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Emerging Patterns in Students-Parents Interaction Interfaces and Platforms' Use in Kenyan Secondary Boarding Schools

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Abstract– In Kenya, the Ministry of Education banned the use of mobile phones by students while they are in boarding schools without replacing it with a suitable interaction interface. This situation infringes on children's right to information, as delineated in the child right commission (CRC) which include the right to be heard and to be taken seriously, to free speech and information, and to maintain privacy. There is need for a suitable replacement to letter writing, and direct mobile phones use in secondary boarding schools. This study surveyed student-parent interaction needs so as to come up with computer-based interaction requirements that would enable the development of automated suitable interaction platform between the parents and the students. The study objective was to examine existing students-parents interaction methods and platforms used in secondary boarding schools in Rachuonyo South Sub-County, in Kenya. Specifically, the study investigated time periods of interaction, whom they interacted with and problems prompting the interactions. Stratified random sampling was used in which sample size of 330 students, 178 parents and 8 teaching staff were investigated. The data collected were descriptively and inferentially analyzed using SPSS and MS-excel applications. The study findings showed that a bigger percentage of the students use mobile phone platform to interact with their parents despite the ministry's ban. 95.5% of students use mobile platforms to interact with their parents, less than 5% use letters or electronic mail. Most of the students (98.6%) got mobile phones from their teachers, 0.93% from the support staff and 0.47% from their fellow students. Almost half of the students (49%) interact termly with their parents a clear indication that there is need for students –parent interaction interface while they are in boarding schools. Parents and students (80%) concurred that the best time for student parent interaction in schools is 4:10 pm – 6:00 pm. Majority of the students (80%) had interacted with strangers. On the frequency of problems that prompt students to do mobile phone-based interaction, 98.6% of the students mentioned school fee, course books 89.7%, revision books, 80.8%. It also noted that 74.1% of students called their parents to inform them about their performance, 50% over exercise books for doing extra work, 48.2% on health issue, stress (47.8%), Career choice Students (43.3%), exam performance 22.8%, food related problems (19.2%) and 10% complained about special meals. Few students, 6.25% mentioned bullying. Generally, most students interacted because of financial problems (74.1%) followed closely by academic (71.1%) and lastly (33.2%) social problem. This study recommends the need for design of an interface in which each student had an account and logged in using log in credentials and

priority in the interface design be given to financial problems and academic issues. The ministry of education and the school head teachers need to allocate funds for provision of a special room for computer to be installed with interaction interface to enable each student get an opportunity to interact with their parent between 4 pm to 6 pm, the teacher on duty be charged with additional responsibility of guarding and supervising student-parent interaction process.

Index Terms– Interface, Integration, Student-Parent and Platforms

I. INTRODUCTION

EFFECTIVE interaction interfaces are important for development of any learning institution. It is the process by which meanings are understood and perceived. Parents and teachers tend to consider the importance of big talks, about significant topics with children but the ability to connect when it really matters is often based on the ability to connect when it doesn't. The way a parent or a teacher relates to a teenager in day to day life will make it easier or harder to sort out the key issues. Effective interaction bridges the gap between children in secondary boarding schools and their parents, giving parents easy time to address their children's problems' both when they are in schools and at home [7].

Over the years, government of Kenya has purposely expanded the number of boarding schools in the country to enable access to quality and relevant system of education and training. It has also offered opportunity to nearly all Kenyan children therefore ensuring equity. However, the boarding schools have posed many challenges to the schools' administrators, parents and the schools' stakeholders. The ministry of education has tried to address the challenges faced by secondary boarding schools by defining the problem and determining the cause with the aim to offer a solution. On July 23rd, 2008, the Kenyan government banned the use of cell phones [6] by primary and secondary schools' children as a string of riots hit schools across the country [14]. Also prohibited candidates from using mobile phones during examination period; this policy has only been partially implemented as it would completely cut off interaction

between parents and their children in boarding school. Other options like letter writing are not very convenient especially in this error where people hardly visit post offices to check for letters. There is however no doubt that parents play a major role in supporting their children's learning. There should be a clear policy on student-parent interaction interfaces and platforms while in boarding schools [4].

Most guidance for services for children, like safeguarding and health care emphasize how important it is to listen to the wishes of the child. That is why, though it is illegal, schools' administrators still allow students to interact with their parents through cell phones platforms. Currently the cell phone platform is one of the most available efficient means of student-parent interaction, therefore teachers often facilitate the interaction process because they are not in a position to solve all the students' problems. Some schools in Spain and Singapore use interaction interface systems like E-book system and classroom webpage in student-parent interaction [8].

