Collaborative Teaching of Mathematics in the University: Prospective Teachers’ Perceived Pedagogical Benefits
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Abstract
We report on collaboration between two teacher educators who taught an approved 3-credit-hour mathematics course using a collaborative teaching approach for a full semester of 16 weeks. This was to find out the prospective teachers’ perceptions of the pedagogical benefits of team teaching in a Ghanaian public university that runs, among many others, a generalist program in basic education. The question we sought to answer was: “What are the prospective teachers’ perceived pedagogical benefits of team teaching of Mathematics in the university? The population for the study consisted of 203 third-year prospective teachers who were preparing for a full semester of internship. Forty (40) of these were sampled using systematic random sampling technique. They responded to open-ended questionnaires. Out of the 40 respondents, 10 were engaged in a focus group interview to deepen understanding of emerging issues. The mixed methods approach adopted enabled the analysis of data to be done quantitatively and qualitatively. It emerged from the analysis of both questionnaire and interview data that team teaching, among others, promoted students’ interaction with teachers; increased support given to students; engendered the use of variety of teaching strategies and promoted students conceptual understanding of mathematics. However, in terms of challenges, prospective teachers identified relatively high levels of partner teacher interruptions and time management concerns. Based on the findings we recommend its use in university setting while enjoining future collaborators to do effective planning to reduce interruptions and to manage time more effectively.

Key words: Collaborative teaching, Pedagogical benefits, Prospective teachers’ perceptions
Introduction
There are growing calls for collaboration in the delivery of instruction at all levels of the educational system since several studies indicate that collaboration within the school system leads to improvement in academic achievement of students (McLeskey and Waldron, 2007; McDuffie, Mastropieri and Scruggs, 2009) and for promoting collegiality (Leavitt, 2006). One of such collaborations in the educational setting is team teaching which has a history of over four decades (Day and Hurrell, 2012).

While team teaching as a collaborative method is well known to teachers in Ghana, its practice, for reasons unknown, has become almost extinct. That there seem to be no accessible scholarly articles that have documented the practice coupled with the negative responses obtained from informal discourse with school teachers suggest that it is a never-considered option. In other jurisdictions where team teaching is practiced or experimented in different educational settings—primary, middle (junior high) and secondary, and university, modest gains have been recorded. In Ghana, it appears team teaching is neither popular in the basic schools nor the universities. This situation is different from what pertains in United States of America where the practice is very common at all levels, most especially at the middle schools and the universities (Cowan, Ewell, and McConnell, 1995; Leavitt, 2006).

Studies have shown that team teaching has several benefits. For instance Wadkins, Miller, and Wozniak (2006) argue that the presence of more than one instructor in the classroom increases the occasions for student-teacher interaction. Also, Leavitt (2006) outlines some of the benefits of team teaching as:
(1) Creating a dynamic and interactive learning environment
(2) Providing instructors with a useful way of modeling thinking within or across disciplines, and
(3) Inspiring new research ideas and intellectual partnership among faculty.

Considering the afore-mentioned benefits one wonders why there are no genuine efforts at encouraging team teaching in Ghanaian schools and among intellectuals. When considered against the fact that a-2008 report on Ghana’s participation in Trends in International Mathematics and Science Study (TIMSS) pointed to the fact that the Ghanaian pupils perform poorly and that teaching methods did not promote effective learning (Anamuah-Mensah, Mereku, Ghartey-Ampiah, 2008). This implies that we need to explore other teaching methods and strategies which are not traditionally used in the Ghanaian classroom and one of such strategies worth considering is team teaching.

While the team teaching experimentations are rife in the developed countries and modest gains have been reported or made; not much has been done in the Ghanaian setting especially at the tertiary level. It should be of interest to explore how collaborative teaching in the form of team teaching in the tertiary setting in Ghana can improve teaching and learning. In this context we explore prospective teachers’ perceptions about team teaching having been taught a whole semester’s course using the blended model of team teaching.

