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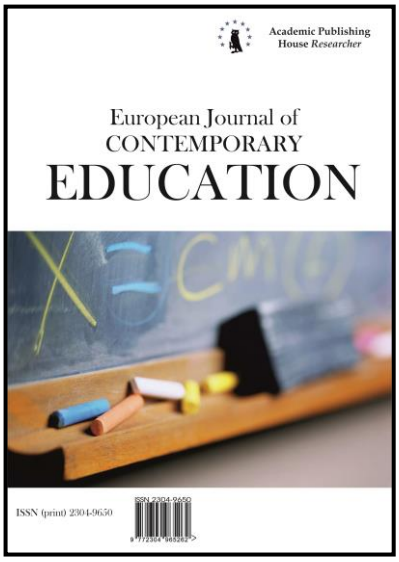

The Problems of Contemporary Education

After-School Mathematics Tutorials in Ghana: A Qualitative Study on Senior High Students' Psychosocial Experiences

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Abstract

Mathematics is an important subject in senior high education as it forms the basis for most taught subjects. In Ghana, it is a common practice to find parents enrolling their children in private after-school mathematics tutorials. Teachers who teach after-school tutorials usually organize class after school hours or during the weekends for a fee. Also, teaching can take the form of one-to-one private tuition or group tuition. Although after-school mathematics tuition has become a common practice, little is known regarding the experiences of these senior high students who receive this tuition in Ghana. We purposively sampled 35 senior high students from public schools for both individual and group interviews. Using interpretative phenomenological analysis, we observed that private tutorial learning in mathematics increased students' understanding of the subject. Students who had this extra tuition also expressed a dramatic improvement in their performance in mathematics. Nevertheless, we observed that students felt bored when there was a repetition of topics that had already been taught in class. Furthermore, we observed that participants perceived this additional tuition as an additional academic stressor as it prevented them from having adequate rest and extra-curricular activities. We recommend that the Ministry of Education, Ghana Education Service, and other stakeholders should regulate the private after-school mathematics tutorials in Ghana.

Keywords: after-school tutorials, Ghana, high school students, mathematics.

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1. Introduction

Ghana's educational system has evolved through many stages since colonial rule (Graham, 1971). Ghanaian basic education begins with two years of kindergarten, six years of primary education, three years of junior high education as well as three years of senior high education (Iddrisu et al., 2017). At all these stages of education, the teaching and learning of mathematics play an integral role (Adusei et al., 2016; Azigwe et al., 2016).

At the senior high education, mathematics plays a very essential role. Specifically, it forms about 63 % of their core and elective subjects in Ghana (Sarfo, Adusei, 2016). Most Ghanaian students attend extra classes in mathematics but little is known about their life-time experiences (Dennis et al., 2018). Often, after-school tutorials are privately organized by teachers and private educational institutions for a fee in Ghana and it is popularly called "extra-classes" (Sottie, 2017). According to Krishnaswamy et al. (2019), after-school tutorials can take these forms; "(i) one-to-one private tutorial teaching, (ii) school teachers who teach students after daily school, and (iii) professional private tutors who set up classrooms and operate the business by providing lectures to students." (p. 203).

In practice, the after-school mathematics tutorial refers to having organized teaching in mathematics outside the normal school contact hours. Though recommended by some Ghanaians in authority, others vehemently have condemned it, especially owing to the exorbitant fees teachers charge (Sottie, 2017). Like Ghana, 4 out of 5 school children in Shanghai also attend after-school tutorials groups in the evenings and at weekends (Organisation for Economic Cooperation and Development, 2010). The purpose of this current study is to explore the reasons, benefits, and challenges of students engaging in extra classes in mathematics in Ghana.

2. Materials and methods

Participants

Thirty-five (35) senior high students from different senior high schools in Ghana were purposively selected for either individual or group interviews (see Table 1). These students studied core and elective mathematics as part of their three-year senior high program. Twenty-seven participants were selected for the individual interviews until saturation while 8 participants were selected for the group interview. The gender disparity was objectively based on the availability and willingness of participants to participate. Their average stay in the school and the average ages were approximately 12 and 17 years respectively.

Table 1. Participants' data collection methods

Method	Number of Interviews
Individual interview	27 (17 male, 10 female)
Group interview	8 (3 male, 5 female)

Both individual and group interviews were done to ensure triangulation, quality interaction among homogenous groups of students since they were hesitant during the individual session to provide information (Creswell, 2013). Tables 1, 2 give summaries of participants' data collection methods, and participant demographics respectively.

Table 2. Participant demographics

Age (Years)	Total Number	Gender Distribution
15	3	1 male, 2 females
16	6	4 males, 2 females
17	22	12 males, 10 females
18	4	3 males, 1 female

Measures

We developed semi-structured interview guides for both individual and group interviews with assistance from a mathematics teacher. We also administered it out to 3 senior high students to ensure clarity and accuracy of items. Sample questions asked included: "have you taken core/elective mathematics extra classes before?"; "what are the reasons why you engaged in mathematics classes?"; "can you share the benefits of attending extra classes? Asking these open-ended questions allowed our study's participants the liberty to tell their story devoid of restraint. Additional prompts were used to enhance explanation and also to maintain. These questions were planned to aid interviewees to come out clearly with their experiences and their respective meanings rather than serving the goal of leading questions (Creswell, 2013). At the close of the interview, participants were asked a leading question; "is there something you feel is important that you want to add? This was done to get additional information. The one-on-one interviews lasted between twenty to thirty minutes per session while the group interview lasted for forty-five minutes.