The secondary public boarding schools therefore need a suitable alternative to cell phones interfaces, thus there was a need for this study to enable design and develop a suitable automated student-parent interaction interface which offers reliable timely and accurate interaction between parents and students while in secondary boarding schools. Suitability of an interface is its ability to meet the user's need. If a product fails suitability test, then it does not offer the features and functions required by the user. The suitability of a product becomes superfluous as it enables the users achieve their goals [11]. Likewise, the International Organization for Standardization (ISO) defines interface suitability as the extent to which an interface can be used to achieve specified goals with satisfaction, efficiency effectiveness, and in a specified context of use. There is need to achieve specified interaction goals with satisfaction, efficiency effectiveness, and in a specified context of use in the boarding secondary schools. A suitable student-parent interaction interface should promote a safe environment at school and help students make good decisions. Despite the existing technologies that can secure, restrict access and assure privacy as those used in other disciplines like health and electronic funds transfer, education and learning environments are yet to benefit from such secure and restrictive interaction interfaces. The study was carried out in Homa Bay County, Rachuonyo South Sub-County, the county was purposely chosen because of recent spates of student unrests in the boarding schools in the Sub-County. The research was carried out to examine the existing and emerging students-parents interaction methods and platforms used in boarding secondary schools with the aim of designing automated interaction platforms. The rest of the sections of this is organised as follows; section A, reviews literature on the existing student-parent interaction interfaces and platforms and theoretical framework. Section II is about the research methodology, while section III reports the findings and results and discussion, finally section IV concludes and give recommendations based on this study.

A) Existing Student-Parent Interaction Interfaces and Platforms

There are new emerging ways in which students and parents and teachers are have innovatively interacted globally. Some of these student interaction platforms and interfaces include: classroom webpage, BuzzMob, the Teacher App & Grade Book, Collaborize Classroom, and Remind 101. This section review these platforms with and aim identifying suitable interface for student parent interaction while in boarding schools

Classroom webpage

The classroom webpage has been a success in Spain and Singapore. According to [3], using a classroom webpage can allow the learning process to take place anytime and anywhere. Students can access class notes and curricular resources even when they are at home. Parents and students can see what is being taught during the year. This can be useful to help the parents monitor their children's progress and find out in case there is a problem. Fig. 1 shows a sample of the classroom web page application.

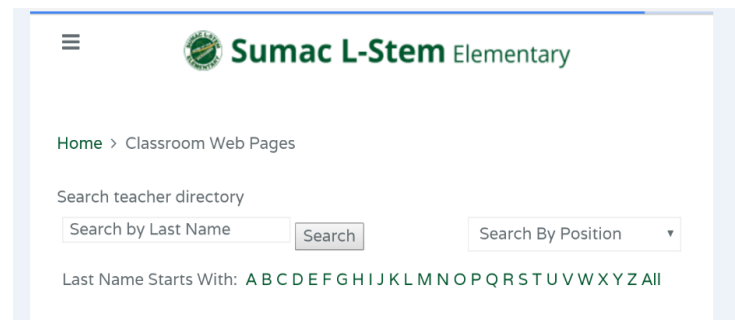


Fig. 1: Sample of classroom webpage [Source: Adopted from Candler, (2010)]

Students and parents search for information posted by the classroom teacher by typing the teacher's name in the search box then clicking search button. The information is mainly on student's academic progress. The classroom webpage could be a suitable student-parent interaction method because the interaction strictly involves the students, teachers and parents and being a public media, members only post constructive pieces of information. The major shortcoming is that the discussion is limited to student's academic progress only and students and parents cannot discuss the financial, and social or private issues in the platform as it will be made public to the teachers or other school administrators.

Collaborative Apps

Collaborative software or groupware is an application software designed to help people involved in a common task to achieve their goals. One of the earliest definitions of collaborative software is intentional group processes plus software to support them. Collaborative software is a broad concept that overlaps considerably with computer-supported cooperative work (CSCW). According to [2] groupware is part of CSCW. The authors claim that CSCW and thereby groupware, addresses how collaborative activities and their coordination can be supported by means of computer systems. Software products such as e-mail, calendaring, text chat, wiki, book marking and whatsapp belong to this category whenever

used for group work whereas the more general term social software, applies to systems used outside the workplace. Such as example, online dating services and social networking sites like Twitter and book. The use of collaborative software in the workspace creates a collaborative working environment (CWE).

