

Impact of school location and professional qualification on level of giving feedback among primary school mathematics teachers in oral questioning process

Impacto de la ubicación de la escuela y la calificación profesional en el nivel de retroalimentación entre los maestros de matemáticas de la escuela primaria en el proceso de preguntas orales

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ABSTRACT

The purpose of this study is to explore the impact of school location and professional qualification on levels of giving feedback among primary school mathematics teachers in oral questioning. This study is a quantitative study using survey methods. Questionnaires were used in this study to collect data on the level of giving feedback in the verbal questioning of primary school teachers and to see the difference in the level of responding to verbal questioning based on school location and professional qualification of mathematics teachers (with Cronbach's alpha value of 0.91). A total of 154 primary school mathematics teachers around the state Negeri Sembilan were selected as samples for this study using simple random sampling methods. The findings were analyzed using descriptive statistical analysis and inferential statistical analysis to answer the research questions.

Keywords: Feedback, Oral questioning, Primary school mathematics teacher.

RESUMEN

El propósito de este estudio es explorar el impacto de la ubicación de la escuela y la calificación profesional en los niveles de retroalimentación entre los maestros de matemáticas de la escuela primaria en las preguntas orales. Este estudio es un estudio cuantitativo que utiliza métodos de encuesta. Los cuestionarios se utilizaron en este estudio para recopilar datos sobre el nivel de retroalimentación en el interrogatorio verbal de los maestros de primaria y para ver la diferencia en el nivel de respuesta al interrogatorio verbal basado en la ubicación de la escuela y la calificación profesional de los maestros de matemáticas (con el alfa de Cronbach valor de 0.91). Un total de 154 maestros de matemáticas de primaria en todo el estado Negeri Sembilan fueron seleccionados como muestras para este estudio utilizando métodos de muestreo aleatorio simple. Los resultados se analizaron mediante análisis estadístico descriptivo y análisis estadístico inferencial para responder las preguntas de investigación.

Palabras clave: retroalimentación, preguntas orales, profesor de matemáticas de primaria

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1. Introduction

1.1 Literature review

Feedback is seen as the main component in conducting questioning activities and one of the factors that have a strong influence on students' learning in mathematics (Havnes et al., 2012). Feedback is also referred as one of the key elements in the questioning process as contained in the Initiation-Response-Feedback Model (IRF) where feedback serves as a response given to the students after the students answer the question posed to them (Molinari et al., 2013). Cotton (2013) use the term 'formative feedback' which defines as information disseminated to students to modify their thinking or behavior for the purpose of improving learning. The main argument is feedback in the process of questioning should be used to encourage students to be more independent. The formation of self-regulation refers to the extent to which the students can control the aspects of their thinking, motivation, and behavior while learning (Veon, 2016).

A good feedback is when students are given the opportunity to reflect and provides them with appropriate scaffolding or guidance to help them carry out their tasks, understand the criteria of success and actively engage in learning (Havnes et al., 2012). According to Clark (2012), the feedback given by teachers should be implemented in the zone of proximal development (ZPD). The zone of proximal development is the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem-solving under adult guidance, or in collaboration with more capable peers (Vygotsky, 1978). In this context, students build their own knowledge based on existing knowledge and that knowledge evolves through social environments and effective interactions with the teachers. Therefore, it is very important for a teacher to improve his / her skills and knowledge in the aspect of giving feedback so that the knowledge of the student can be developed in line with the social interaction conducted by the teacher through questioning activities in the teaching process of mathematics (McAninch, 2015).

Not all feedback are formative (Heritage, 2011). For example, by simply telling students to 'work hard' is not considered a feedback in the formative assessment because the statement does not help to develop. However, giving students a specific strategy to work on problem-solving is a good feedback practice in the mathematic teaching and learning process (Hadley, 2010; Havnes et al., 2012). Svinicki (2010) states that a good feedback should encourage students to correct their mistakes, for example, students comparing their solutions with their successful classmates' solutions. Additionally, criticism should also be avoided as a negative feedback may result in undesirable attitude changes to students (Black & McCormick, 2010).

However, there was a problem in giving feedback to students in questioning activities during teaching and learning mathematics (Hadley, 2010). This is because there was a claim that the teachers did not provide feedback effectively to the students during a questioning activity (Shahrill & Clarke, 2014). In this context, teachers do not comment and discuss the answers given by the students but only state whether the answers or responses given by the students are correct or false. This indirectly makes learning process less meaningful and does not stimulate students to think higher.

