797
i17	155.7615	256.109	0.439	0.795
i18	157.1835	251.522	0.349	0.795
i19	157.6606	251.800	0.315	0.796
i20	157.7890	252.335	0.350	0.795
i21	158.0459	253.248	0.310	0.797
i22	156.1284	250.317	0.498	0.792
i23	156.1743	249.664	0.558	0.791
i24	156.0000	253.722	0.513	0.794
i25	156.1193	250.550	0.578	0.791
i26	156.0550	251.515	0.531	0.792
i27	156.4771	246.696	0.560	0.789
i28	156.0275	253.897	0.485	0.794
i29	156.6422	255.158	0.311	0.797
i30	156.3761	255.181	0.396	0.795
i31	156.5321	254.029	0.401	0.795
i32	156.7523	255;873	0.268	0.798
i33	155.6239	258.089	0.433	0.797
i34	155.6881	256.235	0.494	0.795
i35	155.5505	258.453	0.467	0.797
i36	155.7798	255.155	0.464	0.795
i37	157.4037	264.539	0.002	0.807
i38	157.3303	261.057	0.104	0.803
i39	158.3028	264.695	0.009	0.806
i40	157.2936	258.339	0.196	0.800
i41	157.4312	263.692	0.053	0.804
i42	157.9633	265.888	-0.024	0.807

item analysis was performed on the assessment tool as the first stage of the process. Item analysis establishes the internal consistency of the scale and the compatibility of each item to the entire scale. As a result of this analysis, the items that were more pertinent and those

proved to be problematic in terms of total item correlation were identified. The results of this analysis are presented in Table 1.

Observing Table 1, it appears that the total item correlations range between -.024 and .578. The total item

correlations are expected not to be negative, but to be at least 0.20 (Tavşancıl, 2014). Büyüköztürk (2014) suggests that, in total item correlations, the items with the correlation of 0.30 and above distinguishes individuals better, and that the items between 0.20 to 0.30 can be tested or should be corrected if deemed necessary, and that the items below 0.20 should not be tested at all.

Accordingly, the total item correlation values of the items 4, 37, 38, 39, 40, 41 and 42 were found to be less than 0.20. Such items were removed from the scale in line with the opinion of the experts. According to Table 1, the total item correlation value of the item number 6 is .259; and the total item correlation value of the item number 32 is 0.268. The field experts suggested that those two particular items assessed significant behaviors in the factor they were in and thus they had to be included in the scale in terms of the content. These two items were not removed from the scale. For the remaining 35 items, the Cronbach Alpha value of the scale was calculated as .904.

Exploratory factor analysis (EFA)

An EFA was performed for establishing the factor structure of the scale. First of all, efforts were made to see whether the data gathered from 220 teachers was consistent with the factor analysis. To this end, Kaiser-Meyer-Olkin (KMO) value and Bartlett Sphericity Test (BTS) were performed. Since the KMO coefficient for the scale was calculated as 0.88, the sample size can be accepted as ok. The result of the Bartlett Sphericity Test was found as follows: ($\chi^2=4625.013$, $df=595$ and $P<0.05$). This result suggests that the scale is suitable for the factor analysis (Çokluk et al., 2014; Field, 2013).

In order to determine the factor structure of the scale, a basic components analysis and varimax method were employed. In the factor analysis, the acceptance level for factor loadings was determined as 0.40 (Field, 2013). As a result of the analysis, there were identified eight factors for 35 items whose eigenvalue was over 1. The items in those factors were evaluated in terms of being overlapped and whether they met the acceptance level for factor loadings. It was observed that five items (items number 3, 16, 17, 27, 28) were overlapped and that the factor loading of one item (11th item) was below the acceptance level. Such items were removed from the scale one by one and the remaining items were once again subjected to an exploratory factor analysis. The factor pattern achieved as a result of the removal of the problematic items and the item factor loadings are presented in the Table 2.

Once the inconsistent items were removed, it was observed that there were seven factors for 29 items whose eigenvalue was over 1. The contribution of these factors to the total variance was established as 71.93%.

The variance was calculated for the first factor as 14.28%, for the second factor as 10.56%, for the third as 10.48%, for the fourth as 9.53%, for the fifth as 9.52%, for the sixth as 9.33% and for the seventh as 8.22%. Based on the contents of the items, such factors were ascribed the following names in accordance with the literature: (1) Artifacts, (2) Tactile Contact, (3) (Paralanguage), (4) Proxemics, (5) Kinesics, (6) Chronemics, (7) Physical Appearance.

Confirmatory factor analysis (CFA)

In order to determine the validity of the 7 factor structure resulting from the exploratory factor analysis a CFA was performed. A path diagram and the statistics of fitness were calculated for the 29 item 7 factor model.

According to the results of the confirmatory factor analysis, the χ^2/df ratio was calculated as 1.688 ($\chi^2=600.916$, $df= 356$, $p<.000$). The fact that the χ^2/df ratio is less than 2 is considered to be a perfect fit (Kline, 2005). The ratio found in this study (1.688) proves that the assessment model fits well with the data. In order to evaluate the fitness of the model, other goodness of fit indices were calculated respectively. The goodness of fit indices for the model were found to be as follows: RMSEA= 0.056, GFI= 0.833, AGFI= 796, CFI= 0.934, IFI= 0.935, RMR= 0.053. The CFA results suggest that the goodness of fit values were not at the desired level. In order to bring the goodness of fit values up to scratch, some of the items were modified.

Following the examination of the modification indices, only the modification indices for the items of same size were taken into consideration in parallel with the theoretical foundation of the scale. In this respect, modifications were made to the items 22 and 23 in the artifacts dimension; to the items 17 and 18 in the paralanguage dimension; to the articles 29 and 30 in the proxemics dimension, and the CFA was repeated.

According to the CFA results, the goodness of fit indices of the model was reexamined and the χ^2/df ratio was calculated as 1.365 ($\chi^2=481.836$, $df= 353$, $p<0.000$). The goodness of fit indices of the model were established as follows: RMSEA= 0.041, GFI=0.869; AGFI= 858, CFI= 0.965, IFI= 0.966, RMR= 0.058. Table 3 presents the goodness of fit values of the scale.

According to the CFA findings presented in the Table 3, the level of statistical significance (p), χ^2/df , RMSEA, CFI, IFI, goodness of fit values were found to be perfect; while the RMR, GFI and AGFI goodness of fit values were found to be acceptable. It appears that the values regarding the entire model are either acceptable or perfect. According to the results of the confirmatory factor analysis, the values regarding the path diagram are presented in Figure 1 for the purpose of determining the loadings between the factors.

Table 2. Factor distributions and factor loadings.

Variable	Factor loading values						
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor7
M22	0.808	-	-	-	-	-	-
M23	0.876	-	-	-	-	-	-
M24	0.830	-	-	-	-	-	-
M25	0.873	-	-	-	-	-	-
M26	0.832	-	-	-	-	-	-
M18	-	0.799	-	-	-	-	-
M19	-	0.824	-	-	-	-	-
M20	-	0.838	-	-	-	-	-
M21	-	0.832	-	-	-	-	-
M7	-	-	0.728	-	-	-	-
M8	-	-	0.830	-	-	-	-
M9	-	-	0.839	-	-	-	-
M10	-	-	0.785	-	-	-	-
M29	-	-	-	0.740	-	-	-
M30	-	-	-	0.797	-	-	-
M31	-	-	-	0.857	-	-	-
M32	-	-	-	0.726	-	-	-
M1	-	-	-	-	0.790	-	-
M2	-	-	-	-	0.801	-	-
M5	-	-	-	-	0.736	-	-
M6	-	-	-	-	0.755	-	-
M33	-	-	-	-	-	0.748	-
M34	-	-	-	-	-	0.765	-
M35	-	-	-	-	-	0.803	-
M36	-	-	-	-	-	0.656	-
M12	-	-	-	-	-	-	0.608
M13	-	-	-	-	-	-	0.794
M14	-	-	-	-	-	-	0.780
M15	-	-	-	-	-	-	0.577

Table 3. Goodness of fit values.

Goodness of fit values	Perfect	Acceptable	Study finding
P	$0.05 \leq p \leq 1.00$	$0.01 \leq p \leq 0.05$	0.000
χ^2/df	0-2	2-3	1.365
RMSEA	$\leq .05$	$\leq .08$	0.041
RMR	$\leq .05$	$\leq .08$	0.058
CFI	$\geq .95$	$\geq .90$	0.965
IFI	$\geq .95$	$\geq .90$	0.966
GFI	$\geq .90$	$\geq .85$	0.869
AGFI	$\geq .90$	$\geq .85$	0.858

Adapted from Çokluk et al. (2014), Kline (2005), Seçer (2015) and Tabacknick and Fidell (2001).