According to [15], some schools use the free location-based social media application as a parental collaboration tool. Parents download the application to their phones. A number of teachers use the free online and mobile applications to interact with the busy parents who always want to know their children's progress. Collaborative application took off some of the burden from the school instructor who would, otherwise, have to create one-way communication channels like e-mail or paper-based newsletters. The collaborative software however, limits interaction to teachers and parents only and cannot help much in case the student wants to interact with the parent.

BuzzMob

BuzzMob is a cross-platform communication tool that connects and engages classroom and school communities. It offers educators the simplest, most effective way to send vital updates and semi-personal messages to parents and students. BuzzMob allows teachers and school administrators to create updates and messages in one simple place in which parent and students can choose to receive communication via web, mobile application, e-mail, or short messages. BuzzMob saves teachers time and energy and provides parents and students with a simple, secure, experience that keeps them updated and engaged. This application enables parents and teachers to connect on a private network that requires authorization before a user can see updates. Ease of use is an advantage of the new collaboration method, where student performance is displayed in the phones correctly. BuzzMob allows parents to have updates on school issues and it informs parents on their children performance plus school functions like closing and opening dates [1]. This application may, however, not be suitable for students in secondary schools in Kenya as it will require them to have mobile phones. There is therefore needed to adapt this platforms security and privacy features to a non-mobile platform for boarding schools.

The Teacher App & Grade Book

The Teacher App and Grade Book tool helps enhance collaboration between teachers, parents, students, and schools using parent messaging, an interactive calendar, event notification and course grade notifications. Parents can check grades, review attendance records, submit absentee letters, and stay on top of upcoming events with the app's calendar. The goal of the teacher app and grade book is to increase parental involvement in the classroom. Research has proven that increased parental involvement in matters related to student education, increases students' motivation, test scores and individual school performance. Teacher app and grade book offer individual user interfaces for teachers, parents and students. Each user interface has its own unique features including grade book, school messenger system, student, parent messaging interactive class calendar events, course grades, assignment grades and notes sent assignment attendance records and absentee notices [9]. The application

emphasizes academic; however, it does not offer private platform for the student- parent interaction, and this is a set back as the students are not able to discuss their social and personal issues.

Collaborize Classroom

According to [10], the increasing use of the web in schools is allowing teachers and students go beyond the boundaries of the physical classroom, instead it involves online collaborative learning engagement. Collaborize classroom is one such online collaborative platform that focuses on collaborative elements such as structured online discussions between students, online brain storming, peer feedback and online surveys. It also assists the teacher in monitoring and encouraging students in terms of their participation. At Bella Vista High School in Fair Oaks, California in United States of America, teachers use this education focused app to set up a closed network where a parent can discuss topics, trends, and student progress. The structured online discussion platform lets one extend the classroom discussion outside the normal school hours and engage with parents who want to be kept in informed on how their children are faring on in class. Teachers post links to articles and videos, upload links, set up discussion threads, and field questions in a closed, safe environment that is only accessible to registered members. This application may not be suitable for student in secondary boarding schools in Kenya as it would require them to acquire mobile phones. Secondly, it does not offer private interface platform.

Remind 101.

According to [5] Remind 101 is a private mobile messaging platform that enables teachers, parents, students and administrators in schools to communicate with each other. The platform has more than 20 million monthly active members across the United States of America as of September 2016. Remind 101 is used in more than 50% of the public schools in the USA. The app lets teachers create an account that parents can join by sending a text message. Because they can message their entire classes and or parents quickly from their mobile phones, teachers are able to stay in contact on the fly and collaborate with parents without having to pick up the phone or send out an e-mail. Because it accommodates more than a million active members, the platform may not be safe for the secondary boarding schools' students in Kenya as it may expose them to drug traffickers, arsonists and destructive relationships.

According to [13], most boarding schools in Kenya provide a cell phone for the students to call their parents. Only few of these schools have clear policy on the mobile phone use. There is stipulated time for teacher-parent interaction and the personnel in charge of the mobile phone. Majority of the schools don't have policy on student – parent interaction, in some of them, students beg for phones from anybody found within the school compound. The situation is worsened in some schools, where student-parent communication is restricted until that time that they break for home at the end of the term. This clearly indicates that Kenya lacks a parents-students interaction platform and therefore need to adopt one or more of the platforms available in other countries as discussed above. The next section reviews theory that grounds this study.