This study therefore explored prospective teachers’ perceptions of team teaching of mathematics by identifying some of the pedagogical strengths and/or weaknesses of team teaching as a strategy for teaching mathematics. The study was thus guided by the following research question:

- What are the prospective teachers’ perceptions of the pedagogical strengths and weaknesses of team teaching of mathematics in the university setting?
This study adds to the theoretical knowledge on team teaching and its pedagogical practices as well. Practicing teachers and other stakeholders of mathematics education will find the study useful in improving classroom teaching in an era of recurring poor performance of students in mathematics at the pre-tertiary level especially in Ghana.

**Literature review**

We reviewed relevant literature by looking at team teaching as a form of classroom collaboration, defined team teaching and identified the various models, outlined some of its benefits and examined team teaching in the teacher education context. Further, we established a theoretical base for team teaching within the situated learning model and drew implications for the study.

**Team teaching as classroom collaboration**

Collaboration is in vogue in the educational setting for many reasons and these include improving efficiency, providing effective educational leadership, confronting emerging changes in education, and promoting systemic growth and accountability (Atkinson, Springate, Johnson & Halsey, 2007; Rubin, 2009). In the area of education, collaboration in terms of classroom teaching and learning takes various forms. It could be termed co-teaching in an inclusive setting. That involves a specialist teacher partnering a regular classroom teacher and providing support for exceptional students in mainstream or normal classroom settings (Carter, Parter, Jackson and Merchant, 2009; Alquraini and Gut, 2012). Co-teaching also involves two teachers sharing the same classroom but not necessarily sharing the same lesson (Cook and Friend, 1995) or team teaching, which involves sharing the classroom as well as planning, teaching and assessing of a particular lesson together (Goetz and EGallery, 2000).

**Definition and models of team teaching**

We view team teaching as one of the collaborative approaches used in the classroom. In this context teachers come together as a team to deliver classroom instruction. Team teaching in this respect is seen as group of two or more teachers working together to plan conduct and evaluate learning for the same group of students (Deighton 1971, cited by Day & Hurrell, 2012). Armstrong (1977) identifies four organizational patterns of team teaching as follows:

1. **Team leader type**- In this arrangement, one team member has a higher status than the other(s). He may well have a special title as ‘team leader’.
2. **Associate type**- In this arrangement there is no designated leader. Leadership may be expected to emerge as a result of interactions among individuals and given situations.
3. **Master teacher-beginning teacher**- In this arrangement team teaching is used to foster acculturation of new staff members to the school.
4. **Coordinated team type**- In this arrangement there is no joint responsibility for a common group of youngsters. What is involved is joint planning by two or more teachers who are teaching the same curriculum to different groups of youngsters.

An alternative classification of models of team teaching derived by Day and Hurrell (2012) from models espoused by Maroney (1995) and Robinson and Schable (1995) identified six basic models of team teaching depending on the teachers and learners in a particular setting. These are as follows:

1. **Traditional team teaching**- Teachers actively sharing instruction to all students.
2. **Collaborative teaching**- Teachers working together, design a course and teach the material by exchanging ideas and theories in front of the students. It usually involves the use of group learning techniques for the learners.

3. **Complementary/Supportive team teaching** - One teacher being responsible for teaching the content while the other does follow-up activities on related topic and study skills.

4. **Parallel instruction** - A class split into two halves and each teacher being responsible for teaching the same material to each group.

5. **Differentiated split class** - A class is divided into smaller groups based on learning needs and each teacher provides a respective group with instruction required to meet the identified learning needs.

6. **Monitoring teacher** - One team member is responsible for teaching while the other moves round to monitor and assist students.

Our adopted model is the associate type based on Armstrong’s (1977) organizational pattern of team teaching. We also consciously used a blend of the traditional; collaborative and monitoring teacher team teaching models to provide content-rich and engaging learning environment that we believed would impress prospective teachers with its strengths in improving students learning and teacher growth. We note here that Day and Hurrell (2012) used a combination of these models in a tertiary setting in the area of mathematics and found that team teaching among others provided dual perspectives; provided a model for collegial pedagogy and flexibility of approach.