Reliability study

The reliability of the scale was calculated based on the

data obtained from 220 teachers. The Cronbach alpha values were calculated with respect to the main and sub dimensions of the scale for the purpose of determining

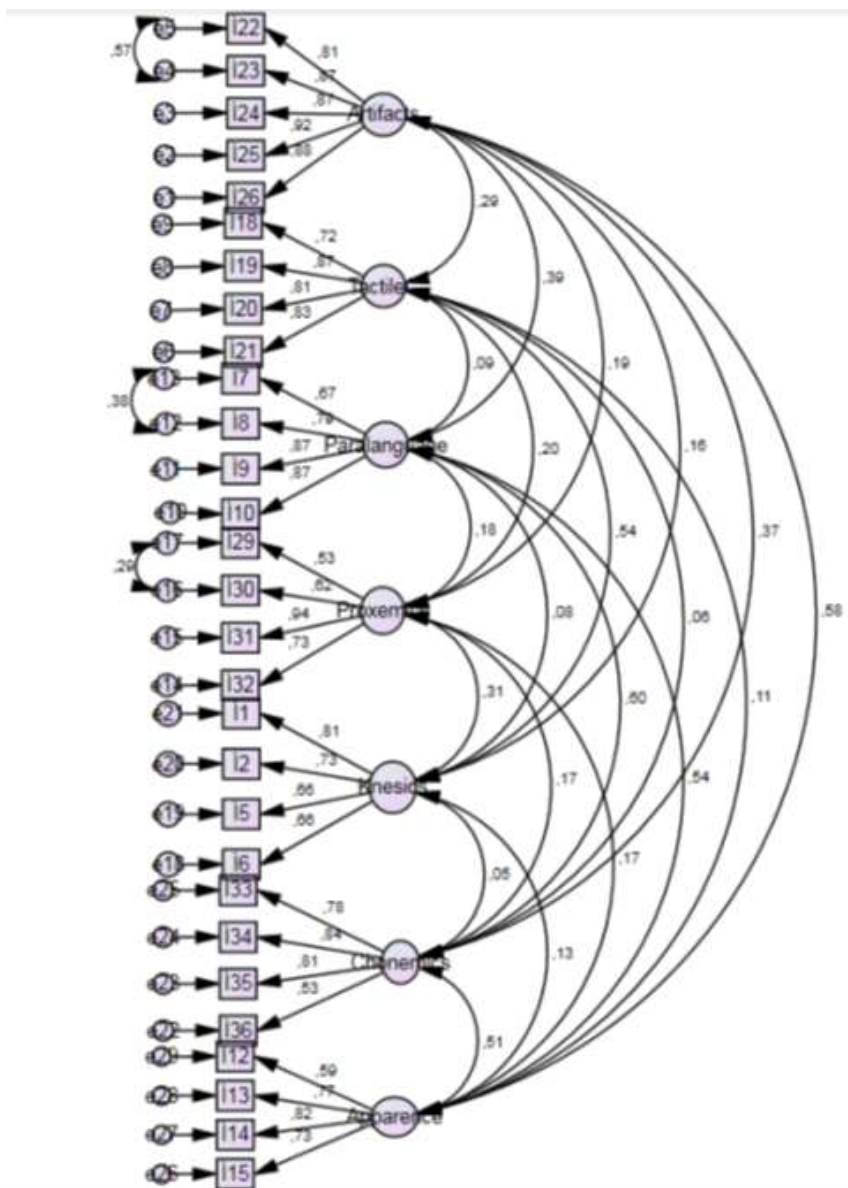


Figure 1. Path diagram.

the internal consistency coefficients of the reliability of the scale. The values obtained are presented in the Table 4. According to the Table 4, the Cronbach Alpha value for all 29 items of the scale was calculated as 0.897. The reliability coefficients for the dimensions were calculated as follows:

- (1) Artifacts, 0.939
- (2) Tactile contact, 0.892
- (3) Paralanguage, 0.885
- (4) Proxemics, 0.816
- (5) Knesics, 0.820

- (6) Chronemics, 0.798 and
- (7) Physical Appearance 0.777.

Such values prove that the scale is reliable. The final version of the scale, complete with the calculation of its reliability, is presented in the Annex 1.

Implementation of the study

The scale that was developed to determine the nonverbal skills of school administrators was applied to the study

Table 4. Cronbach Alpha values regarding the school administrators' nonverbal communication skills scale.

Dimensions	Cronbach Alfa
Artifacts	0.939 (5 items)
Tactile contact	0.892 (4 items)
Paralanguage	0.885 (4 items)
Proxemics	0.816 (4 items)
Knesics	0.820 (4 items)
Chronemics	0.798 (4 items)
Physical appearance	0.777 (4 items)
Nonverbal communication skills of school administrators	0.897 (29 items)

Table 5. Mean and standard deviation values and the relationship among the variables.

Variables	\bar{X}	SS	1	1a	1b	1c	1d	1e	1f	1g	2
1 Nonverbal com. skills	3.86	0.46	--	-	-	-	-	-	-	-	-
1a. Artifacts	3.95	0.88	0.73**	-	-	-	-	-	-	-	-
1b. Tactile contact	2.75	0.98	0.62**	0.29**	-	-	-	-	-	-	-
1c. Paralanguage	4.37	0.59	0.58**	0.37**	0.13*	-	-	-	-	-	-
1d. Proxemics	3.64	0.83	0.55**	0.24**	0.20**	0.18**	-	-	-	-	-
1e. Knesics	3.34	0.84	0.56**	0.16**	0.46**	0.12*	0.28**	-	-	-	-
1f. Chronemics	4.54	0.53	0.51**	0.35**	0.07	0.51**	0.17**	0.02	-	-	-
1g. Physical appearance	4.40	0.64	0.63**	0.52**	0.12*	0.50**	0.18**	0.12*	0.45**	-	-
2. Job performance	4.29	0.54	0.41**	0.36**	0.10	0.39**	0.25**	0.13*	0.33**	0.26**	-

** $p < .01$; * $p < .05$.

group in order to identify the relationship between the nonverbal communication skills of school administrators and the job performance of teachers. The scale that was applied to the study group was retested in terms of its validity through the performance of the CFA.

According to the findings of the CFA, the fit indices of the model were examined and the χ^2/df ratio was calculated as 1.545 ($\chi^2=545.381$, $df= 406$, $p<0.000$). The fit indices for the model were established as follows: RMSEA= 0.044, GFI=0.886; AGFI= 859, CFI= 0.961, IFI= 0.961, RMR= 0.052.

According to these values, the significance level (p), χ^2/df , RMSEA, CFI, IFI, goodness of fit values were found to be perfect, while the RMR, GFI and AGFI goodness of fit values were found to be acceptable. The values regarding the model appear to be acceptable or perfect. The Cronbach Alpha value for the 29 items of the scale was calculated as 0.890.

A correlation analysis was performed to identify the relationship between the nonverbal communication skills of school administrators and the job performance of teachers. The mean and standard deviation values of the variables, and the relationship among the variables are presented in the Table 5.

According to the results presented in the Table 5 above, the general average for the nonverbal communication skills of school administrators (total scores) was calculated as $\bar{X}=3.86$, while the general average for the job performance of teachers (total scores) was calculated as $\bar{X}=4.29$. Of the nonverbal communication skills of school administrators, the average score obtained from the dimension of Chronemics ($\bar{X}=4.54$) is higher than other dimensions.

A review of the correlation coefficients among the variables shows that there is positively significant relationship between the nonverbal communication skills (total scores) and the job performance of teachers (total scores) ($r=0.41$, $p<0.01$).

Moreover, save for the tactile contact dimension, all the sub dimensions of nonverbal communication skills appear to be in a positively significant relationship between the job performance. The most statistically significant relationships between the nonverbal communication skills of school administrators and the job performance of teachers were established among the dimensions of paralanguage and job performance ($r =0.39$, $p<0.01$), artifacts and job performance ($r =0.36$,

$p < 0.01$), chronemics and job performance ($r = 0.33$, $p < 0.01$).

Conclusions

The present study aimed at developing a scale for identifying the nonverbal communication skills of school administrators in line with teachers' opinions and observing the relationship between the nonverbal communication skills of school administrators and the job performance of teachers through the scale thus was developed.

To this end, the literature in the field was reviewed and similar scales studied, and a pool of items created. After that, necessary corrections were made on the items in consultation with experts and the scale was made ready for the preliminary implementation. The exploratory factor analysis and confirmatory factor analysis were performed to identify the factor structure and validity of the scale respectively. Once those analyses were completed, the scale took its final form through reliability studies. The scale thus developed was applied to a new study group to study the relationship between the nonverbal communication skills of school administrators and the job performance of teachers.

The first version of the scale consisting of 42 items was applied to 109 teachers for item analysis. During the item analysis, it was found that the correlation values of the items number 38, 39, 40, 41 and 42 pertaining to the "silence" dimension of nonverbal communication and the item number 37 pertaining to the "time" dimension and the item number 4 pertaining to the "body language" dimension were fairly poor. Such items were removed from the scale in line with the opinions of the experts.

The 35 items, having passed the item analysis, was once again applied to a group of 220 teachers. The EFA was performed to establish the factor structure of the scale. As a result of the EFA, it was established that the five items (items number 3, 16, 17, 27 and 28) were overlapped and one item (item number 11) had a very low factor loading value. Such items were removed from the scale one by one and the scale was once again subjected to the exploratory factor analysis.

As a result of the exploratory factor analysis, it was established that the scale consisted of seven factors. In compliance with the item contents and literature, such factors were established as;

- (1) Artifacts
- (2) Tactile contact
- (3) Paralanguage
- (4) Proxemics
- (5) Knesics
- (6) Chronemics
- (7) Physical appearance.

It was observed that the factor loading values of the items with seven factors varied between 0.57 and 0.87. The total variance of the scale consisting of seven sub dimensions is 71.93. The CFA was applied for establishing the validity of the seven factor structure of the 29 item scale.

The χ^2/df ratio, calculated through the CFA, was found as 1.365. This value shows that the model has an acceptable goodness fit, in other words, the model is consistent with the real data. According to the goodness fit indices presented in the Table 3, the goodness fit values for a seven factor model meet the acceptable compliance criteria. It can be argued that the seven factor structure is a viable and valid model for a scale thus developed.

There is a number of studies conducted on the effects of nonverbal behaviors on students in an educational setting (Comadena et al., 2007; Martin and Mottet, 2011; McCroskey et al., 2006; Pribyl et al., 2004; Pogue and AhYun, 2006; Witt and Wheelless, 2001).

The nonverbal communication scales used in those studies are intended to identify the nonverbal communication skills of teachers in line with the opinions of students or their relationship with various different variables. However, considering the importance of nonverbal communication skills in interpersonal communication process, no scale has been developed so far to represent and assess the nonverbal communication skills of school administrators. Moreover, it is also established that the previously developed nonverbal communication skills scales are of single dimensional nature.

However, when the literature is reviewed, it is observed that nonverbal communication has multiple dimensions and such dimensions are not exactly covered by the existing scales. Being the most up-to-date one, NIS developed by Richmond et al. (2003) is a single dimensional scale, which omits the items pertaining to such nonverbal communication elements as physical appearance, artifacts and chronemics.