B) Theoretical Framework

This research was guided by Gestalt Theory User experience design. Along with Kohler and Koffka, Max Wertheimer was one of the principal proponents of Gestalt theory in 1912 which was later revised by Johan Wagemans in 2012. Gestalt theory User experience (UX) design amplifies the process of enhancing user satisfaction with a product by improving the usability, accessibility and pleasure provided in the interaction with the product. Human brain is an amazing data processor whose broad capacity still has not been explored at full. Knowledge of cognitive abilities and mechanisms is highly helpful in creating a user-friendly product. The researcher borrowed ideas like, when people perceive the complex objects consisting of many elements, they apply conscious or subconscious methods of arranging the parts into a whole organised system instead of just the set of simple objects. One of the principles in this theory is the principle of proximity for UX design.

II. RESEARCH METHODOLOGY

The study adopted a mixed research approach by undertaking survey research design. Purposively sampled 4 secondary boarding schools. Concurrently collecting both quantitative and qualitative data in the same phase of the research process. Interview schedules, In-depth interviews, questionnaires and content analysis were the main tools used to seek information from the head teachers, deputies, students and parents in order to understand some of the interaction challenges faced by students in secondary boarding schools. Findings were quantitatively and qualitatively analysed.

The study used both probability sampling and non-probability sampling techniques by adopting stratified sampling and purposive sampling methods. There were 44 secondary schools in Rachuonyo South sub-county 4 were pure girls boarding schools, 4 were pure boys’ boarding schools and 36 were mixed secondary school.

The schools were grouped according to Strata of Extra County schools and County schools, then according to girls’ schools and boys’ schools. The 4 schools were then randomly sampled from the strata. The study employed, stratified random sampling to group the students into strata according to their form level. There were form one, form two, form three and form four strata. Twenty-one (21) or 20 students were randomly sampled from each form using the form registers provided by the schools, the researcher ended up with total of (330) students.

The head teachers and deputy head teachers were purposely chosen to participate in this study as they had vital information about the student interaction challenges, they face in their school.

III. RESULTS AND DISCUSSIONS

A) Introduction

The study aimed at assessing an automated interface design for student-parent interaction in secondary boarding schools that would enable the development of a suitable interaction platform, between parents and students. The existing and

emerging students-parents interaction platforms used in secondary boarding school was the objective and was investigated using the following constructs: existing student-parent interaction methods in the secondary boarding schools, and the reasons to why they are necessary. The findings are shown and discussed below.

The study involved head teachers, deputy head teachers and students who were respondents, from four selected secondary boarding schools.

B) Current student- parent interaction platforms and methods

From Table I, (95.5%) in public secondary boarding schools use mobile phone interface to interact with their parents. Other interfaces used are electronic mail (1.8%) and letters at 12.7%. Mobile phone is still the most popular student-parent interaction method among the students in secondary boarding school despite the ban by the ministry of education. Pointing out that the boarding secondary schools prefer an interface which is timely reliable and efficient like mobile phones.

Table I: Student – parent interaction platforms

Interaction methods	Number of users	Percentage (%)
Mobile phones	315	95.5
Letters	9	2.7
Electronic mail	6	1.8

Source: Researcher (2018)

On the existing student-parent interaction methods in the secondary boarding schools, and the reasons to why they are necessary. One of the head teachers said this:

The students here mainly use mobile phone to interact with their parents. The school provide one mobile phone which is usually with the matron. Students are allowed to use it at speculated times to be able to interact with their parents.

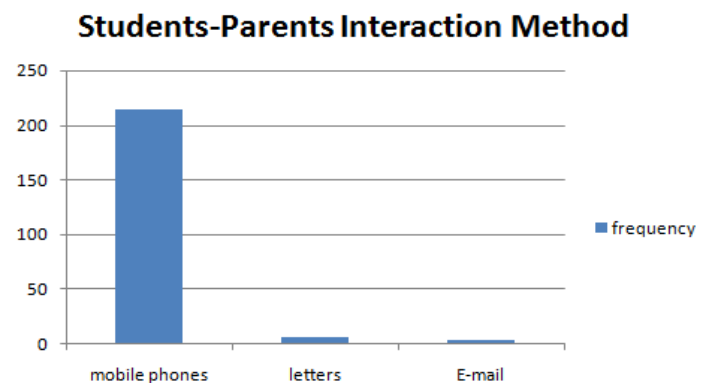


Fig. 2: Frequency of existing interfaces [Source: Researcher (2018)]

The trend in Fig. 2 shows that mobile phone is still the most popular interaction method among the secondary boarding schools’ students and the parents, followed by letters then electronic mail.