**Team teaching in teacher education and its benefits**

There are growing calls for quality teacher education across the globe. It is believed that the way teachers are prepared to a large extent determines their quality and their ability to translate what they have experienced into the real classroom situations. It has become a jargon and echoed by Friel and Bright (1997, p.19) that “teachers teach the way they are taught” and this seems to mirror the situation in the Ghanaian context. The implication is that teacher preparation should be conducted in such a way that prospective teachers are exposed to what they are expected to deliver after their preparation. However, in terms of pedagogy, the general perception is that prospective teachers are theoretically exposed to several strategies of teaching without any experiential knowledge of them. It is obvious from the above assertion that prospective teachers are bound to display deficiency in the application of such practical approaches in the real classroom situations.

Team teaching as an approach has been taunted as effective for almost all subject areas including mathematics and at all levels of the educational system because of its multiple benefits. Aside the benefits outlined by Leavitt (2006), Welch (2000) and Arhar, Johnston and Markle (1988) confirm that team teaching improved students’ behaviour, decreased discipline problems and improved academic performance. Shibley (2006) posits that there is no doubt that members in a teaching team can learn from each other (or one another) about the content as well as the pedagogy throughout the team teaching experience. From this statement, we can deduce that team teaching is a model in its own right. The implications for teacher education are that prospective teachers will obviously see this as a model for collegial collaboration and as an effective pedagogical model for improvement of students’ learning of mathematics content.

We therefore establish a theoretical base for team teaching, as an instructional model for prospective mathematics teachers, within the Situated Learning Model-which has the elements of building collegiality and fostering group learning and matches learning context to the context
in which what is learned is to be applied. We do this by first defining situated learning and then build a link between team teaching and the situated model within a teacher education context.

The Situated Learning Model
The proponents of the situated learning, Lave & Wenger (1991), argue that learning takes place in contextualized situations similar to the real life situations in which the learners are supposed to apply what they have learned. They view learning as a social process in which learners and teachers engage one another as a “community of practice”. This means that social engagements create the proper context for learning to occur in a community of practice. Here members interact to create meaning (contextualized body of knowledge) from contexts similar to real life situations. Stein (1998) adds that in the situated learning approach, knowledge and skills are learned in the contexts that reflect how knowledge is obtained and applied in everyday situations.

Though Stein (1998) further posits that situated learning does not have precise models or prescriptions for learning in a classroom setting, they are however premised on four principles in terms of guiding the development of classroom learning activities. These are: (1) learning is grounded in the actions of everyday situations; (2) knowledge is acquired situationally and transfers only to similar situations; (3) learning is the result of a social process encompassing ways of thinking, perceiving, problem solving, and interacting in addition to declarative and procedural knowledge; and (4) learning is not separated from the world of action but exists in robust, complex, social environments made up of actors, actions, and situations. These elements provide sound bases for the use of team teaching as a strategy to teach prospective teachers-both as a way of teaching the mathematics content and exposure to mathematics pedagogy.

Linking situated learning and team teaching
How does team teaching relate to situated learning? To Stein (1998) , “to situate means to involve other learners, the environment, and the activities to create meaning”; “…to locate in a particular setting the thinking and doing processes used by experts to accomplish knowledge and skill tasks …” and “to create the conditions in which participants will experience the complexity and ambiguity of learning in the real world”.

Teaching of prospective teachers by teacher educators using the team teaching approach amounts to exposing the prospective teachers to what practically they as expected to do as teachers .This models team teaching to prospective teachers thus creating a situation similar to what they are likely to meet in their future classrooms. This is a departure from the mere verbal expositions which simply reduce learning to a transmission of abstract and de-contextualized knowledge. The engagement aspect of situated learning is mirrored in the interactions that go on between the teacher educators and prospective teachers who participate in the team teaching process thus constituting a community of practice.