In this respect, it was thought necessary to develop a scale that would include many aspects of both school administrators and nonverbal communication. Developed in line with this aim, the "Nonverbal Communication Skills of School Administrators Scale" (NCSSAS) is capable of being used in the studies that are intended study the relationship between the nonverbal communication skills of school administrators and the job performance of teachers, and various different variables including their job motivation and satisfaction.

Having been tested for validity and reliability, the scale was applied to 289 teachers to identify the relationship between the nonverbal communication skills of school administrators and the job performance of teachers. The findings suggest that according to the opinions of teachers, the nonverbal communication skills are "most of

the time" statistically significant. This finding is partially in compliance with the finding of Uzun and Ayık (2016), who found the nonverbal communication skills of school administrators to be somewhat high. According to these findings, the teachers stated that their performance is fairly high in the interval of "always".

This finding concurs with the findings presented in the works of Koç et al. (2009); Cerit (2012) and Özdemir and Yirmibeş (2016) who found the performance of teachers to be high in general. According to these findings, there is a positively significant relationship between the nonverbal communication skills of school administrators (total scores) and the job performance of teachers (total scores).

Moreover, except for the tactile contact dimension, all the sub dimensions of the nonverbal communication skills of school administrators were found to have a positively significant relationship with the job performance of teachers. In the literature review, we have failed to find a research studying the relationship between the nonverbal communication skills of school administrators and the job performance of teachers.

However, there are nevertheless studies conducted so far that present the significant relationships between communication and the job performance of the employees (Khuong et al., 2016; Asamu, 2014; Dehghan and Ma'toufi, 2016). The findings of the study are, generally, in support of such studies which establish a positive relationship between communication and job performance.

Developed in line with this aim, the NCSSAS is capable of being used in the studies that are intended study the relationship between the nonverbal communication skills of school administrators and various different variables such as the organizational loyalty and organizational citizenship behaviors of teachers and their job motivation and job satisfaction. The scale thus developed is not exclusively applicable to school administrators, but it can also be applied to all executives and employees working in various different fields.

CONFLICT OF INTERESTS

The author has not declared any conflict of interests.

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Annex 1

NONVERBAL COMMUNICATION SKILLS OF SCHOOL ADMINISTRATORS SCALE	Never	Rarely	Sometimes	Often	Always
Please state your level of agreement to the following statements by ticking (X) the relevant box on a scale of one to five					
1- Our administrator gesticulates when talking to people.					
2- The facial expression of our administrator changes depending on his/her mood when talking to people.					
3- Our administrator's posture changes in line with his/her mood when talking to people.					
4- Our administrator's leg and foot movements change when talking to people.					
5- Our administrator is mindful of his/her accentuation when talking to people.					
6- Our administrator is mindful of his/her intonation when talking to people.					
7- Our administrator adjusts his/her vocal loudness when talking to people.					
8- Our administrator adjusts his/her vocal rhythm when talking to people.					
9- Our administrator is mindful of his/her physical appearance when communicating with people.					
10- Our administrator is mindful of his/her personal accessories.					
11- Our administrator is attentive to his/her personal grooming or make up.					
12- Our administrator is attentive to his/her attire.					
13- Our administrator embraces people when he/she welcomes them or bids them farewell.					
14- Our administrator touches people on the shoulder or arm when talking to them.					
15- Our administrator kisses people on the cheeks when he/she meets up with them.					
16- Our administrator feels the need to make physical contact when talking to people.					
17- Our administrator is mindful of the choice of furniture in his/her office.					
18- Our administrator is mindful of the choice of accessories in his/her office.					
19- Our administrator is mindful of the harmony of objects in his/her office.					
20- Our administrator is mindful of the colors of furniture, objects and accessories in his/her office.					
21- Our administrator is mindful of the choice of paintings in his/her office.					
22- Our administrator comes 0 to 35 cm closer to his/her family members when talking to them.					
23- Our administrator stands at an approximately 40 to 80 cm distance when talking to his/her close friends.					
24- Our administrator stands at an approximately 80 cm to 2 m distance when talking to the people he/she has just met.					
25- Our administrator stands at a distance of 2 m or above from people in general public.					
26- Our administrator is attentive to the punctuality of his/her appointments.					
27- Our administrator is mindful of the amount of time he/she spends when talking to people.					
28- Our administrator is diligent about his/her working hours.					
29- Our administrator devotes his/her time to the meetings in accordance with the "degree of importance" of such meetings.					

The dimensions and items created in the scale: (1) Manipulable objects and environmental features (Artifacts) dimension: 17-18-19-20-21; (2) Tactile Contact dimension: 13-14-15-16; (3) Paralanguage dimension: 5-6-7-8; (4) Proxemics dimension: 22-23-24-25; (5) Knesics dimension: 1-2-3-4; (6) Chronemics dimension: 26-27-28-29; (7) Physical Appearance dimension: As well as consisting of the items number 9-10-11-12

Full Length Research Paper

The effect of learning cycle constructivist-based approach on students' academic achievement and attitude towards chemistry in secondary schools in north-eastern part of Nigeria

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This study investigated the effect of learning cycle constructivist-based approach on secondary schools students' academic achievement and their attitude towards chemistry. The design used was a pre-test, post-test non randomized control group quasi experimental research design. The design consisted of two instructional groups (learning cycle group and lecture group), two attitudes (positive and negative) and repeated testing (pre-test and post-test). The samples of the study comprised 120 students from four mixed senior secondary school class II (SS II) randomly drawn from the population. The instruments used in collecting data were chemistry achievement test (CAT) and chemistry attitude scale (CAS). The data were analyzed using mean, standard deviation and analysis of covariance (ANCOVA) used to compare the positive and negative attitude with the experimental group on academic achievement. The findings of the study indicated that learning cycle had a significant effect on students' achievement in chemistry, students taught with learning cycle significantly achieved better in chemistry Post-test than those taught with lecture method, and a non-significant difference existed in academic achievement between students with positive and negative attitude after treatment. It was concluded that learning cycle method seems an appropriate instructional model that could be used to solve the problems of science teaching and learning since it enhances students' achievement, facilitates learning and its effectiveness is not limited by attitude.

Key words: 5E Learning cycle, constructivist approach, academic achievement, attitude.

INTRODUCTION

Chemistry is taught in most schools as an abstract subject without much emphasis on practical experiences (Ghassan, 2007). This has resulted to students' low acquisition of science processing skills which has

become more evident in the mass failure of students in the subject in public examinations. All the questions asked to test the knowledge of chemistry students' in practical skills require that they demonstrate one form of

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process skill or the other. The inability of students to carry out these activities properly results in low scores in the test of practical knowledge.

The shift from the teacher-centered method of teaching science to student-centered activity based method encourages and develops in the child the spirit of inquiry. The student-centered activity method as opined by Akinbobola (2006) attempts to make students fully aware as well as understand the ways scientists work and also equip and prepare them for their possible careers in science, chemistry in particular, and process skills development.

Several studies in the chemistry education literature (Jack, 2005; Obomanu, 2012; Njoku and Nzewi, 2015; Uchegbu et al., 2016) dealt with the learning difficulties of basic concepts of chemistry at schools and some reasons given included poor teaching methodologies. Concepts formed when the ideas or thoughts are developed based on common properties of objects or events by the process of abstraction. Consequently, there is a great need to help improve chemistry students' perceived learning difficulties of chemical concepts not just for them to sail through SSCE/GCE examinations, but also for them to be aware and be appreciative of the contributions they can make to the country's development. Available evidence from West African Examination Council and some science educationist (WAEC, 2014, 2015; Jack, 2005; Oyedokun, 2002) indicates student's poor academic achievement in chemistry. Therefore, we need today teaching and learning strategies that provide us with a wide range and advanced educational potential that will help our students to enrich their information, develop their mental abilities, acquire science process skills and train them to be innovative and novel.

Oriented to the predetermined goals and aimed to earn desirable behavior, teaching activities usually take place in the institutes of educations. Teachers therefore need to recognize learning styles based on students' learning outcomes as a basis for the development of an effective, efficient and innovative teaching and learning strategies (Healey and Jenkins, 2000). From this point of view, the researcher opined that learning cycle if used as an instructional method for teaching chemistry would be a suitable alternative for the lecture method which has dominated the science classrooms in Nigeria with the intention to improve students' achievement.

Learning cycle constructivist-based approach which is an inquiry-based teaching model is useful to teachers in designing curriculum materials and instructional strategies in science. The model is derived from constructivist ideas of the nature of science, and the developmental theory of Jean Piaget (Piaget, 1970). Constructivism is an epistemology, a theory of knowledge used to explain how we know what we know. A constructivist epistemology is useful to teachers if used

as a referent; that is, as a way to make sense of what they see, think, and do. And constructivism stresses the importance of considering what is already in the learner's mind as a place to initiate instruction. Learning is regarded as an active process whereby students construct personal meaning of the subject matter through their interactions with the physical and social world. It is the student who makes sense out of the experiences. The learning process is facilitated by the skilled teacher who engages students in thinking, questioning, testing ideas, explaining, and representing ideas. The teacher should have good subject-matter knowledge and be flexible in their teaching methods. Constructivism also concentrates on building knowledge and claims that meaning remains subjective by the cognitive organ of the learner and is not transferred from teacher to learner. It is also interested in arousing the learner's thinking and makes him/her active, interactive and positive during the learning process.

The 5E learning cycle based on constructivist approach help increases students' critical thinking skills and also targets at the discovery and the students' acquaintance with previous knowledge of new concepts. 5E learning cycle as opined by Wilder and Shuttleworth (2005) motivates students through several phases of learning, to explore a subject, to have a given definition for their experiences, to obtain more detailed information about their learning and to evaluate it. Learning using the learning cycle method is an active cognitive process, in which the student goes through various, explorative educational experiences which enable him to explore the knowledge intended to be taught. The learner engages in a mental activity represented by the re-organization, re-arrangement and alternation that the learner introduces to the learning material.

