THE IMPACT OF TEACHER-LEARNER POWER-SHARING STRATEGY ON LEARNER CENTERED INSTRUCTION IN MATHEMATICS AND INTEGRATED SCIENCE AT MUPAMAPAMO SECONDARY SCHOOL

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Abstract

This study documents the extent to which two teachers of Integrated Science and Mathematics shared their classroom power with their learners in order to enhance learner-centred instruction in the four key result areas of teacher job description in Zambia (planning, teaching, classroom management and evaluation). The study investigated (1) the extent to which learners were involved in the four key result areas and (2) the type of power bases the teachers used to control the classroom transactions. The rationale was that if learners were to be at the centre of lessons, teachers needed to relinquish part of their classroom power to their learners. The reframed teacher power use scale (rTPUS) questionnaire, written interviews, document analysis and observation checklists were used to collect data. Data was analyzed by critical discourse analysis. Generally, results indicated that Teacher B involved his learners more than teacher A in the four key result areas, and he was more social than teacher A.

Key words: Learner-centered instruction, expert power, referent power, reward power, legitimate power.

1 Introduction

Despite learner-centered curriculum being advocated for and adopted in many countries, most teachers have lamentably failed to implement it correctly (Weimer, 2002; Banda & Tindi, 2015; Mwanza, 2017, Namayanga & Sato, 2017). In the researchers many years of work experience as teachers of natural sciences, they have been witnessing some learners complain about how some teachers abuse their power towards them. The sentiments include crude language, unfriendliness, unapproachable, uncaring and reporting late for work among others. These incidences poison the teacher-pupil relationships, and in the end learner-centered approaches suffer because learners do not feel free to participate in classrooms where there is tension.

1.1 Statement of the problem

The wrestle for power between teachers and learners is one of the reasons teachers fail to correctly implementing learner-centered education among some teachers (Weimer, 2002 & Franklin & Harrington, 2019). Teacher-

learner power-sharing has not been equitably distributed, causing teacher dominion over learners. This has contributed to poor teacher-pupil relationships, results into teacher-learner conflicts (Franklin & Harrington, 2019). This leads to learner disengagement in the learning process (Weimer, 2002 & Mokhele, 2006). Power-sharing between teachers and learners on the four key result areas of the teacher's job description could be the answer to enhancing learner-centred lessons which may lead to deeper conception among learners.

1.2 Objectives for the study
The objectives of this study were to determine:
1. The extent to which learners were involved in planning the learning activities.
2. The extent to which learners were involved in peer teaching.
3. The extent to which learners were involved in classroom management.
4. The extent to which learners were involved in peer and self-evaluation.
5. The type of power bases the two teachers used to control their learners during lessons.

1.3 Research questions
1. To what extent were learners involved in planning the learning activities?
2. To what extent were learners involved in teaching?
3. To what extent were learners involved in classroom management?
4. To what extent were learners involved in evaluation?
5. What power bases were teachers using to control their learners during lessons?

1.4 Theoretical framework
The theoretical framework used was anchored on the five power bases of French and Raven (1959, as cited in McCroskey and Richmond (1983).

1.5 Conceptual framework
Generally, teachers who share their classroom power with learners use reward, expert and referent power bases. Such teachers are social; they use learner-centred methods, and are liked by their learners. On the other hand, teachers who do not share their classroom power with their learners use coercive and legitimate power bases. Such teachers are antisocial, use teacher-centred instructions, and are usually not liked by their learners. Understanding power use in classrooms is essential to setting up pro-social learning environments which avoids teacher-power abuse. Therefore, teachers must adopt strategies that help them get a sense of students' perception that there is a balance of power by using reward, referent and expert powers which are pro-social. Teachers must minimize the use of coercive and legitimate power which is viewed as anti-social by learners (Barton, 2010). Pro-social power is positively associated with learning outcomes, motivation, teacher effectiveness and credibility (McCroskey & Richmond, 1983).