C) Source of Access to Mobile Phone Interfaces

Table II: Source of Access to mobile phone

How students access mobile phones:	Frequency	Percentage (%)
From teachers	325	98.6
From support staff	3	0.93
From fellow students	2	0.47

Source: Researcher (2018)

Table II shows that most of the students (98.6%) got mobile phones from their teachers, 0.93% from the support staff and 0.47% of the student’s got mobile phones from their fellow students.

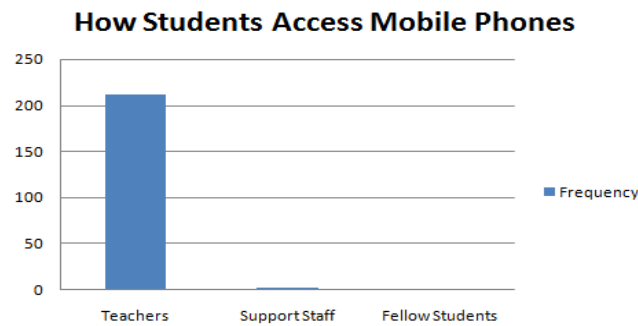


Fig. 3: Frequency on how the students access mobile phones [Source: Researcher (2018)]

The trend in Fig. 3 indicates that most students get mobile phones from their teachers and the education policy implementers. A clear indication that mobile phone usage in school is a suitable alternative interaction method.

D) Frequency of Students -Parents interaction through mobile phones platforms

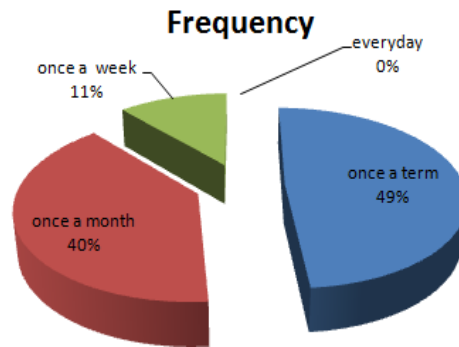


Fig. 4: Frequency of Students -Parents interaction through mobile phones platforms [Source: Researcher (2018)]

Majority of the students (49%) in secondary boarding schools interact with their parents once in a term, 40% of the students do interact with their parents once a month and 11% do it once a week and negligible numbers of students communicate with their parents every day. A clear indication that there is need for parent-students interaction in boarding schools.

E) Stipulated School Time periods for mobile phone-based Student-Parent Interaction

Time for Student Parent Interaction

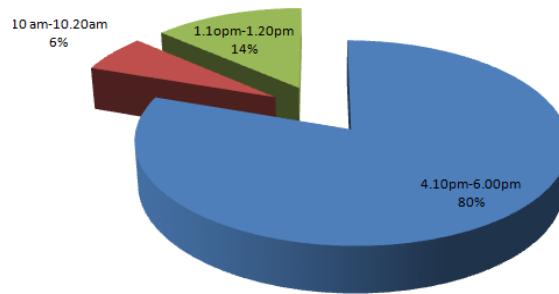


Fig. 4: School Time periods for interaction [Source: Researcher (2018)]

Interaction with the parents at 4.10 pm-6.00 pm had the highest rank (80%), followed by student parent interaction (14%) at 1.00pm-1.20pm while 6% of the students interact with their parents at 10am-10.20 am.F) Student -Stranger mobile phone-based Interaction while in boarding school

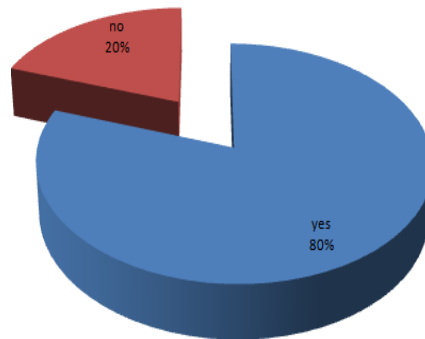


Fig. 5: Frequency of Student -Stranger mobile phone-based Interaction while in boarding school [Source: Researcher (2018)]

The study findings showed that majority (80%) of the secondary boarding school students have at one point or the other interacted with a stranger, while 20% have never interacted with strangers on the cell phone while in school. Thus, necessitating need to have an interface that filters information and facilitate interaction between student and a parent.