Consequently, learning using the learning cycle strategy is indeed a meaningful learning that increases learner's educational achievement. Students do a mental activity to solve a number of problems in the process where the 5E learning cycles model is used. Working in pairs or in groups of three, students ask questions, and they share their opinions in response to explanations offered as answers to the questions. Students' answers to open-ended questions help to uncover their misconceptions. Recording the data gathered for the whole class by using all facilities of technology with experiments and observations assures that students make a comparison of their data with others' by going through a mental process and that they inquire the aspects that their data agree and disagree with others' data. Thus, students' scientific process skills begin to develop. Besides, it also becomes possible for students to use the materials they are familiar with, that is to say, to associate their new experiences with their previous experiences and to structure the knowledge (Colburn, 2007).

More also, Campbell (2000) observed that 5E learning cycle is one of the complete constructive models used in classrooms and it is a learning that is research-based or brain-storming where students think creatively through higher order thinking skills or critical thinking skills. The learning cycle approach facilitates learning and creates beneficial opportunities for students while learning (Lorsbach, 2006). Learning cycle strategy is also concerned with the entire content to be learnt and with the cognitive structures the learner has and also deals with the selection and organization of content experiences in order to facilitate the material to be learnt within learner's cognitive structures and create new knowledge structures to bring about cognitive development. Furthermore, this method is concerned with increasing learner's motivation towards learning, a thing that increases achievement and stresses the importance of practice, which helps to learn actively in order to acquire science process skills.

The 5E learning cycle model assures that students are active in classes, they have the opportunity to research and analyze, and that they reach knowledge by creating discussion environments and by continuously inquiring (Gunduz-Bahadir, 2012). Learning cycle also helps the learner to evaluate themselves, and to reach a formula of what he understood of relationships that connect concepts, details, models and applications. This model is an opposite of the traditional method which deals only with the learning material and gives it an absolute importance in the teaching and learning process, where the teacher plays a fundamental role; and this will eventually lead to a memorizing learning without observing individual differences amongst learners.

The learning cycle used in this study was hinged on Bybee's (1997) 5E learning model (Engagement, Exploration, Explanation, Elaboration and Evaluation). According to Bybee (1997), the foundation of this model was affected by works of German philosopher Freidrich Herbart. Furthermore, in his view, this model is based on the ground of John Dewey and Jean Piaget. As a very frequently used model in constructivist learning approach, 5E learning cycle model's name comes from the number of its phases and the initials of each phase. These five phases are: Engagement, Exploration, Explanation, Elaboration and Evaluation. The description of each phase of the learning cycle is hinged on the works of Kilavuz (2005), Wilder and Shuttleworth (2005), Moyer et al. (2007) and Ahmed (2012). The descriptions of the events that take place at each stage are discussed as the following.

Engagement

Engagement stage is designed to help students understand the learning task and make connections

between learning experiences. The purpose of this phase is to focus students' attention on the topic. In this phase, past experiences are connecting with actual experiences. The basis of work for upcoming activities is organized. In this stage teacher create interest and generate curiosity in the topic of study. For this reason activities are made. These activities help students to make connections with the previous knowledge. Teacher raises questions and elicits responses from students that will give you an idea of what they already know. Teacher has also a good opportunity to identify misconceptions in students' understanding.

Exploration

In exploration stage, students should also be given opportunities to work together without direct instruction from the teacher. Students get directly involved with phenomena. The teacher's role in the exploration phase is that of guide, coach and facilitator. Students should be puzzled. This is the opportunity for students to test predictions and hypotheses and/or form new ones, try alternatives and discuss them with peers, record observations and ideas and suspend judgment.

Explanation

The explanation phase is a teacher-centred phase in 5E model, because teachers become active for correcting mistakes and completing the missing parts in students' results. Teachers may choose lecture method or may use another interesting method like showing a film or a video, making a demonstration or giving an activity which leads students to define their work or to explain their results. In this phase, teachers give formal definitions and scientific explanations. Furthermore, by giving explanations in basic knowledge level to students, teachers, whenever possible, help them to unify together their experiences, to explain their results and to form new concepts (Bybee, 1997). In this phase, mistakes noted in students' during lesson can be corrected before the next phase.

Elaboration

In the "Elaborate" stage, students expand on what they have learned and apply their new found knowledge to a different situation. During "Elaboration", students should also apply concepts and skills in new (but similar) situations and use formal labels and definitions. Students expand on the concepts they have learned, make connections to other related concepts, and apply their understanding to the real world around them. This phase often involves experimental inquiry; investigate projects,

problem solving and decision making. The teacher may decide to recycle through different phases of the 5E learning cycle to improve students' understanding or move on to new science lessons. Working in groups also in this phase, students are close to end up the asked problem. The groups present and explain their final situations. The elaborate phase is important because the new learned is corroborated and its permanence is supported.

Evaluation

The learning cycle provides opportunities for the instructor to continually observe students' learning and to monitor their progress using questioning techniques and discussions. More formal evaluation can be conducted at this stage. The assessment should be aligned with the styles and content of the learning experience. The multiple choice quizzes were designed and used primarily for assessing changes in student understanding as part of the evaluation of the materials. Evaluation should take place at all points along the continuum of the instructional process. Students should assess their own learning. Teacher asks open-ended questions and look for answers that use observation, evidence, and previously accepted explanations. Students are also asked questions that would encourage future investigations. This phase reveals how students constructed scientific knowledge and they generalize or relate it to other situations (Wilder and Shuttleworth, 2005).

Literature on the effects of 5E learning cycle on academic achievement and attitude are scanty and limited. Studies by Whilder and Shuttleworth (2004) and Ceylan (2008) found significant differences in achievement between the experimental (treatment) and control groups in favor of the experimental group. Studies by Ajaja (2013), Ajaja and Eravwoke (2012), Pulat (2009), Cardak et al. (2008), Baser (2008), Nuhoglu and Yalcin (2006), Akar (2005), Whilder and Shuttleworth (2004) and Lee (2003) found that students' achievement improved significantly after the usage of 5E learning cycle during classroom instructions. Specifically, Lee (2003) found that the students acquired knowledge about plants in daily life easier and understood the concepts better when taught with learning cycle.

The results of empirical reviewed literatures (Ahmed, 2012; Kilavuz, 2005) revealed the effectiveness of the learning cycle on the educational results like achievement, scientific attitudes and thinking skills in all levels. These appeared to be the fundamental objectives of the scientific education, and had made great strides in the educational field as an effective teaching strategy due to its harmony with the nature of science, attainment of scientific knowledge, acquisition of science and thinking skills; and also because it attaches great importance to

the learner.

Over the years, the teaching of science and particularly chemistry has been based on lecture method. The results of chemistry students as noted in the chief examiners report as measured by their grades in the senior school certificate examinations have not shown any significant improvement (WAEC, 2012, 2013, 2014). This development indicates an instructional method failure and ineffectiveness which calls for a more effective, efficient and innovative instructional strategy such as learning cycle. Furthermore, the learner's formation of meanings is an active psychological process which demands mental effort. It also concentrates on the learner and his/her activity during learning, and emphasizes meaningful learning based on understanding through the students' active role and effective participation in the activities they do, in order to build their concepts and scientific knowledge. For this reason, the present study aimed to examine the effectiveness of "non-metals concepts" instruction based on 5E learning cycle model and attitudes toward science as a school subject. Students' attitudes, feelings and perceptions of science are also important for science achievement. Understanding the non-metals such as hydrogen, chlorine, oxygen nitrogen, etc., in the periodic table are critical for learners since these topics serve as the foundation for understanding gases which are very useful to man in her immediate environment through a purposeful activity.

This instructional method failure and ineffectiveness accompanied with students' poor academic performance and science process skills acquisition is a gap that exists in literature in chemistry education in the Nigeria and north-east in particular. This gap needs to be filled to enable researchers and science teachers fully appreciate the roles and effects of this instructional strategy in the teaching and learning of sciences. The statement of the problem therefore is, will the application of learning cycle method in teaching and learning of chemistry produce similar effect on students' achievement, create positive attitude in students' towards chemistry, promote science process skills acquisition, and help eradicate students learning problems in Nigeria? Therefore, this study aimed to investigate the effects of 5E Learning Cycle based on the constructive approach on students' achievement and attitudes towards chemistry as a subject.

Research questions

To guide this study, the following research questions were raised and answered:

- (1) Is there any difference in chemistry achievement among students taught with learning cycle and lecture methods?
- (2) Is there any difference in chemistry achievement

between students' with positive and negative attitude taught with learning cycle and lecture methods?

MATERIALS AND METHODS

Research design

The design used for the study was a pre-test, post-test non randomized control group quasi experimental research design which consisted of two instructional groups (learning cycle group and lecture group), two attitudes (positive and negative) and repeated testing (pre-test and post-test). The independent variables were two different types of instructional approaches; instruction based on 5E learning cycle model and lecture method (traditionally designed chemistry instruction) while the dependent variables were students' understanding of chemistry concepts (non-metals) and their attitudes toward chemistry as a school subject.

Samples and sampling technique

The samples consisted of four mixed senior secondary schools, four chemistry education graduate teachers who have taught chemistry for at least five years, four senior secondary school class II (SS II) science classes, that is, one class per school and 30 students (an average age of 16 years) drawn from 4 public secondary schools selected from the north-eastern part of Nigeria with a total sample size of 120 students. The selected schools for the study which was done randomly using balloting were first considered for selection after due consideration of some parameters which included a well-equipped chemistry laboratory as well as trained and experienced chemistry teachers. So, schools without laboratories were isolated from the study.

Instruments

Three major instruments were used for the study. The instruments included: (i) A four weeks instructional unit on non-metals (Hydrogen, Oxygen, Chlorine and Nitrogen) which is an SS II (11th grade) topic in chemistry syllabus; (ii) chemistry achievement test (CAT) which consisted of 30 multiple choice test items constructed by the researcher and drawn from the 4 weeks instructional unit; and (iii) chemistry attitude scale (CAS).