According to Lave and Wenger (1991), learning is not only situated in a specific context but also embedded within a specific social and physical environment. In terms of team teaching, the classroom setting, in this context, provides the physical environment while the teacher educators, prospective teachers and the interactions (engagement) which go on amongst them constitute the “social environment”. We concede, in this case, that both the physical and the social environments are contrived, since the team teaching setting is not the real classroom setting that prospective teachers are likely to practice.
Team teaching also provides an opportunity for prospective teachers to experience at first hand the “thinking and doing processes used by experts”. This expert modeling is provided by the teacher educators. The situated learning model therefore provides a sound theoretical base for the practice of team teaching in a teacher education setting which if properly designed and harnessed would enhance teaching and learning of mathematics content as well as the exposure of prospective teachers to some practical teaching strategies.

Methodology
The participants involved in the study were two hundred and three third year students preparing for a full semester of internship as part of the requirements to become certified generalist basic school teachers. These prospective teachers responded to a semi-structured questionnaire and out of these, forty students, constituting about twenty percent (20%) were randomly sampled and 10 of them engaged in a focused group interview afterwards. The focus group interview was used to probe emerging issues and seeming contradictions. We used systematic random sampling to obtain the sample by serializing the 203 completed questionnaires and every fifth was selected to form the sample of 40 students. This was done after a full semester of 16 weeks of having been taught an approved 3 -credit-hours Mathematics course using the blended team teaching approach by two teacher educators. This study was conducted in a Ghanaian public university that runs, among many others, a generalist program in basic education.

Content and construct validity of the questionnaires were ensured through subjection to expert scrutiny- by an associate professor and a senior lecturer in mathematics education and their inputs were used for refinement. The calculated reliability (internal consistency) of the instrument yielded a Cronbach alpha coefficient of 0.83, which is deemed very reliable (Cohen, Manion and Morrison, 2007).

Data collection and analysis
Data were gathered through a semi-structured questionnaire and focus group interview yielding both quantitative and qualitative data which was analyzed using the mixed methods approach. Response to items were categorized as being ‘high’ ‘medium’ or ‘low ’ using constructs developed by the researchers. The data obtained from questionnaires were analyzed manually and presented using a table showing absolute values and their respective percentages. We used the interpretive technique to analyze data obtained from the focus group interview as a way of confirming or disconfirming that obtained from the questionnaires.

Results and discussions
We present the data on the perceived pedagogical benefits of team teaching of Mathematics in the university setting in Table 1. The table shows the absolute number of respondents and the corresponding percentages. In discussing, we support our findings in the table presented with the data obtained from the focus group interview.
Table 1: Prospective teachers’ perceived pedagogical benefits of team teaching of Mathematics in the university.

<table>
<thead>
<tr>
<th>Benefits (In terms of…)</th>
<th>HIGH</th>
<th>MEDIUM</th>
<th>LOW</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>1. Effective use of time</td>
<td>21</td>
<td>52.5</td>
<td>4</td>
<td>10.0</td>
</tr>
<tr>
<td>2. Class control and management</td>
<td>26</td>
<td>65.0</td>
<td>6</td>
<td>15.0</td>
</tr>
<tr>
<td>3. Support given to students</td>
<td>33</td>
<td>82.5</td>
<td>6</td>
<td>15.0</td>
</tr>
<tr>
<td>4. Teachers’ interaction with students</td>
<td>34</td>
<td>85.0</td>
<td>3</td>
<td>7.5</td>
</tr>
<tr>
<td>5. Students’ participation</td>
<td>29</td>
<td>72.5</td>
<td>7</td>
<td>17.5</td>
</tr>
<tr>
<td>6. Use of varieties of strategies</td>
<td>36</td>
<td>90.0</td>
<td>3</td>
<td>7.5</td>
</tr>
<tr>
<td>7. Pacing of lessons</td>
<td>21</td>
<td>52.5</td>
<td>4</td>
<td>10.0</td>
</tr>
<tr>
<td>8. Level of disruptions/interruptions</td>
<td>17</td>
<td>42.5</td>
<td>14</td>
<td>35.0</td>
</tr>
<tr>
<td>9. Organized/systematic delivery</td>
<td>21</td>
<td>52.5</td>
<td>10</td>
<td>25.0</td>
</tr>
<tr>
<td>10. Conceptual of understanding</td>
<td>33</td>
<td>82.5</td>
<td>2</td>
<td>5.0</td>
</tr>
<tr>
<td>11. Attention to individual students</td>
<td>30</td>
<td>75.0</td>
<td>6</td>
<td>15.0</td>
</tr>
<tr>
<td>12. Response to students’ questions</td>
<td>34</td>
<td>85.0</td>
<td>4</td>
<td>10.0</td>
</tr>
</tbody>
</table>

Note: The values for medium include those who did not respond to the item.