2. Power
McCroskey and Richmond (1983) define power as the capacity one person has to influence another person to do something he would not have done had he not been influenced by that particular person. Power makes the powerful person control the weaker person by using the authority they have (Wodak & Michael, 2008). In the long run, the freedoms of action and expression of the weak are limited.

2.1 The traditional position of a teacher
The teacher's authority has been unquestionable and unchallengeable by learners in the past. Teachers enjoy more power than learners because they have authority over learners (Weimer, 2002; Lee & Kim, 2017 & Mokhele, 2006). The pre and post-colonial era saw teachers use a cane as a means of managing learner behaviour. For countries in the Far East, teacher-learner relationship is likened to King-subjects relationship (Lee & Kim, 2017). What the king says is final. This suggests that learners are forced to accept facts as they are presented by the

teacher without having them verified through critical analysis (Barton, 2010). Teacher obedience is another virtue which could be elicited from the Korean proverb, 'Don't even step on the teacher's shadow' (Lee & Kim, 2017). McCroskey and Richmond (1983) identify the following as types of power that teachers exercise against their learners.

2.1.1 Coercive power

Teachers have the power to punish learners for poor performance or for not complying with their demands. Hence, learners' view is that if they fail to conform to the teacher's demands, they would be punished.

2.1.2 Legitimate power

By law, teachers have authority over learners, and they are expected to set rules and expectations in class. Hence, the student's perception is that the teacher has the right to make some demands on learners because of their assigned legal position.

2.1.3 Reward power

Teachers reward students for good performance or for complying with the teacher's requests. Hence learners' view is that if they do what the teacher is prompting them to do, they would receive a reward. Teachers can use rewards such as grades, responsibility, privilege, attention and recognition to make learners move in a certain direction.

2.1.4 Expert power

Teachers have the expertise in content and pedagogy in the subject they are teaching. Therefore, the learners' view is that a teacher is knowledgeable and competent in their practice, and therefore, they ought to follow their demand.

2.1.5 Referent power

This is the type of power that a teacher uses to relate and understand students' concerns about their general well-being and overall education. Teachers expressing this type of power warmly interact with their learners during the teaching-learning process. Such teachers are empathetic, sympathetic, and are approachable by learners since learners feel that such teachers are interested in their needs and concerns, and, hence, ready to help them. Such teachers also show respect and affection towards their learners based on the understanding that learners are in a weaker position.

2.2 Genesis of power-sharing in learning institutions

Chesler (1970) envisioned the need to incorporate students in decision making process in learning institutions in order to avoid anarchy. He believed that if the governed were involved in decision making they would most likely obey the rules because they would believe that they own them. This would ameliorate the prevalence of friction between learners and school authority. This is actually a power-sharing deal. In the same vein, learners must be involved in planning, teaching, classroom management and evaluation.

2.3 Power-sharing in planning the roles

Teachers must involve their learners in planning for the term's work. For example, to identifying experiments, field trips, research projects and peer teaching projects to be done in a term (Barton, 2010). This might promote sense of ownership of the learning materials as well as the learning process itself. It could also promote self-directing as well as lifelong learning skills among the learners. During lesson planning, the roles of teachers and learners must be explicitly written on lesson plans so that teachers do not overlap into learners' roles. The roles

must be tilted towards learners' needs and interests so that the lessons are enjoyed by learners (Franklin & Harrington, 2019). Needs and interests could be elicited from learners' social environment. For example, most of the secondary school learners like playing with phones. These phones could be used, for example, in chemistry lessons as a medium for watching videos during a titration lesson. Learners must also be explicitly told that it was their responsibility to learn by being involved in all learning activities. When learners take up the responsibility of learning, they fulfil the experiential learning (Sefika & Eylem, 2015). It appears the more responsibility learners are given, the greater the power they exercise for during learning.