Chemistry achievement test (CAT)

This test developed by the researcher. The test contained 30 multiple choice questions. Each question had one correct answer and four distracters. The items used in the test were related to non-metals concepts. During construction of items, care was taken to eliminate any extraneous factors that might prevent the students from responding and the items that measure achievement of the specific learning outcomes were used. During the developmental stage of the test, the instructional objectives of non-metals concepts were determined to find out whether the students achieved the behavioral objectives of the course and present study. The items in the test were chosen according to the instructional objectives and were designed in such a manner that each of them examines students' knowledge of non-metals (hydrogen, nitrogen, oxygen and chlorine) concept. This test was administered to students in both groups as a pre-test to ascertain students' understanding of non-metals concepts at the beginning of the instruction. It was also

administered to both groups as a post-test to compare the effects of two instructions (learning cycle method and lecture method) on understanding of non-metal concepts.

Chemistry attitude scale (CAS)

This scale was developed by the researcher to measure students' attitudes toward chemistry as a school subject. This instrument consisted of 30 items in 4 point Likert type scale (strongly agree, agree, strongly disagree, disagree). This test was administered to all students in both groups as a pre-test and post-test.

Validity of instrument

Expert opinion was obtained from chemistry educators and science education lecturers so as to attain content validity. The items were assessed by a group of experts in science education and chemistry and for the appropriateness of the items for the purpose of the investigation and representativeness of the non-metals unit of chemistry course. The classroom teachers from the schools used for this study also examined the test items to check whether they are appropriate to the instructional objectives or not. The required modifications were made in accordance with experts' recommendations and after reliability analyses, item discrimination and item difficulty indices. In consequence, Cronbach Alpha internal coefficient was calculated as 0.78 for 30-question CAT test. For each stage of the questions, the correct answers given by students were coded as "1" and incorrect answers as "0". If students' answered one of the stages correctly and the other incorrectly, again they received "0" for their incorrect answer.

Reliability of instrument

The instruments' reliability was determined by adopting the Kuder-Richardson 21 formula. This involved the management of the CAS and 30-item 4-Likert scale questionnaire and CAT with 30 items for 45 SSII chemistry students, who were not part of the study. The data was analyzed using Cronbach Alpha and Kuder-Richardson 21 formula, a reliability index with reliability coefficients of 0.75 and 0.78 for CAS and CAT, respectively; which proved that the instrument was reliable and thus suitable for the study. The CAS was used in grouping the students into positive and negative attitude; students whose mean scores were > 2.5 as positive while < 2.4 as negative.

Treatment

The treatment used in this study was modified from that of Bybee (1997) and Kilavuz (2005). This study was conducted approximately four weeks during the 2015/2016 session with students drawn from four senior secondary schools in Jalingo. 120 SS II (11th grade) students (60 males and 60 females) with an average age of 16 years from four classes of a chemistry course were used in the study. The unit "non-metals" used in this study was an SS II topic in the Nigerian chemistry curriculum which included abstract and theoretical concepts; for this reason, students have difficulty in understanding the concepts. So, while teaching non-metals concepts, the teachers made the scientific concepts as concrete as possible. Children's prior knowledge of phenomena is an important part of how they come to understand school science; therefore, the teachers were also more sensitive to children's prior

knowledge before instructions.

There are two groups in the study. One of the classes was assigned as the experimental group applied 5E learning cycle model and the other class was assigned as the control group applied lecture method (traditionally designed instruction). The instructional methods were randomly assigned to the classes. Both of the groups were instructed by the same science teacher and students in two groups were exposed to same content of the chemistry course for the same duration. The classroom instruction of the groups was regularly scheduled as three times per week in which each teaching session lasted 40 minutes. The topics related with non-metals concepts were covered as a part of the regular school curriculum.

The learning cycle approach emphasizes the explanation and investigation of phenomena, the use of evidence to back up conclusions and the designing of experiments while the traditional approaches emphasize the development of skills and techniques, the receiving of information, and the knowing of the outcome of an experiment before doing it. In order to avoid bias that might distort the result of the study, the researcher ensured that students in experimental group did not interact with students in control group; the teacher who applied the treatment was not biased; the tests were administered under standard condition; and all the students gave accurate and sincere responses to all items in the instruments used in the study.

The teachers (research assistants) from the four schools who led the lessons were trained for a period of one week about the implementation of the constructivist strategy before the treatment. In order to verify the treatment, the researcher observed instructions in both groups randomly. This study was done using a pre-test and post-test control group design with CAT and CAS, which were distributed to measure students' attitudes toward chemistry as a school subject. In addition to this to avoid bias, at the beginning of the treatment all students were oriented and tested on their practical skills.

In the control group, lecture method (traditionally designed instruction) was administered as regular chemistry courses because it was teacher-centered that is the teacher transferred their thoughts and meanings to the passive students. The teacher provided information without considering students' prior knowledge and checked whether students have acquired it or not. The students were instructed with traditionally designed chemistry texts. During the classroom instruction, the teacher used lecture and discussion methods to teach science subjects where the students listened to their teacher, took notes, studied their textbooks and completed the worksheets. Each worksheet consisted of one or two pages that included questions to be answered, tables to be completed or space for students to make sketches. The teacher moved round the class during the lesson, answered some questions and made suggestions when needed. Worksheets were corrected and scored in the classroom. Then the students investigated their sheets after correction. The students were not given any opportunity to develop their thinking, reasoning and communication skills. They only received the teacher's instruction while lecturing. They were not given opportunity to use problem-solving skills in other situations. Since the teacher instructed the lecture, students in control group did not have so many chances to discuss or share ideas with each other. There was no interaction between teacher and students, and students and students in control group. They did not become more confident in their understanding of science.

Student in the experimental group were instructed with the 5E learning cycle model based on Bybee's (1997). According to this strategy, the five phases were arranged in a manner that meaningful learning occurs for the non-metals concepts. Before beginning the instruction the teachers had one week training on

usage of 5E learning cycle. The teacher divided the classroom into groups at the beginning of the instruction so that interaction between the students was maximized. The learning cycle constructivist-based approach adopted for the study was the Bybee's (1997) five steps: Engagement, Exploration, Explanation, Elaboration and Evaluation.

The instruction began with the "Engagement" part. As a first phase (engagement), the teacher made demonstrations and asked students some questions at the beginning of the instruction in order to create interest and generate curiosity in the topic of study, raise questions and elicit responses from students that will give you an idea of what they already know. At the beginning of the treatment, the teacher created groups of four or five student in order to maximize the interaction in class. The teacher made a demonstration by inserting a lighted splinter into the gas jar containing a gas. The students observed that the gas immediately burns with a pop sound. According to students' observations, the teacher asked a question to the class: "How would you confirm that a given gas is hydrogen, oxygen nitrogen or chlorine? Then, the students were given opportunity to think 5 to 7 minutes about questions individually and then share it with their group. Instead of interfering student's discussions about questions, teacher helped students by raising questions to find their answers. Teacher did not give answers of the questions in this phase. Then, the teacher informed the students that they will engage in a laboratory activity to help them test their answers. In this stage, the purpose of the teacher is to create interest and generate curiosity in the topic of study, raise questions and elicit responses from students that will give you an idea of what they already know. So, students had an idea about the focus of the lesson and what they would be doing by the end of this phase. The students were introduced to the topic.

As a second phase (exploration), students were allowed to discuss the question in groups by using their previous knowledge related to non-metals concepts. During these discussions, the teacher let the student manipulate materials to actively explore concepts, processes or skills. The teacher gave enough time to the students to discuss the questions with their friends. The teacher also let them write their answers to their notebooks. During the discussion, the teacher did not interfere with the students. The facilitator (teacher) observed and listened to students as they interact. After the students discussed, each group gave a common answer to the teacher. So, the teacher had an opportunity to view the students' previous ideas. The teacher gave some solutions used in daily life and how they would confirm that a given gas is hydrogen, nitrogen, oxygen or chlorine to each group. The students tried to distinguish these non-metals and they discussed the question the teacher asked in the previous step with peers. During the discussion, they had opportunity to express their ideas and saw their peers' thoughts. Each group was supposed to record their observations and ideas and give a common answer to the teacher.

In the third phase (explanation), this was based on the students' answers; the teacher explained the concept using students' previous experiences, and then presented scientifically correct explanation by using analogies and examples from daily life in order to make concepts more concrete. The teacher listened to each group's answer and explained the concept using students' previous experiences. The teacher used examples from daily life in order to make concepts more concrete. For the answer of the question asked in "engagement" phase, they explained the test of each of the non-metals and emphasizing the differences between their physical and chemical properties. At the end of this part, students were ask to summarize what they have observed about non-metals (hydrogen, nitrogen, oxygen and chlorine) both in their confirmatory test, physical and chemical properties so that they can compare them. Teacher carefully developed a specific questioning sequence that related to the new knowledge that identified the purpose of the

lesson. The sequence of questions in this portion of the lesson was most important; moving from concrete to abstract and from known to unknown. The teacher also guided children's exploration of non-metals concepts while their thinking skills were probed and feedback provided.

In the elaboration part, the fourth phase of cycle, students worked in groups again and in laboratory. The purpose of the teacher was to extend conceptual understanding, practice desired skills, and deepen understanding. The purpose of this step is extending conceptual understanding, practice desired skills, deepen understanding. Students work in groups again and in laboratory. Teacher gave hydrogen, nitrogen, oxygen and chlorine solutions and other necessary materials and wanted students to compare them.