In addition, misunderstanding about giving feedback and handling feedback in an improper manner tends to negatively affect the student learning process. This is because providing good feedback in oral questioning activities are very important processes in ensuring that students understand the well-learned mathematical concepts and in promoting bilateral interactions between teachers and students (Choi et al., 2005). The good responses and feedback from teachers can help students to correct their misconceptions on the concepts learned and give teachers the space to help students to improve their thinking in mathematics (Franke et al., 2009). Additionally, studies by Dibbs (2014) showed that the most difficult aspect in the teaching and learning process is giving feedback to students. This matter needs to be studied as feedback is seen as a key component of oral questioning practice and is one of the factors that have a strong influence on the development of students' learning (Henning et al., 2012).

Besides, there was also a study which reported that the difference in school location such as urban and rural school teachers showed a significant difference in the aspect of providing feedback where teachers who were teaching in urban school were found to be providing greater feedback than teachers in the rural areas (Jamaluddin, 2007; Ramlah, 2016; Suzana, 2015). However, that study did not focus on the aspect of providing feedback to primary school mathematics teachers but instead focused on other subjects as well as teachers other than primary school. Hence, the question here is whether there is still a significant difference in the practice of giving feedback on the teaching and learning process of primary school mathematics teachers based on the school location

Besides, very few studies conducted on primary school mathematics teachers in terms of providing feedback on verbal questioning based on professional qualification. In addition, there is also a recent study that teachers with low level of professionalism qualification are not able to provide better feedback to students in verbal questioning activities (Mumtaz, 2013). However, the findings do not focus on mathematics teachers in primary schools but

towards university lecturers. In addition, there are previous studies that examine the factors that influence the level of feedback given by mathematics teachers such as instructional time, teaching experience and level of teacher knowledge (McAninch, 2015; Shute, 2008). However, all of these studies did not mention the school location and professional qualifications of mathematics teachers that might affect the level of primary school mathematics teachers in responding to the students in oral questioning activities during the teaching of mathematics. Hence, this study is important to reduce the research gap between limited studies on the level of feedback based on the school location and professional qualification. Therefore, it is very interesting for researchers to understand more about this phenomenon. Hence, this study was conducted to answer and explain one research questions:

- What is the impact of school location and professional qualification on level of giving feedback in oral questioning of primary school mathematics teachers?

2. Methodology

This is a quantitative study using survey method. Questionnaires were used in this study to collect data on the level of giving feedback in the oral questioning activity of primary school teachers and to see the difference in the practice of giving feedback in oral questioning activities based on the school location and professional qualification of mathematics teachers. The samples of the study were primary school mathematics teachers who taught year 1 to year 6 mathematics at primary schools around Negeri Sembilan. A total of 158 primary school math teachers were selected as samples for this study using simple random sampling methods. This sampling method was used to ensure that every mathematics teacher at schools around Negeri Sembilan had the same opportunity to be selected as respondents in this study (Creswell, 2013)

The researcher chose to use questionnaire as the main tool for collecting data due to the constraints of the large sample size and the location of the sample. This questionnaire was consisted of two parts: part A and part B. Part A was related to teacher information (7 items), while part B was about the level of giving feedback in oral questioning activity (19 items). This questionnaire used 5 point Likert scale: 1: Never, 2: Rarely, 3: Sometimes, 4: Regular and 5: Most frequent.

The reliability of the questionnaire for this study was based on Cronbach's Alpha value which is 0.913. This value was obtained during the pilot studies and was appropriate to continue with the actual study due to its high reliability. The data obtained from the questionnaire were processed and analyzed using Statistical Package for Social Sciences (SPSS) version 24 for Windows. The analyses carried out using SPSS were descriptive analysis and inferential analysis. Descriptive analysis is used to describe the characteristics of variables while inferential analysis is used to make a generalization of the results from the sample to the study population (Chua, 2012).

3. Results and analysis

3.1 Respondents' profile

In this section, the demographic information to be discussed are gender, school location, teaching experience, academic qualifications, options and professional qualifications. From the aspect of gender, 44 (27.80%) of the Mathematics teachers were male while 114 (72.20%) of them were female and this makes the total number of teachers to be the sample for this study as 158 teachers. This implies that most of the teachers involved in the study was consisted of female teachers.