2.4 Power-sharing in teaching

In order to promote learner-centred lessons, teachers must make sure that learners' roles are executed as planned in the lesson plans. They must avoid hijacking the learners' responsibilities by doing it themselves. Learners must also be involved in peer-teaching on topics of their own choice (Franklin & Harrington, 2019). Peer-teaching helps learners consolidate their conceptual understanding. Peer teaching is good because some learners may be freer to interact with peers than with the teacher. Hence, this provides an opportunity for them to ask more questions in their quest better their conception.

2.5. Power-sharing in classroom management

Classroom management encompasses the control of the physical environment, establishment of rules and routines, development of effective relationships, and prevention of misbehavior and the response to it (Garrett, 2015). However, teacher-centered managed classrooms are long gone because they promote learner passivity, lack of creativity and higher order thinking skills among learners (Freiberg, 1999 & Brophy, 2006, as cited in (Garrett, 2015). The following are ways through which classroom management can be shared between teachers and their learners.

2.5.1 Formulation of classroom rule

Franklin and Harrington (2019) suggest that learners must be involved in formulating classroom rules and policies so that learners can have a sense of ownership. And when they feel that they own them, they would obey them voluntarily. For instance, teachers and learners may agree on the following: What should be done to learners who (1) do not write assignments (2) do not participate in classroom activities (3) hand in assignments beyond the due date (4) use abusive language to peers and teachers (5) come late to classroom (5) fail to clean the classroom on their turn, and many others. Such rules would act as the classroom watchdog to let the teacher act within the confines of the rules and policies agreed upon. Learners would also welcome the consequences of failing to obey the classroom rules, hence, no 'hard feelings' when penalties are instituted by either the peers or the teacher.

2.5.2 Love, care and mutual respect

Teachers must create a culture of respect, cooperation, interaction and engagement to foster a safe social learning environment. Vices such as bullying, tribalism, regionalism, and racism should have no place in classrooms. Learners must be taught to appreciate the cultural diversity of the classroom. Both teachers and learners must be kind, sympathetic, empathetic and understanding to each other (Weimer, 2002 & Franklin & Harrington, 2019). Good relationships can flourish through mutual relationships. Franklin and Harrington (2019) observed that most learners at secondary schools are adolescents. At this age, they yearn for mutual respect. This means that mutual respect can only be built by sustained effort from both the teacher and learners to ameliorate the ever conflicts between teachers and learners.

2.6 Power sharing in evaluation process

Change in learning ideology triggers change in evaluation procedures. Therefore, learner-centred education means learner-centred evaluation as well. Chitimwango and Mbuzi (2017) define evaluation as activities that teachers and learners undertake to get information that can be used diagnostically in order to improve the teaching

and learning process. Alternatively, evaluation is the process of gathering information by either the teacher or the learners to determine how much teaching or learning has taken place after or during the lesson (Ministry of Education, 2013). The gathered information reveals the strengths or gaps of the teaching by the teacher or the learning by the learners, and this helps them to make precise corrective measures. Evaluation is divided into two categories, and each category differs in the way the information gathered is used:

2.6.1 Summative assessment

The purpose of summative assessment involves grading of learners at the end of the term or at the final examination in order to determine whether or not each learner can proceed to the next level of education (Ministry of Education, 2013).

2.6.2 Formative assessment

This type of assessment occurs while the learning is taking place. Formative assessment allows teachers, learners and parents to not only gain a clear understanding of how well learning is taking place, but also to take appropriate actions to sustain the strengths as well as remedying the gaps (Ministry of Education, 2013). Sadly, Zambian teachers' assessment skills leave much to be desired (Chitimwango & Mbuzi, 2017). Despite the change from teacher-centred to learner-centred lessons, evaluation procedures have remained teacher-centred. Most of the assessments given are meant for grading. Learners are seldom involved in self and peer assessments.