In the fifth phase of the cycle which is the last phase called evaluation, the teacher encouraged students to assess understanding and abilities; and evaluated their learning. Assessment occurred at all points along the instruction. Before presenting each new concept, the teacher asked questions which students could answer by using their previous knowledge such as How would you confirm that a given gas is (i) hydrogen, (ii) nitrogen, (iii) oxygen, and (iv) chlorine? At the end of the sessions, all the students always got the answers of the questions. The teacher also asked questions to the students during the lesson and observed them through discussions and hands-on activities. Moreover, the students are asked several open-ended and multiple-choice questions at the end of the instruction. The students had enough time to think about the answers of the questions. Later, the answers of the questions were discussed in the classroom. Evaluation is made not only at the end of the course but in the whole process (Bybee et al., 2006; Ozturk, 2013; Wilder and Shuttleworth, 2005).

Experimental group: 5E Learning cycle based on constructivist approach

Although different methods of teaching were developed to implement constructivist-based learning, science educators usually prefer the 5E instructional model (Bybee, 1997). Therefore, the 5E instructional model, a modification of learning cycle, that is, constructivist-based science teaching was used in this study (Bybee, 1997; Bybee et al., 2006).

Control group: Lecture method (Traditional Teaching Method)

The control group used lecture method (traditionally teaching method), which was teacher-centered that is the teacher transferred their thoughts and meanings to the passive students. The teacher provided information without considering students' prior knowledge and checked whether students have acquired it or not. During instruction, students listened to their teacher, took notes, studied their textbooks and completed the worksheets. The students were not given any opportunity to develop their thinking, reasoning and communication skills. They only received the teacher's instructions while lecturing. They were not given opportunity to use problem-solving skills in other situations. Since the teacher instructed the lecture, students in control group did not have so many chances to discuss or share ideas with each other. There was no interaction between teacher and students and students and students in control group.

Analysis of data

In this study, means and standard deviations of the pre-test and

post-test scores for each experimental and control groups were used to answer the research questions. To verify the difference between the two means in the post-test for the instructional approaches and attitude of students towards chemistry were statistically significant, the researcher used Analysis of Covariance (ANCOVA) at significance level of 0.05. The covariate variable was pre-test. The researcher also checked to ensure that the prior conditions for statistical analysis (such as normality distribution, parallelism) were met.

RESULTS

Answering research question one

Is there any difference in chemistry achievement among students taught with learning cycle and lecture method?

To answer this research question, the means and standard deviations of the pre-test and post-test scores for each experimental and control groups were calculated as shown Table 1.

Table 1 showed that the mean of the experimental group was 47.34 and that of the control group was 39.88. The result of the analysis presented in the Table 1 therefore showed that there was a significant difference between the post-test mean scores of the students taught by Learning Cycle and those taught by Lecture Method with respect to the non-metals concepts. To verify the difference between the two means in the post-test was statistically significant, the researcher used ANCOVA and Table 2 shows the results for the covariance analysis.

Testing hypothesis one

There is no significant difference in chemistry achievement among students taught with learning cycle and lecture methods.

As shown in Table 2, the calculated probability p-value 0.000 of main effect (Instructional approach) is less than the alpha level 0.05 and is therefore statistically significant at a level lower than at 0.05; that is, at 0.05 level with significance. It could also be noted that the difference was in favour of the experimental group which were taught with 5E learning cycle approach as their level of adjustment improved in a statistically significant way.

Answering research question two

Is there any difference in chemistry achievement between students' with positive and negative attitude taught with learning cycle and lecture methods?

To answer this research question, the means and standard deviations of the pre-test and post-test scores for each experimental and control groups were calculated as shown in Table 3.

Table 3 showed that the mean of the experimental

Table 1. Mean and standard deviation of students' pre-test and post-test achievement according to Instructional strategies (Learning Cycle and Lecture method).

Group	N	Mean	Standard deviation	Mean	Standard deviation
		Pre-test	Pre-test	Post-test	Post-test
Experimental group	60	48.25	4.71	47.34	3.80
Control group	60	39.00	4.54	39.88	-3.67

Table 2. Summary of Analysis of Covariance (ANCOVA) of students' academic achievement scores according to treatment (5E Learning Cycle) and control group (lecture method).

Variable	Source of variance	Sum of squares	Df	Mean squares	F	Sig. $p \leq .05$	Decision
Instructional approach	Covariate (Pre-test)	3416.27	1	3416.27	76.39	0.000	-
	Main effect	1532.11	1	1532.11	34.26	0.000*	Rejected
	Model	4948.39	2	2474.19	55.33	0.000	-
	Error	4963.89	117	44.72	-	-	-
	Total	9912.28	119	87.72	-	-	-

Main effect (Instructional approach); Model (Learning cycle and Lecture method). *Significant at $p \leq 0.05$.

Table 3. Mean and standard deviation of students' pre-test and post-test achievement according to Attitude (positive and negative) toward chemistry.

Group	N	Mean	Standard deviation	Mean	Standard deviation
		Pre-test	Pre-test	Post-test	Post-test
Positive attitude	50	45.43	1.89	44.79	1.25
Negative attitude	70	42.44	1.10	42.81	-0.73

group was 44.79 and that of the control group was 42.81. To verify the difference between the two means in the post-test was statistically significant, the researcher used ANCOVA and Table 4 shows the results for the covariance analysis.

Testing hypothesis two

There is no significant difference in chemistry achievement between students with positive and negative attitude taught with learning cycle and lecture method.

As shown in Table 4, the calculated probability p-value 0.183 of main effect (Attitude) is less than the alpha level 0.05. The result showed that differences between the means did not reach the level of statistical significance as the value of statistical p (p-value) was not significant at a level lower than 0.05. Hence, there was no significant difference in chemistry achievement between students' with positive and negative attitude taught with instructional approaches at 0.05 levels with no significance. Students in both groups showed statistically

equal development in attitude toward chemistry as a school subject.

DISCUSSIONS

This study was mainly aimed to compare the effectiveness of the instruction based on the 5E learning cycle and lecture method (traditional teaching instruction) on students' understanding of chemistry concepts. According to the descriptive statistics given from the results from the findings in the study as shown in Tables 1 and 2, it can be concluded that the instruction based on the 5E learning cycle model caused a significantly better acquisition of scientific conceptions related to non-metals concepts than lecture method. Findings from the results showed that students exposed to learning cycle performed significantly better than those that used the conventional lecture method. This is because students in the learning cycle group used a student-activity oriented approach where the teacher was there just as a guide but the lecture group was a teacher-centered approach where

Table 4. Summary of Analysis of Covariance (ANCOVA) of students' academic achievement scores according to attitude (positive and negative) towards chemistry.

Variable	Source of variance	Sum of squares	Df	Mean squares	F	Sig. $p \leq .05$	Decision
Attitude	Covariate (Pre-test)	3416.27	1	3416.27	59.32	0.000	-
	Main effect	103.21	1	103.21	1.79	0.183*	Not rejected
	Model	3519.48	2	1759.74	30.56	0.000	-
	Error	6392.80	117	57.59.59	-	-	-
	Total	9912.28	119	87.72	-	-	-

Main effect (Attitude), Model (positive and negative). *Significant at $p \leq 0.05$.

learning was not really matter to the students, making them unenthusiastic in the subject-matter.

On the other hand, in the control group where lecture method was used, it can be concluded that lecture method or traditional instruction is less effective than instruction based on 5E learning cycle model. This is because the traditional instruction was teacher-centered that is the teacher transferred their thoughts and meanings to the passive students. This might be caused the difference in the concept test scores in traditional instruction (lecture method) versus 5E learning cycle instruction. So, it can be seen that the experimental group in this study were provided for meaningful learning to be occur. After the results are assessed, it is seen that there is a significant mean difference between the experimental and control group. Both groups of students increased their understanding in the non-metals concept as expected, but the improvement is greater in the experimental group.

The result from Tables 1 and 2 supports different literatures from science educationist which indicated a general improvement on students' academic achievement taught with learning cycle. Studies by Pulat (2009), Cardak et al. (2008), Baser (2008), Nuhoglu and Yalcin (2006), Akar (2005), Whilder and Shuttleworth (2004), and Lee (2003) found that students' achievement improves after applying learning cycle approach which they opined enhances a long lasting knowledge and understanding of scientific concepts. They further stated that students are also more capable of applying their knowledge in other subject-related areas outside the original context. The result from this study also supported the findings by Ajaja and Eravwoke (2012) who observed that there was a significant effect on students' achievement in biology and chemistry that used learning cycle which made the understanding and internalization of the concepts taught easier. More also, Pulat (2009) stated clearly that learning cycle was student-activities based, where the teacher created interest and curiosity to draw the students attention and to excite them in the phase of engagement, provided opportunities for students to make them discover the topic, and create a

situation of "need to know" setting the phase for explanation. Pulat (2009) also noted that the teacher ought to encourage the students to test the presented situations further in the topic in elaboration phase, also to test their knowledge and skill in the phase of evaluation. In this way, the students can be engaged in a more meaningful and permanent learning.

The findings as seen in Tables 3 and 4 implied a non-significant difference in academic achievement between students having positive and negative attitude towards chemistry as a school subject. The treatments developed similar attitude toward science. The reason why no significant difference was found in this study might be due to the fact that students have not shown more positive attitude toward science from instruction based on 5E learning cycle model may be that instructional time using this technique was not sufficient for the students to adapt and be effective in a new technique. In order to have more positive attitude, 5E learning cycle model can be used throughout the whole science concepts. Similar results were obtained in studies concerning the effects of learning cycle's model on students' attitudes (Kilavuz, 2005; Gonen et al., 2006; Nuhoglu and Yalcin, 2006; Koseoglu and Tumay, 2010; Ahmed, 2012). The results revealed the effectiveness of the learning cycle on the educational results like achievement, scientific attitudes and thinking skills in all levels, which are fundamental objectives of the scientific (chemistry) education, and which appeared to have made great strides in the educational field as an effective teaching strategy due to its harmony with the nature of science and that the subject is a scientific knowledge and research and thinking method, and also because it attaches great importance to the learner.