Discussion of findings
On the benefits in terms of effective use of time, 52.5% of the respondents thought that team teaching ensured effective use of time. About 10% of the respondents were opinionless, while the remaining 37.5% thought that team teaching was time-consuming. The responses during the focused group interview confirmed the divergences of opinions in terms of how effectively time was used. One group states:
“Well, it was okay because after the lessons we understood the concepts so time was well managed. Also, sometimes when one teacher gets tired the other comes in avoiding waste of time”.

Others disagreed and gave reason as follows:

*It was time-consuming and this was due to the frequent repetitions by the lecturers which posed a barrier. Besides, a lot of time was used to explain the same concept by each lecturer*.

Clearly respondents had contrasting views as to how time was used based on the different perspectives. One group looked at the end result of the use of the time whilst the others considered the seeming repetitions as interruptions. When asked what their suggestions were, the respondents suggested that time must be allocated to each lecturer so they do not interrupt each other and apportion aspects of the topic to each lecturer to reduce repetitions. At first glance it might seemed a good suggestion but it runs contrary to the tenets of the collaborative team teaching model (unknown to them) adopted for the study which required that the team members teach the material by exchanging ideas and theories in front of the students and between the teachers and the students (Ercolano, 2008).

It is evident from Table 1 that 65% of the respondents were of the view that there was effective class control and management, while 15% thought that class control and management was average. The remaining 20%, however, thought that class control and management was not effective. The focus group interview revealed that respondents felt class control and management was effective. They stated that:

“Class control and management was good. There was discipline and comportment and students participated. Almost all the students were focused on the lecturers. Apart from that sometimes one lecturer moves round to assist students in difficulty preventing others to misbehave”.

When asked to provide reasons they clarified that it was better as compared to one teacher because whiles one teacher was teaching, the other was monitoring. This suggests that respondents viewed the monitoring aspect of team teaching as very effective in the management of a class. This confirms the findings, though in a middle school, of Arhar, Johnston and Markle (1998) that team teaching improved students’ attitudes and decreased discipline problems.

In terms of support given to students, 82.5% of the respondents conceded that team teaching ensured the provision of support to (individual) students. Six respondents, constituting 15%, did not respond, while the remaining 2.5% of the respondents felt there was no significant support given to students. The respondents were of the view that adequate support was given to students during the lessons. They expressed their view as follows:

“There was enough support to students because the two lecturers were teaching and at the same time going round to supervise so students were attended to adequately. This was very encouraging because the other lecturer had enough time to attend to lost students. Individual problems were identified and help was provided as the second lecturer moved round and attended to students”.
Clearly, respondents perceived that team teaching is effective in providing support to students as a result of the monitoring roles played by both lecturers synchronous to teaching.

On teachers’ interaction with students, 85% of the respondents agreed that the team teaching sessions ensured effective (high) interaction between teachers and students. About 7.5% of the respondents said interaction between teachers and students was rather low. The remaining 7.5% of the respondents remained neutral. On the effectiveness of the interaction between teachers and students, the respondents during the focus group interview opined:

“It was excellent and very effective because the two lecturers had time to interact with many students especially when both are not in front of the class at the same time. The other lecturer going round explained a lot of things to the students who were struggling while the other goes along with those who understood the concepts”

This is another allusion to the enhanced teachers-student interactions brought about by the monitoring role that the team teaching partner brings to bear on teaching using the team teaching model and how it promotes learning. This is in agreement with Wadkins, Miller, and Wozniak (2006) observation that the presence of more than one teacher in the classroom increased student-teacher interactions.