3. Methodology

A qualitative research design was used to conduct the study. The reframed teacher-power use scale (rTPUS) questionnaire, adapted from (Reid & Kawash, 2013), document analysis, observation checklist and written interviews were used to collect the data. All research ethics were duly observed. Permission was granted by the school management. The two teachers were requested to allow the writer to carry out the study with them in their respective classrooms. They were asked to prepare learner-centred lessons to the best of their abilities in line with Zambia Education Enhancement Program standards. Each teacher was observed two times in their specialization in order to allow enough time to capture all the elements of teacher-learner power-sharing that the researchers had prepared for the study. The main focus of this study was to establish the extent to which the two teachers shared their classroom power with their learners in pursuit of enhanced learner-centred education. The parameters used to measure teacher-learner power-sharing were the four key result areas (planning, teaching, classroom management and evaluation) and the type of power bases teachers used to control the teaching-learning activities in integrated science and mathematics lessons. The extent to which learners were involved in planning, teaching, classroom management and evaluation helped the researcher to decide whether or not teachers' classroom power was shared with their learners. Not only that, the teachers' use of different forms of power bases to control their teaching-learning affairs in their classes also helped the researcher to find out the extent to which power was shared. The power bases included coercive, legitimate, expert, referent and reward. The power bases were divided into two categories: pro-social and antisocial (McCroskey & Richmond, 1983). The pro-social comprised the reward, expert and referent powers while the antisocial was made up of coercive and legitimate powers (McCroskey & Richmond, 1983).

3.1 Questionnaire item

The rTPUS questionnaire allowed the two teachers to reflectively evaluate themselves on the way they used their classroom power to control proceeds of the classroom (Reid & Kawash, 2017) before lesson observations. Thus, teacher-power base was captured by the 20 item questionnaire, which comprised the five-point-Likert scale, ranging from strongly disagree to strongly agree. 10 items were for pro-social and 10 anti-social categories respectively. Of the 10 anti-social items, 5 items were on coercive and another 5 for legitimate powers respectively. 4 questionnaire items were for expert power base, 4 for reward power base respectively, and lastly 2 for referent power. Table 1 shows the questionnaire items and the responses of the two teachers.

Table 1: Questionnaire responses for teacher A

S/No	Item	Teacher A					Teacher B				
		Strongly	Disagree	Not	Agree	Strongly agree	Strongly	disagree	Not sure	Agree	Strongly agree
1	I relate with students in an approachable manner (Referent power)					×					×
2	I see the learning experience from my learners' perspective (Referent power)				×						×
3	I publicly recognize students who exceed expectations in performance (Reward power)				×						×
4	I commend students when they demonstrate mastery of course material (Reward power)				×						×
5	I give out compliments or praise to students who follow instructions (Reward power)					×					×
6	I reward students for complying with requests (Reward power)					×				×	
7	I ensure lessons are clearly organized and well delivered (Expert power)				×						×
8	I demonstrate advanced knowledge in content and methodology (Expert power)				×						×
9	I design lessons in a way that is best for student learning (Expert power)				×						×
10	I discuss current research in science with my learners (Expert power)		×						×		
11	I communicate to students to never disobey my instructions (legitimate power)					×	×				
12	I emphasize that classroom rules will be backed by school administration (legitimate power)			×							×
13	I communicate to students that teacher's needs take priority over theirs (legitimate power)	×						×			
14	I maintain professional distance with learners (legitimate power)				×					×	
15	I make sure that learners recognize my authority in class (legitimate power)				×			×			
16	I draw attention to students if they do not perform up to expectations (coercive power)				×					×	
17	I assert my authority if learners challenge my teaching (coercive power)	×						×			
18	I punish learners if they fail to hand in homework (coercive power)	×								×	

19	I punish students if they do not follow instructions (coercive power)	×					×			
20	I maintain total control of the classroom (legitimate power)	×								×

3.2 Document analysis

Document analysis was conducted before lesson observations were done in order to ascertain the roles of teachers and those of learners on the lesson plans. This was done in order to find out if the roles of the teachers and learners were explicitly written on lesson plans. For example, what roles would learners and teachers perform during teaching, class management and evaluation. If roles were written, it meant that the two teachers were aware that their roles were congruent to the learners'.