In short, the research gain in terms of chemistry education in Nigeria as noted in this study showed that 5E learning cycle model is an effective teaching strategy. On the contrary, traditional instruction does not seem effective in developing students' understanding of non-metals concepts. 5E learning cycle model can provide teachers with many insights into how students can learn about and appreciate science. By using this teaching

strategy, there could be better understanding of non-metals concepts because it helped in improving students' achievement and also construct their views about science and develop thinking ability. Learning cycle also advances questioning/thinking skills, activates relevant prior knowledge and promotes meaningful learning. In addition, this also helped students to have more positive attitudes towards chemistry as a school subject.

Learning cycle model is also an educational model that could be used to readdress the major problems in teaching scientific knowledge. Learning cycle constructive-based approach enhance the performance of chemistry students as they are motivated and understand the concepts better through activity-oriented classroom; avoiding learning from being abstract but concrete, thereby eradicating learning difficulties. With a strong support of empirical studies (Akar, 2005; Kilavuz, 2005; Ahmed, 2012) and findings from this present study; its application or usage helped to facilitate students' effective learning and help to organize their knowledge in a meaningful way. This study therefore used the 5E learning cycle method to enable students to understand the non-metals concepts through acquiring process of knowledge acquisition, developed problem solving skills, researched knowledge within life, developed process skills, and acquired attitudes that enabled them to generalize the knowledge (Wilder and Shuttleworth, 2005).

Conclusions

The 5E learning cycle model based instruction caused a significantly better acquisition of scientific conceptions related to non-metals concepts than lecture method. The pre-test and post-test scores of CAT also showed that both 5E Learning Cycle and lecture method group's achievement was increased. Thus, it can be concluded that there was positive effect in understanding of non-metals concepts which was statistically significant. Consequently, it may be said that the students in the experimental group understood non-metals concepts better than the students in the control group, and that they had fewer misconceptions in this matter. The pre-test and post-test scores of CAT showed that both 5E Learning Cycle and lecture method group's achievement was increased. Thus, it can be concluded that there was positive effect in understanding of non-metals concepts which was statistically significant. However, the increase in learning cycle group was higher.

This study also investigated the effect of treatment; 5E learning cycle based instruction and lecture method (traditional instruction), on students' attitudes towards chemistry as a school subject. There was no significant mean difference between the students taught with instruction based on constructivist approach and traditionally teaching method with respect to their

attitudes toward chemistry as a school subject although instruction based on 5E learning cycle model, focused on students' ideas, encouraged students to think about situations. The treatments developed similar attitude toward science. 5E learning cycle based instruction also helped in facilitating students' understanding of the concept non-metals, contributed to the development of scientific process skills, increased students' attitudes towards chemistry as a subject; and improved achievement in science courses. Its ability to made students discover and explore their environment thereby acquiring long lasting knowledge, and its effectiveness is not limited by attitude which made it a very suitable and positive alternative among other instructional methods for teaching/learning chemistry concepts in secondary schools. Chemistry teachers could therefore adopt learning cycle constructivist-based on teaching chemistry concepts; since it would enable them expose real life applications/experiences to students and enhance their attitude towards chemistry as a subject.

Educational implications

In the light of the findings of the present study, the following educational implications could be offered.

Many chemistry concepts are abstractive in nature which makes learning difficult. Prospective teachers should therefore be given opportunities to apply their understandings about 5E learning cycle model based on constructivist approach through in-service training.

Teachers should use instructional techniques that promote students' understanding such as: 5E learning cycle based instruction since traditional instruction (lecture method) is less effective than 5E learning cycle based instruction. With the spread of the use of 5E learning cycle activities, students' perception that science courses such as chemistry are learned by memorization can be prevented. The formation of misconceptions can be hindered by giving concrete examples for the applications of 5E learning cycle activities in real life and by working in small groups.

Teachers should be aware of students' attitudes towards chemistry since it affects students' achievement and should seek for innovative, effective and efficient student activity-oriented instructional approaches that could improve students' attitudes.

Students should also be given opportunities to design research, form hypotheses, interpret the results, and to create their own knowledge and comprehension; to help them in science process skills acquisition and better understanding of chemistry concepts.

CONFLICT OF INTERESTS

The author has not declared any conflict of interests.

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Full Length Research Paper

Place of instructional supervision in enhancing public primary school teachers' effectiveness

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The study examined the place of instructional supervision in enhancing teachers' effectiveness in public primary schools in Ebonyi State. Four research questions were formulated to guide the study. Descriptive survey research design was adopted for the study. The population of the study consists of all the 462,186 teachers including the headteachers in the 1035 primary schools in the area of study. Stratified random sampling technique was used to select 300 teachers from 60 primary schools chosen for the study. Researcher-structured questionnaire was used for data collection. The instrument was validated and test retest method was used for the reliability test. The scores were calculated using Pearson moment correlation coefficient and it yielded co-efficient value of 0.81. The data collected were analyzed using mean scores. Major findings of the study include that instructional supervision help teachers to improve their professional growth, use relevant instructional materials, improve their teaching methods and evaluate pupils' learning outcome appropriately. The recommendations were that government should recruit adequate qualified supervisor, provide adequate funds for supervisors support as well as for organizing workshops, seminars and conferences for teachers. Above all, erring staff should be made to face appropriate disciplinary actions.

Key words: Instructional supervision, teachers' effectiveness, public primary schools, Ebonyi State.

INTRODUCTION

Education in Nigeria has been identified as an instrument par excellence for effecting national development. This justifies the huge financial resources being allocated to education by the government, non-governmental organizations and private individuals. Because of the complex nature of the provision and management of education in the world over there is need for a unit designated to oversee the activities going on in the schools to ensure effective realization of educational goals in our nascent society especially at the primary

school level which is the bedrock of other levels of education. It is in line with this assumption that Aleke (2001) maintained that the development of any society starts from primary level of education and that if the foundation of a child is faulty at this level, it usually affects his or her future academic performance. It is in response to this overriding importance of primary education that both the federal and Ebonyi State government have declared free and compulsory basic education and primary/secondary education respectively.

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This gesture of the government was received with much enthusiasm by parents as the number of pupils' enrolment into primary schools increased astronomically without the corresponding number of teachers. Aleke (2001) also observed that Ebonyi State government in the bid to tackle this problem employed people with doubtful academic and professional qualification as teachers thus, increasing the role of school supervisors in order not to compromise quality. The importance of teachers in determining the quality of every level of education cannot be taken for granted since it is obvious that no education can rise above the quality of its teachers (Federal Republic of Nigeria FRN, 2004:38). Hill (1999) observed that teacher effectiveness was the key to improved educational outcome and suggested that the quality of teachers can be improved through effective supervision of instructional programme. The importance of supervision in the educational system cannot be over-emphasized especially faced with the challenging changes in the educational process. Experience has shown that many people are not always willing to do what they are expected to do without external control or monitoring in form of supervision. Ezeocha (1985) in Chike-Okoli (2006) noted that any type of assignments or projects that are undertaken by people and are not carefully supervised run into the danger of being haphazardly finished or not finished at all. He maintained that supervision helps to prevent waste of human/material resources in order to instill discipline in our schools and brings about improved school performance which is the cause of so many hue and cries in our society today. Enemu (2001) stated that instructional supervision is a planned and co-ordinated effort of supervisors to stimulate, help, advice, assist and guide the continued growth of teachers in the better understanding of more effective performance of their instructional functions. According to him, instructional supervision embraces all the activities leading to the improvement of instructional programme, boosting of teachers' moral, human relation, curriculum development and professional growth. Nwaogu (1980) in Nzegbulem and Anyaogu (2016) observed that instructional supervision helps to provide adequate conditions that are essential for effective learning through effective teaching methods. It also helps to improve teachers' capacity and methodology of impacting knowledge to the pupils. Ogbuagu (2016) posits that instructional supervision aims at seeing how the teacher manages the classroom, teachers' mastery of the subject matter and lesson delivery. This implies that instructional supervision makes the teachers to be effectively in-charge of the lesson to be taught and how to make the classroom conducive for the delivery of the lesson. Ukeje (1982) in Nwaneri and Ikwuegbu (2016) remarked that effective supervision of instruction helps to develop highly motivated teaching staff. He added that it ensures adequate use of instructional materials among teachers. Chike (2004)

summarized the roles of instructional supervision under the functions of a supervisor as follows:

- 1) Serves as a resource person, initiate ideas and suggestions and provides individual help to teachers in schools under their area of jurisdiction.
- 2) Acts as adviser to government by providing accurate knowledge of instructions and their suitability through assessment of the quality of teachers and their teaching techniques.
- 3) Provides reports on the progress of the schools in the attainment of the laid-down government objectives.
- 4) Works with the principals to engage in classroom visitation and sometimes demonstrate particular teaching method or use of relevant instructional materials.

Statement of the problem

Despite the effort of various levels of government to provide quantitative and qualitative basic education in Nigeria, the result of pupils' performance in both internal and external examinations tends to be on a steady decline in primary schools. What this implied is that when the learner has not learnt, it means the teacher has not taught. If this popular saying is something to go by, then the question one would ask is how the expected roles of teachers could be enhanced to improve their professional competence in primary schools. Given this scenario, the problem of this study could be put in question form thus: how could instructional supervision enhance teachers' effectiveness in primary schools in Ebonyi State?

Purpose of the study

The main purpose of the study was to examine the roles of instructional supervision in enhancing teachers' effectiveness in Ebonyi State public primary schools. Specifically, the study sought to:

- 1) Find out how instructional supervision help public primary school teachers to improve in their professional growth.
- 2) Ascertain how instructional supervision help public primary school teachers to use relevant instructional materials.
- 3) Examine how instructional supervision help public primary school teachers to improve their method of teaching.
- 4) Determine how instructional supervision help public primary school teachers in evaluation of learning outcome.

Scope of the study

The study investigated the roles of instructional

supervision in enhancing teachers' effectiveness in Ebonyi State primary schools. It focused on finding out how instructional supervision help teachers to improve their professional growth, use relevant instructional materials, improve their methods of teaching and evaluate learning outcome.

Research questions

The study was guided by the following research questions.