From the aspect of school location, 50 (31.6%) teachers involved were teaching in urban schools while 108 (68.4%) teachers were teaching in rural schools. In addition, as for the teaching experience aspect of primary school mathematics teachers, the study found that there were 60 (38.0%) teachers with 1 to 10 years of teaching experience, 44 (27.8%) teachers had 11 to 20 years of teaching experience and the remaining 54 (34.2%) teachers had teaching experience of 21 to 30 years. Therefore, the majority of samples for this study had 1 to 10 years of teaching experience. On the other hand, 44 (27.9%) teachers had a Diploma in Teaching, 20 (12.7%) teachers had a Diploma in Education and the remaining 94 (59.4%) teachers had a Bachelor of Education.

Table 1. Demographic profile of the respondents

Demography		Number	Percentage	
Sex	Man	44	27.80%	
	Woman	114	72.20%	
School Location	City	50	31.60%	
	Rural	108	68.40%	
Experience Mathematics	Teaching	1 year to 10 years	60	38.00%
		11 years to 20 years	44	27.80%
		21 years to 30 years	54	34.2%

Professional Qualifications	Diploma in Teaching	44	27.90%
	Diploma in Education	20	12.70%
	Bachelor of Education	94	59.40%

3.2 The impact of school location and professional qualification on levels of giving feedback among primary school mathematics teachers in oral questioning

The test for determining the homogeneity of variance was carried out first using the Levene test before a two-way ANOVA analysis was conducted to ensure that the two-way ANOVA test conducted complies with the appropriate conditions. As a result of the Levene test, it was found that the results of the non-significant Levene test showed that the variance of dependent variables in each sample group was almost identical (Pallant & Manual, 2013). Levene's analysis of the tests performed as shown in Table 2.

Table 2. Levene test results

F Value	df1	df2	Significance
2.871	5	152	0.355

Table 2 shows the results of the Levene test which was conducted, i.e. $F(5, 152) = 2.871$, $P = 0.355$ indicate that the value was not significant ($p > 0.05$). The findings of this test also showed that the variance values for dependent variables in each sample group were almost identical. Therefore, the study data comply with the two-way ANOVA test requirements. The results of the two-way ANOVA test analysis are as follows

Table 3. Two-way ANOVA analysis of giving feedback in oral questioning activity of primary school mathematics teachers based on school location and professional qualification

Main Impact	Sum of Squares	df	Mean Square	F	Significant Levels
School Location	.137	1	.137	.741	.391
Professional Qualification	.832	2	.416	2.244	.110
School Location * Professional Qualification	.397	2	.198	1.069	.346
Error	28.196	152	.186		
Total	2651.756	158			

A two-way between-groups analysis of variance was conducted to explore the impact of school location and professional qualification on the level of giving feedback of primary school mathematics teachers in oral questioning activities (Group 1: Diploma in Teaching; Group 2: Diploma in Education; Group 3: Bachelor Degree of Education). The interaction effect between school location and professional qualification group was not statistically significant, $F(2, 152) = 1.069$, $p = 0.346$. Besides, there was a not statistically significant main effect for school location $F(1, 152) = 0.741$, $p = 0.391$; and professional qualification $F(2, 152) = 2.244$, $p = 0.110$. So, the two-way ANOVA test results show that there is no significant difference in the level of feedback in oral questioning activities of primary school mathematics teachers based on school location and professional qualification.

4. Discussion

The findings show that there is no significant difference in the practice of giving feedback in oral questioning activities among primary school mathematics teachers based on school location and professional qualification. Thus, the location of the school and professional qualification of primary school mathematics teachers does not affect the level of giving feedback in oral questioning activities that has been implemented. This finding coincides with the findings of Jamaluddin (2007); Ramlah (2016) and Suzana (2015). Hence, coinciding with the findings of this study, researchers have identified other factors that influence the practice of giving feedback in oral questioning activities by primary school mathematics teachers.