With respect to students’ participation, 29 (72.5%) of the respondents felt that students’ participation in the lessons was high. Seven (17.5%) of the respondents remained neutral, while the remaining 4 (10%) respondents felt students’ participation was low. From the focus group interview, apart from a respondent who intimated that the participation was less than as expected the respondents unanimously agreed that there was effective participation of students in the lessons and this was expressed as follows:

“The participation of students in the lessons was high. This was because we were involved in the development of the concepts and we could come in with our ideas even when the two lecturers were discussing it. Also, the lessons were based on our previous knowledge so we could say something”.

From these views expressed, the respondents perceived students’ participation in a lesson in terms of the opportunity that is provided them to contribute the topic at stake. While this may not be exclusive to team teaching, respondents felt that building a lesson on students’ previous knowledge facilitated their participation in the lessons.

In terms of the use of variety of strategies 36 (90%) of the respondents agreed that variety of strategies were used in the lessons, 3 (7.5%) of the respondents were neutral and 1 (2.5%) of them felt that there was no use of variety of strategies in the lessons. It emerged from the focus group interview that respondents overwhelmingly thought that variety of strategies were employed during the lessons. They stated that:

“Each lecturer came in with his approach and this varied the teaching methods and strategies. The different teaching methods used enhanced our understanding and made topics interesting and easy to retain”.

It is clear from the perspective of respondents that collaborative team teaching ensured that varieties of strategies were used in teaching lessons and this promoted conceptual understanding.
Students’ impression about the pacing of the lessons was varied. Twenty-one (52.5%) indicated that the pace of the lessons were so high. Four (10%) thought they were normal and 15 (37.5%) felt that the pacing was low. Further, the focus group interview showed the split in views. A few felt it was normal however the majority of respondents felt that the lessons were fast paced. They expressed their views as follows:

“The lessons were very fast paced such that if you are not very attentive you will miss a lot of things. The way people were coming into the discussions also added to it so you needed to be alert”.

This is contradictory if considered against their agreement that the lessons promoted conceptual understanding. Aside, they agreed that their questions were patiently and thoroughly handled and further clarifications were given. It gives the impression that the respondents did not understand the concept of pacing since it should be relative to the level understanding gained.

On students’ perception of levels of disruptions/interruptions, 17 (42.5%) indicated that disruption/interruption was high, 14 (35%) were either opinionless or felt that it was normal, and the remaining 9 (22.5%) felt it was low. The focus group interview revealed differences in opinion. One group, clearly in the minority, perceived that the disruptions were minimal and indicated that:

“The disruptions were minimal and should be expected since the whole class was involved in the discussions. This is what also made us to understand the lessons so it was not as bad as others think”

The majority disagreed and expressed their views as follows:

“I would say interruptions were very high. There were so many interruptions even between the two lecturers since they did not come in at the right times. This made the class look as if things were not in order”.

Obviously the majority of the students perceived collaborative team teaching as full of disruptions. This seems to confirm Ramey’s (1992) finding though among fifth and sixth graders, that some students felt uncomfortable with team teaching and experienced some difficulties. These are not strange observations since the collaborative model requires such interventions during interactions though not disorganized ones. The interventions may have been wrongly perceived as interruptions by respondents.

Of the respondents, 21 (52.5%) felt the lessons were organized and systematically delivered, 10 (25%) felt it was normal, and 9 (22.5%) felt that lesson organization and its systematic delivery was low. The focused group interview revealed that the respondents were divided in their view points. However, the slim majority thought the lessons were organized and systematic. Those who disagreed indicated that:

“As for the systematic nature of the lessons it was not so much a bother but the lessons were not organized. This is because there were so many interruptions and disruptions”. 
The majority opined:

“It depends on how you see it; it was quite organized than the previous lectures. I learned a lot because the lessons were delivered systematically and we benefitted from the discussions of the lessons from different angles”.

The focus group interview revealed that the disorganized nature perceived by students suffered from the hallow effect of their perception that the lessons were full of interruptions. While those who viewed it as being systematic and organized viewed it from the level of understanding gained from supposed interruptions and disruptions.