- 1) How does instructional supervision help public primary school teachers to improve in their professional growth?
- 2) How does instructional supervision help public primary school teachers to use relevant instructional materials?
- 3) How does instructional supervision help public primary school teachers to improve their methods of teaching?
- 4) How does instructional supervision help public primary school teachers in evaluation of learning outcome?

RESEARCH METHODOLOGY

Descriptive survey research design was adopted for the study because data were collected from a sample of the entire population of the study and the result of the findings generalized as the true characteristics of the targeted population (Nwankwo, 2013). The population of the study consists of all the 462,186 teachers including the head teachers in the 1035 public primary schools in Ebonyi State. (Source: Ebonyi State Secondary Education Board (SEB), 2015/2016 session school census).

Stratified random sampling technique was used to select 60 primary schools – 20 schools from each of the Abakaliki, Afikpo and Onueke education zones. The same method was used to select five teachers each including the head teacher from the schools selected. This gave a total sample size of 300 respondents.

The instrument used for data collection was a structured questionnaire developed by the researcher. It has 20 items arranged in four clusters. Each cluster was made up of five items which addressed each of the four research questions that guided the study. A four-point rating scale was the response format adopted with assigned values as follows:

Strongly Agree (SA)	-	4 points
Agree (A)	-	3 points
Disagree (D)	-	2 points
Strongly Disagree (SD)	-	1 point

A test-retest method was used to establish the reliability of the instrument. The instrument was pilot tested with twenty (20) teachers from (10) primary schools in Enugu state which shared common characteristics with Ebonyi State for two consecutive times at two weeks intervals to establish the reliability of the instrument. The scores of the two tests were compared using Pearson product moment correlation co-efficient. The result showed a correlation coefficient of 0.81 which shows that the internal consistency of the instrument was high. The researcher administered the questionnaire personally to the respondents and collected same after completion. This ensured hundred percent return of the questionnaire administered.

The data collected were analyzed using the mean scores. A

mean score of 2.5 and above was considered as agree while any item with mean score below 2.5 was regarded as disagree.

RESULTS

Research Question One: How does instructional supervision help teachers in their professional growth?

The analysis of the data in Table 1 showed that respondents agreed on items 1-3 as being applied by supervisors to help teachers grow in their profession. This implies that supervision of instruction in schools helps teachers improve their professional growth. They however disagreed with items 4 and 5 which mean that conferences and in-service training opportunities are rarely provided for teachers. This might be as a result of inadequate provision of funds by the government for the programme.

Research Question Two: How does instructional supervision help teachers to use relevant instructional materials?

Results of the data analyzed in Table 2 showed that the respondents agreed on all the items except item 8 as activities done by supervisors in the process of supervision of instruction in schools to help teachers locate and utilize relevant teaching materials. It is therefore evident from the result that instructional supervision is useful in enhancing teachers' selection/use of teaching materials in the classroom instructional programme given the grand mean of 2.62.

Research Question Three: How does instructional supervision help teachers to improve their methods of teaching?

Table 3 analyses showed that the respondents agreed that supervisors employ all the methods contained in items 11-15 in the process of supervising them except item 14 which indicates that slides are not used to show appropriate teaching method. However, the grand mean of 2.76 as shown in the table attests that instructional supervision helps to improve teachers' method of teaching.

Research Question Four: How does instructional supervision help teachers in evaluation of learning outcome?

From the analysis of data in Table 4, it is evident that the respondents agreed with the statements in items 16, 17, 18 and 20 but seem to disagree with item 19. This means

Table 1. Mean response of teachers on how instructional supervision help in improving their professional growth.

S/N	Item Statement	SA	A	D	SD	N	FX	x	Decision	X	Decision
1	Teachers grow professionally through classroom visitation by supervisors	600	270	90	15	300	975	3.25	Agree	3.25	Agree
2	Teachers grow through workshops organized by supervisors	300	360	150	30	300	840	2.8	Agree	2.8	Agree
3	Supervisors organize seminars to educate teachers on their condition of service	360	315	120	45	300	840	2.8	Agree	2.8	Agree
4	Teachers are provided the opportunities to attend conferences	300	10	150	90	300	720	2.4	Disagree	2.4	Disagree
5	Instructional supervisors inform teachers of in-service training opportunities	240	180	150	105	300	675	2.25	Disagree	2.25	Disagree
Grand mean								2.7		2.7	

Table 2. Mean response of teachers on how instructional supervision help them in the use of relevant instructional materials.

S/N	Item Statement	SA	A	D	SD	N	FX	X	Decision	Decision	
6	Supervisors emphasize the use of instructional materials during supervision	480	360	120	0	300	960	3.2	Agree	Agree	
7	Supervisors demonstrate the use of relevant instructional materials	360	270	120	30	300	780	2.6	Agree	Agree	
8	Supervisors provide relevant instructional materials during supervision	240	225	120	105	300	690	2.3	Disagree	Disagree	
9	Supervisors help teachers improvise relevant instructional materials	300	270	150	60	300	780	2.6	Agree	Agree	
10	Special workshops are organized for teachers on the selection / use of instructional materials	240	270	180	60	300	750	2.5	Agree	Agree	
Grand mean								2.62			

Table 3. Mean response of teachers on how instructional supervision help to improve their method of teaching.

S/N	Item Statement	SA	A	D	SD	N	FX	X	Decision	Decision	
11	Appropriate method of teaching are emphasized during supervision	360	450	90	15	300	915	3.05	Agree	Agree	
12	Supervisor demonstrate appropriate teaching method during classroom visitation	300	360	180	45	300	885	2.95	Agree	Agree	
13	Supervisors organise special course for teachers on teaching skills	240	450	150	15	300	855	2.85	Agree	Agree	
14	Teachers are shown appropriate teaching method with projectors	180	225	180	90	300	675	2.25	Disagree	Disagree	
15	Teachers are given orientation on the appropriate teaching methods	240	360	180	30	300	810	2.7	Agree	Agree	
Grand mean								2.76			

that supervisors rarely demonstrate test administration process to teachers during supervision but other measures are applied by supervisors to help teachers understand the need and procedure of evaluation in the teaching- learning process.

DISCUSSION

The result in Table 1 showed that teachers learn from the supervisors during classroom visitation, conferences, seminars and in-service training programmes though not

Table 4. Mean response of teachers on how instructional supervision help in their evaluation of learning outcome.

S/N	Item Statement	SA	A	D	SD	N	FX	x	Decision	X	Decision
16	Teachers are given formats for class tests during supervision	300	360	150	30	300	840	2.8	Agree	2.8	Agree
17	Teachers class evaluation reports are checked during supervision	240	315	180	45	300	780	2.6	Agree	2.6	Agree
18	Workbooks are provided to teachers for class tests during supervision	240	270	210	45	300	765	2.55	Agree	2.55	Agree
19	Supervisors demonstrate appropriate test administration procedure to teachers in slides during supervision	180	270	210	60	300	720	2.4	Disagree	2.4	Disagree
20	Special sessions are organized for teachers on the correct recording of tests by supervisors	360	270	180	60	300	870	2.9	Agree	2.9	Agree
Grand mean								2.7		2.7	

regular, the condition of service that will help them grow in their profession. This finding is in consonance with Enemuo (2005) who observed that instructional supervision embraces all the activities leading to the improvement of instruction and teachers' professional growth.

The results in Table 2 revealed that supervisors emphasize and demonstrate the use of instructional materials during supervision. Supervisors also help teachers improve their use of relevant instructional materials through special workshops on selection and use of instructional materials. This is in agreement with Atanda and Lameed (2006) who opined that instructional supervision can help to improve teaching and learning situations by advising and stimulating interest in teachers and pupils on the use of instructional aids.

The result of the data analyzed in Table 3 showed that supervisors emphasize and demonstrate appropriate teaching methods to teachers during supervision. Supervisors also organise orientation courses for teachers to educate them on the appropriate teaching skills and methods. This findings lead credence to Nwaogu (1980) in Nzegbulem and Anyaogu (2016)'s opinion that instructional supervision helps to improve teachers' capacity and methodology of impacting knowledge to pupils. The result of the data analyzed in Table 4 indicated that teachers are given formats for class tests during supervision. Teachers' class evaluation reports are checked and workbooks for class tests provided during supervision. It was also observed that supervisors' organise special sessions for teachers on the correct administration and recording of tests. However, it was equally gathered that supervisors do not use equipment like projectors and slides to relay to teachers their performance during supervision of instructional process. These findings were in tandem with the views of Ezeocha (1985) in Chike-Okoli (2006), who observed that evaluation is so vital that school supervisors must be satisfied and ensure that all facts of

the instructional program are evaluated and such record well preserved to serve as a feedback to parents, teachers, pupils, supervisors and the whole education system for the purpose of making references and improvement.

Conclusion

The results of the data analyzed revealed that teachers are rarely given opportunities for in-service training and supervisors do not carry out their supervisory roles regularly. It was also observed that the supervisors do not look for relevant instructional materials during supervision nor demonstrate appropriate teaching methods test administration with projectors/slides during supervision so as to relay it to them for correction and above all, teachers are not given opportunities for conferences and in-service training supervisors do not to help them grow in their profession. However, it was obvious from what was observed that instructional supervision if carried out effectively will help teachers grow in their profession, locate and use relevant instructional materials, improve their methods of teaching and evaluation of pupils' learning outcome.

RECOMMENDATIONS

Based on the findings of the study, the following recommendations were made; that:

- 1) The government through its agencies should overhaul the units in-charge of supervision of instruction in primary schools so that the desired goals of the system will be achieved.
- 2) Supervisors should be equipped with necessary materials and logistics that will enable them carry out their duties effectively.

3) Special funds should be provided by the government for organising regular teachers' conferences, workshops, seminars and in-service training programmes in order to keep them abreast of the desired changes in school system.

4) Supervisors and teachers should endeavour to discharge their duties according to their professional demand while erring staff should be made to face appropriate disciplinary measure.

5) Parents should assist in the monitoring of school activities and reporting observed lapses to the appropriate authority for necessary action.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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