3.3 Written interviews

Written interviews were conducted before observing the lessons to find out how and why the teachers would involve their learners in planning, teaching, classroom management and evaluation. This was done in order for the researcher to have a deeper understanding of the teacher's worldview on power-sharing. Table 2 shows the interview schedule and responses from the two teachers.

Table 2: Interview questionnaire items and responses

S/No	Question	Response	
		Teacher A	**Teacher B**
1	a) Do you involve learners in planning work for the term/lesson plans? b) Explain; i) why you involve/don't them ii) how you involve them, if you do?	a)Yes b) i. they are the main stakeholders ii) I involve activities that directly involve their input	a) At times b) i) I involve them at times especially when I need to make teaching/learning aids that can be made by them By giving them tasks of making teaching/learning aids that they can make
3	a) Do you involve learners in classroom management? Explain; i) why you involve/dont them	a) Yes i)Assign them duties and responsibilities like being a class monitor, leader, etc	Yes To teach them acquire management skills

	ii) how you involve them, if you do?	ii)Assign them with duties and responsibilities	
		b)	I do it using class monitors, mistresses and group leaders and group leaders whom I alternate
	b) how do you deal with		
	i) absentees?	i) counsel them and educate them on the importance of school	By making follow-ups to their parents/guardians if it persists. This is done when I seriously investigate from learners
		ii)by counselling them	
	ii) late comers?		I investigate why they report late to school, and then I apply necessary interventions.
		iii)counsel them	
	iii) noise makers		There are no noise makers in my class, considering the way I plan my work. All learners are always busy.
		iv) advise them accordingly	I investigate why they don't do them. If the reason they give is, I make them do the work at school
	iv) learners who fail to submit assignments/homework?		I physically supervise them myself.
		v) advise them accordingly	
	v) learners who fail to clean the classroom?		I find time to sit them down, and sometimes I involve the guidance and counselling department if I fail
	vi) learners with psycho-social problems	vi) counsel them, spend time with them	
4	a) Do you involve learners in class work evaluation?	a) yes	Yes
	Explain;		
	i) Why you involve/don't them.		So that they also know the expectation of the lesson
	ii) how you involve them, if you do?	i) as a follow up activity and revision	During (mostly) conclusion stage of the lesson
		ii)to know/assess if the objectives have been met or even knowing whether you are making progress or not	

3.4 Observation checklists

Two types of observation checklists were used: Table 3 shows observation checklist and the findings on the type of power bases that each of the two teachers practically used in their lessons. Table 4 shows the observation checklist and its findings on the extent to which learners were involved in teaching, classroom management and evaluation. In other words, they were meant to triangulate the two teachers' responses on the questionnaire, document analysis and the interview schedule. The observation checklists were scored by putting an X when a particular power base was expressed by the teacher, and when learners were involvement in teaching, classroom management and evaluation. The type of power bases used by each teacher, and the degree to which learners were involved in the key result areas helped the researcher to make an informed decision on the extent to which each of the two teachers shared their power with their learners in the lessons. The thinking was that if the two teachers involved their learners in the key result areas, it meant that the teachers were pro-social. But if the teachers did not involve the learners in the key result areas, it meant that the teachers were anti-social McCroskey & Richmond, 1983). The consequences of a teacher being pro-social or anti-social cannot be over-emphasized. On observation of power expressions, the researcher paid particular attention to the words or phrases synonymous with coercive, legitimate, reward, expert and referent power bases. Each teacher was observed two times and all lessons were video recorded in order to be analyzed at the researcher's convenient time. For instance, legitimate power might encompass phrases such as 'follow instructions, I am the only authority here, respect the teacher, I am in charge of this class'. Similarly, reward power could be synonymous with phrases like; 'good work, well-done, wonderful, you are intelligent, I am happy for your good performance, excellent'. Referent power may include 'do this work for your own good, I am concerned about your well-being, I would like all of you to pass the final exam'. Coercive power might as well be elicited from phrase such as 'I will punish all those who will not do the homework, I don't tolerate lazy pupils, and I hate being challenged by a pupil'. Each time words or phrase similar to these were used by the teacher; it was noted on the checklist by putting an X.