Regarding the promotion of conceptual understanding, 33 (82.5%) of the respondents indicated that it was high, 2 (5%) of them maintained neutrality and 5 (12.5%) of the responded indicated that promotion of conceptual understanding was low. Students overwhelmingly agreed during the focus group interview that conceptual understanding was promoted. They viewed it as follows:

“Conceptual understanding was high because the lessons were made practical and various ways of answering questions were used. We proved concepts before using them in problem solving questions. They also gave different methods and approaches for solving the same problem so students had options. It gave divergent ideas and insights and these went down very well with us”. This was far better than being taught one method by one lecturer.”

Respondents perceived that collaborative team teaching promoted conceptual understanding by exposure to practical activities, variety of approaches-as a result of different perspective from two teachers and the application of what has been learned.

In terms of the attention given to individual students, 30 (75%) had the impression that attention given to individual students was high, 6 (15%) felt it was normal, and 4 (10%) felt it was low. It emerged from the focus group interview that students felt that enough attention was given to individual students. They stated:

“Enough attention was given individual students, as one teacher was teaching the other was going round to see how students were working, thereby giving attention to many students. Yes, the attention given to individual students was good and far better than one can receive with one teacher”.

Respondents thought that attention for individual students was relatively better in team teaching than when taught by a single teacher. This is largely attributed to the monitoring role of the team members. This agrees with Leavitt (2006) establishment that team teaching creates a dynamic and interactive learning environment.

Lastly, teachers’ response to students’ questions was rated highly by 34 (85%). Of the remaining, 4 (10%) rated it to be normal, and 2 (5%) rated it to be low. The focus group interview revealed that respondents agreed that students’ questions were adequately responded to by teachers. They opined:
“The teachers responded to questions posed by students. There were times that after one teacher had responded to a question, the second would explain further using a different way. It is far better as compared to one teacher. The lecturers had patience to respond to students’ questions and gave opportunities for students to ask for clarifications. In a way, students felt relaxed to ask questions because the teachers were ready to answer them”.

It is obvious that team teaching promoted the effective handling of students’ questions as a result of having two teachers thus students benefitted from further clarifications. As for the patient manner in which teachers handled the questions, it is attitudinal and could be contrived by the lecturers, conscious of the study they were engaged in.

**Conclusion**

Using the criteria 75% -100% as high rating, from 50% - below 75% as average rating, and below 50% as low rating, the perceived pedagogical benefits of team teaching that was highly rated by the prospective teachers (in descending order) include: the use of variety of strategies (90%), teachers’ interactions with students (85%), teachers’ response to students’ questions (85%), supports given to students (82.5%), promotion of conceptual understanding (82.5%) and attention given to individual students (75%).

The averagely rated benefits include: students’ participation in lessons (72.5%), class control and management (65%), effective use of time (52.5%), organized and systematic delivery (52.5%) and pacing of lessons (52.5%). The poorly rated is its effectiveness in controlling the levels of interruptions/disruptions (42.5%).

We therefore conclude that collaborating team teaching using the blended model has a lot of pedagogical strengths in terms of increased students’ interaction with teachers; increased support given to students; engendered use of variety of teaching strategies and promoted students’ conceptual understanding of mathematics. However, in terms of challenges, prospective teachers perceived relatively high levels of partner teacher interruptions; fast pace of lessons, poor organization of lessons and time management concerns.

**Recommendations**

Based on the findings, we make the following recommends:

1. Team teaching should be used to teach prospective teachers in the university setting as a way of teaching both mathematics content knowledge and modeling pedagogical strategies.
2. We enjoin future collaborators who want to try out the blended model to do effective planning to reduce the perceived interruptions/disruptions and to manage time more effectively.
3. Other models of team teaching should be tried out in the university setting to see what findings would emerge.
4. Team teaching should be encouraged by the university administration because inherent in it is informal professional development which builds collegiality. It creates the platform for subjection of one’s knowledge to some peer scrutiny. It requires the giving up of one’s professional autonomy or space and making adjustments which end up promoting efficiency in teacher education delivery.
References