Data Analysis

Concerning data analysis, all audio-recorded interviews were transcribed and simultaneously analysed manually using the interpretative Phenomenological Analysis until theoretical saturation (Creswell, 2013). To ensure confidentiality, fully transcribed interviews with names were completely anonymized and the participants were given codes to hide their identity. The purpose of this study was to ascertain the effect of extra-classes and performance in Mathematics in Ghana. The Interpretative Phenomenological Analysis was used to explore the experiences of sampled senior high students. This research method offers a methodical and explicit description of life-time experiences of subject matter (Creswell, 2013).

3. Results

At theoretical saturation, 2 main themes and 6 subthemes emerged during our analysis. Table 3 shows a summary of themes and their respective sub-themes.

Table 3. Thematic output of the summarized data

Themes	Sub-themes	Sampled quotes
1. Advantages of after-school math tutorials	i. Enhances understanding of math lessons [n=30]	"…after engaging in mathematics extra classes for three terms, mathematics questions have become easy to solve since more knowledge has been acquired." SRf5 "…improves my learning of math." SRf8
	ii. Additional period for math lessons and revision [n=35]	"It helps me to finish the term's syllabus very quickly and revise." SRf8
	iii. Improves performance in math tests [n=25]	"At first, my grades in mathematics were ranging between D7 -F9 but after taking extra classes in the third term of my second year, there has been an improvement to C5 and I am hoping for the better this year." SRm2

2. Disadvantages of after-school math tutorials	i. Boredom due to repetition of already taught lessons [n=28]	"My main aim of having extra classes was to supplement what is been done in class but if the same topic you have treated in class is been taught after class, it makes the lessons boring." SRm12
	ii. Extra tuition fee cost [n=22]	"I see myself as someone who needs extra tuition for most subjects but my parents could not afford the charges... so, I am only attending math tutorials for now." SRm10
	iii. Academic stressor [n= 24]	"...after-school math tutorials are normally done after our classes ... Students who engage in extra classes will always have less rest during the day and sometimes lead to stress" SRm2

Notes: n=number of sample for a particular sub-theme

4. Discussion

The goal of the study is to explore the experiences of senior high school students who patronise after-school mathematics tutorials in Ghana. Two major themes and 6 subthemes were observed after analysis. The findings indicated that after-school mathematics tutorials for senior high students in Ghana have several advantages. Consistent with the findings of Forrest et al. (2017), math tutorials augment students' understanding of math lessons that are taught during class. Also, students in this study reported that receiving after-school tutorials afforded them extra hours of math lessons and revision. Consequently, such tutorial periods offered students pleasant and relaxed moments to receive math lessons according to their pace (San Jose, 2019). Krishnaswamy et al. (2019) confirmed that the inflexibility of the Malaysian school system promoted students' preference for private tutorial learning.

Subsequently, most of the participants reported an improvement in their mathematics examination scores. In a report to improve the academic performances among disadvantaged students, an increase in individual tutorials was noted as the best remedy (Ander et al., 2016). According to Huang (2013), the national average performance of sampled countries in both mathematics and science increased when after-school tutorials were offered to students. Besides, studies by Butty et al. (2001) and Moreno et al. (2016) also pointed to these as benefits of after-school tutorials. Likewise, Kim and Park (2007) reported Korean parents enrolled their children in private tutorials to increase their chances of gaining admission to universities.

Aside from the advantages participants obtained from private after-school tutorials in mathematics, they reported some key disadvantages. Some of the participants reported that they experienced some level of boredom when lessons that are taught during school hours are repeated at private tutorial learning. In an electroencephalograms (EEG) study of learners' brain waves, EEG changes when students were bored. The boredom of students, according to researchers was attributed to the repetition of the same lessons (Katayama, Natsume, 2012).

Additionally, some of the participants complained that their parents could not afford the fees charged by their after-school tutorials' teachers. Confirmed by Qian (2014), after-school tutorials place an undue financial burden on parents, particularly among poor families. In Ghana, media reportage by Sottie (2017) noted that the Regional Director urged teachers not to charge fees for after-school tutorials. This directive seems impossible until teachers are well paid and better education policies are enacted (Ille, Peacey, 2019). Furthermore, most of the participants reported less rest after class because they have to attend after-school tutorials. They complained that this led to an increase in their levels of academic stress. Studies over the years have outlined the negative

effect that academic stress has on the quality of life of students (Bedewy, Gabriel, 2015; Jayanthi et al., 2015).

5. Conclusion and recommendations

Mathematics forms an essential part of Ghana's senior high education. We noted from our findings that students in Ghana engage in after-school mathematics tutorials due to its benefits. Our study revealed that private mathematics tuition classes help students to understand math lessons well and improve academic performance. Notwithstanding these advantages, some participants also reported challenges like boredom, financial burden, and academic stress as some of the negative effects of this form of tuition. In the future, the government and stakeholders in education must enact policies and systems to regulate after-school tutorials for senior high students in Ghana. Furthermore, the government should provide teachers with incentives and adequate salaries to discourage them from charging students exorbitantly for private after-school tuition.

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7. Conflict of interest

The authors declare that there was no conflict of interest.

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