Table 3: Teacher power use in classroom

Key result area	Teacher A					Teacher B				
	Coercive	Legitimate	Reward	Expert	Referent	Coercive	Legitimate	Reward	Expert	Referent
Teaching	X	X			X			X	X	X
Classroom management	X X	X							X	
Evaluation	X	x	X	X		X X		X		X X

Table 4: Learner involvement in key result areas

Key result area	Specific activity	Teacher A							Teacher B	
Teaching	Peer teaching								X	X
	Project presentation									
Classroom management	Call for attention	X	X	X	X	X	X	X	X	
	Rules/concern for cleanliness in class	X		X		X			X	
Evaluation	Self-evaluation								X	X X X X
	Peer-evaluation								X	X X X X

4.0 Results and discussion

The study investigated the extent to which the two teachers shared their classroom power with their learners in pursuit of learner-centred instruction. The lenses used to determine the degree of teacher-learner power-sharing were the type power-bases that teachers used to control the proceeds of the classrooms, and the degree to which learners were involved in the four key result areas of the teacher job description.

4.1 On the questionnaire

The purpose of the questionnaire was to find out the type of power bases that the two teachers were using to control their learners as well as classroom transactions. Table 4 shows categorized responses of each teacher on the rTPUS. Responses were either pro-social, anti-social response or a neutral response. Categorization was done by putting an X on the scale depending on the teacher's response per questionnaire item. The total score for each scale was added, and then converted to percentage to establish whether each of the two teachers was social or anti-social or neutral

Table 4: analysis of questionnaire items

S/No	Teacher A			Teacher B		
	Pro-social	Anti-social	Neutral	Pro-social	Anti-social	Neutral
1	×			×		
2	×			×		
3	×			×		
4	×			×		
5	×			×		
6	×			×		
7	×			×		
8	×			×		
9	×			×		
10			×			×
11		×		×		
12			×		×	
13	×			×		
14		×			×	
15		×		×		
16		×			×	
17	×			×		
18	×				×	
19	×			×		
20	×				×	
Total score	14	4	2	14	5	1

Teacher A

The information on table 4 shows that teacher A was generally sociable, likeable and approachable by learners since he scored 14 out of 20, comprising 70% of the total score. Only on 4 items, making up to 20% of the total score showed that the teacher was anti-social, while 2 (10%) responses showed that the teacher was undecided.

The 70 % score meant that the teacher was frequently using referent, reward and expert power bases to control learners and the learning activities in teaching.

Teacher B

Teacher B scored 14 (70%) on the social scale, 5 (25%) on the anti-social scale and 1 (5%) on the neutral scale. All in all, teacher B was sociable and approachable since most of the scores laid on the social scale. This meant that the teacher was mostly using referent, reward and expert power during his lessons.

4.2 On the observation checklist

The observation checklist was used to verify the authenticity of information gotten from the document analysis (lesson plans), questionnaire, and the interview schedule. In other words, the observation checklist was meant to find out if the information gathered by document analysis, questionnaire, and the interview could correlate with practical classroom proceedings.

4.2.1   Lesson plans

Lesson plans for the two teachers were analyzed to find out whether the planned roles of the teachers and those of learners were executed as planned by the teacher. The rationale was that sometimes teachers do hijack learners' roles or responsibility of learning, and they perform the roles that were originally planned for learners.