Shute (2008) states that the level of students' achievement influence how the practice of feedback is implemented by a teacher. His study notes that immediate feedback is given to low-achieving students while delayed feedback is more appropriate for high-achieving students. In addition, a study conducted by McAninch (2015) found that the frequency of use of oral questioning by primary school mathematics teachers in high-achieving students class were more frequent than the frequency of oral questioning in the classroom of low-achieving students. The lack of questions posed to students led to the lack of feedback given by teachers to students. This is because giving feedback is very closely related to oral questioning activity. The practice of giving feedback on the response of students is one of the key elements in the process of questioning as specified in the Initiation-Response-Feedback (IRF) Model in which it is a normal process in the execution of oral questioning involving questions of teachers (initiation) - answer from student (response) – feedback for the student's response (feedback). Hence, this implies that the practice of giving feedback to students' responses in questioning activity is not influenced by school location and professional qualification.

Education in Malaysia which is more focused on exams forces teachers to pursue mathematical syllabus in a short time (Suah & Ong, 2011). This indirectly makes the teaching and learning process in the classroom more focused on memorizing facts, procedures and techniques to answer exam questions correctly, especially in solving mathematical problems. As a result, the lack of questioning activity implemented in the classroom thus influencing the practice of giving feedback in oral questioning activities. This indirectly proves that school location and professional qualification do not impact the practice of giving feedback in the oral questioning activity of primary school mathematics teachers.

Additionally, lack of knowledge and understanding among teachers on how to provide effective feedback to students also explain level of providing feedback is not influenced by school location and professional qualification. It is also stated by Rohaya Talib et al. (2014) that teachers have a weak understanding and knowledge of how to provide feedback effectively to students, especially in applying assessment for learning to help improve student learning. Lack of knowledge and understanding of teachers towards the practice of feedback also leads to the lack of interest in the teaching and learning process as well as resulting in the lack of involvement of students in learning activities.

Besides, the topics taught also influence teachers' practice in providing feedback to students. This is supported by Shahrill and Clarke (2014) who find that oral questioning activities will be more frequently used in difficult topics as more questions are needed to enhance students' understanding of the topics being taught. Hence, the more often oral questions are asked to the students, the more often the teachers need to give feedback to the students' response. The oral questioning activity is a catalyst for students' understanding in parallel with Koizumi (2013) study findings that teachers use oral questions to improve students' understanding of the topics taught. Hence, in more difficult topics, teachers will respond more frequently as a result of questioning in the teaching and learning of the more difficult topics. This is indirectly making questions asked by teachers more open-ended and helping students to improve understanding (Weiland et al., 2014). This once again indirectly proves that school location and professional qualification do not influence to the level of giving feedback in the oral questioning activity of primary school mathematics teachers.

In addition, teachers who are not ready to implement the effective feedback in mathematics teaching also answer the question of why there is no significant difference in level of providing feedback to students based on school location and professional qualification (Kassim & Zakaria, 2013). In this context, teachers' readiness is seen from two aspects which are readiness of knowledge and mental and emotional readiness. The findings by Zarina (2016) point out that the readiness of teachers in the aspect of knowledge especially mathematical knowledge of teaching greatly influences teachers in implementing effective feedback. From the emotional aspect, teachers are not interested in providing feedback effectively to students in the teaching and learning process but instead prefer to provide feedback in simple forms such as 'right', 'wrong', 'good' and 'ok'.

The readiness of teachers in implementing the practice of giving feedback is also influenced by in-services training or courses provided to teachers. The lack of training for teachers in the aspect of providing feedback to students indirectly influences the level of providing teacher feedback on student responses (Abdullah et al., 2015). This is also evidenced in a study by Suzana (2015) that teachers' training in the aspect of providing feedback is still at a moderate level. Hence, it is very important for teachers, especially primary school mathematics teachers to have enough training to implement the practice of giving feedback in oral questioning more effectively. Therefore, school location and professional qualification do not have a significant impact in level of giving feedback to students' responses in the process of oral questioning in mathematics teaching.

5. Conclusion

This study has shown that the level of giving feedbacks to student responses in oral questioning activity is not influenced by school location and professional qualification. This study has also shown that the practice of giving feedback to student responses in oral questioning activity has been carried out well by primary school math teachers. Hence, this study is expected to be able to assist and provide guidance to mathematic teachers to improve the practice of giving feedback in the oral questioning activity. In addition, there are reasonable practical implications to be taken into consideration by the policy makers and implementers in relation to teachers' professional development.

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