Teacher A

The roles for both the teacher and learners were explicitly written on the lesson plans. He taught the lessons as was planned. This was observed on the photocopied lesson plan which the researcher was referring to during the lesson. Most of the roles planned for him and learners were executed by the responsible party. However, there was a moment during the lesson when the teacher had asked the learners some questions. Unfortunately, the teacher answered his own questions when learners failed to respond to them. The teacher did not probe the learners for the right response, which he could have done. However, it was concluded that much of the planned learning responsibility was done by the learners.

Teacher B

The roles for teacher B and for his learners were clearly indicated on the lesson plans. The practical experiments planned in each of the two lessons were well executed by the learners. However, there was a moment during one lesson where the teacher did not give his learners enough time to execute their responsibility of learning. For example, he had planned that he would allow learners 20 minutes to do group discussions, but only 10 minutes were allowed for so much work to be discussed. At the end, the teacher was observed taking the responsibility of learning away from the learners. This made learners fail to complete the work by themselves.

4.3 Observation on power use in classrooms

Both teachers were observed two times to ascertain the power base they were using to control classroom transactions. Results on table 3 suggested that teacher A was using pro-social power bases while teacher B was using a mixture of pro-social and anti-social during the teaching-learning activities.

4.4 Observation on learner involvement in key result areas

Table 4 shows the degree to which learners were involved in teaching, classroom management and evaluation. Results showed that teacher A involved his learners much in classroom management. Teacher B involved his learners more than teacher A. for example, in peer-teaching, he involved two learners who were each given a lesson to teach the peers while the teacher took note of the misconceptions that facilitators had during the teaching-learning process. Learners could also be heard calling for peer-attention during the lessons, meaning that learners were involved in classroom management as well. At the end of the lesson, the teacher asked the learners to state, if at all, they observed their peer-teacher making a mistake during the lessons. It appeared this was a time of self-reflection among the learners. They were evaluating what they knew and what the peer-teachers had just taught

them. Learners actively participated by giving suggestions on how best the peer-teachers could have presented their lessons. It was interesting that peers could spot some misconceptions during the lessons.

5.0 Main findings of the study

The results obtained from the questionnaire, written interviews, document analysis and observation checklists are reviewed in line with the demands of each research question as reviewed below:

5.1 Conclusion of the study

The study sought to establish the extent to which teachers, one for integrated science and one for mathematics, shared their classroom in pursuit of learner-centered instruction. The worldview used to understand this was the extent to which learners were involved in the four key result areas of teacher job description, and the type of power base that teachers used to control the teaching-learning proceedings. Results from the questionnaire and the interview showed that both teachers used the social power base (reward, legitimate and referent) to a larger extent. However, results from practical lesson observations indicated that teacher A mostly used the anti-social power base (coercive and legitimate power) while teacher B used the pro-social power base (reward, legitimate and referent). On learner involvement in the four key result areas, teacher B exhibited more learner- involvement than teacher A. Teacher B ceded most of his classroom power to the learners than teacher A. This suggests that teacher B was more learner-centered than teacher A.

5.2 Limitations of the study

The study involved two teachers of different personalities. The personalities of the two teachers could have had an effect on the results gathered since the researcher had no capacity to make personality a constant factor. The conditions for data collection were uniform in order to come up with similar data.

5.3 Implications of the study

This study suggests that learner-centered education can only be fully tapped through teacher-power devolution in planning, teaching, classroom management and class work evaluation. Learners must be involved in all the four key result areas, unlike where they are only involved in a fraction only.

5.4 Recommendations of the study

There is need to carry out the study on a large scale on teachers reputed for learner-centered instruction in order to establish the degree to which they teachers cede their classroom power to their learners. There is also need to find out the impact of teacher-learner power sharing on learner performance in integrated science and mathematics. Another study can be carried out on the impact of teacher-learner power-sharing on the attitude of learners to learning integrated science and mathematics.

5.5 Acknowledgements

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