G) Problems Faced by Students that prompt them to mobile phone-based interaction

Table III: Students' Financial Problems

Problems Financial	Respondents	Frequency	Percentage (%)
School fees	Students	325	98.6
	Teachers	8	100
Pocket money	Students	299	90.6
	Teachers	5	62.5
Bus fare	Students	292	88.4
	Teachers	6	75.0
Uniform money	Students	158	47.8
	Teachers	3	37.5
Tour money	Students	296	89.7
	Teachers	4	50

Source: Researcher (2018)

Both students (98.6%) and teachers (100%) mentioned fees problem had the highest rank (100%), while according to students (98.6%) mentioned school fee as serious issue that needed parents' attention. One of the head teachers said,

It pains me to send the students home for school fees when classes are on, this always affect their performance as they miss a lot and they also get exposed to adultery. I wish that the fees payment be a hundred percent so that no student suffers because of lack of school.

Table IV: Students' Academic problems

Problems	Respondents	Frequency	Percentage (%)
Academic	Students	296	89.7
	Teachers	8	100
Revision Books	Students	267	80.8
	Teachers	8	100
Exercise books	Students	75	22.8
	Teachers	4	50
Exams	Students	246	74.1
	Teachers	8	100
Career Choice	Students	143	43.3
	Teachers	4	50

Source: Researcher (2018)

On student's academic problems, 89.7% students and 100% teachers of students highlighted lack of course books. In further inquiry, a teacher mentioned;

'The government provide the students with text-books but sometimes they lose them, and this may negatively affect their academic performance and so their parents must be contacted to replace the missing books'.

Other reasons for calling parents included, Revision Books, 80.8% of the students and (100%) teachers. Exercise books for doing extra work (50%), 22.8% of students called their parents, 74.1% of students called their parents to inform them about their performance and for a piece of advice. Teachers (100%) also contact parent when a student fails exam. Teachers (50%) and Students (43.3%) may also contact parents for Career Choice.

Table V: Students' Social problem

Problems	Respondents	frequency	percentage (%)
Social Problems	Students	63	19.2%
	Teachers	1	10
Health	students	159	48.2
	Teachers	5	62.5
Bullying	students	21	6.25
	Teachers	0	0
Stress	Students	158	47.8
	Teachers	6	45.0

Source: Researcher (2018)

On social problems faced by students in boarding schools. Few students (19.2%) mentioned food as a setback, (10%) complained about special meal required by some students which the school could not afford, 48.2% also contacts their parents over health issue. This is also done by 62.5 % of teachers. One of the head teachers accounts that

When a child is on medication but does not show any signs of improvement, we call the parent for them to offer assistance. Few students (6.25%) mentioned that they still experience bullying and needed to contact their parents about it, (47.8%) contacted their parents when they were feeling stressed. According to (45%) of teacher's participants, student who showed signs of being stressed were counselled.

Table VI: Comparison of Students' Problems handled by parents in secondary boarding schools

Problems	Frequency	Percentage (%)
Academic	328	71.1
Social	289	33.2
Financial	300	74.1

Source: Researcher (2018)

On student's problems handled by parents in school, (71.1%) academic, (33.2%) Social problems and (74.1%) financial problems. The findings showed that to an extent, the parents have been involved in their children's issues while in school, only that there is no clear policy tabulated and suitable platform to facilitate student-parent interaction.

IV. CONCLUSION AND RECOMMENDATIONS

From the above findings on the existing and emerging students-parents interaction platforms used in secondary boarding school, electronic mails and letters were the existing ways of interactions while mobile phones were the emerging student's- parents interaction platforms. Mobile phone is still the most popular interaction platform among the secondary boarding schools students and the parents (95.5%), followed by letters then electronic mail and most of the students (98.6%) got mobile phones from their teachers, 0.93% from the support staff and 0.47% of the student's got mobile phones from their fellow students. Almost half of the students (49%) interact termly with their parents is a clear indication that there is need for parent-students interaction interface while they are in boarding schools.

Parents and students (80%) concurred that the best time to allow access to the student parent interaction in schools is 4.10 pm-6.00 pm. that majority of the students (80%) had interacted with strangers. On the frequency of Problems that prompt Students to mobile phone based interaction , (98.6%) students mentioned school fee, course books 89.7% ,Revision Books, 80.8% , 74.1% of students called their parents to inform them about their performance, Exercise books for doing extra work (50%), 48.2% also health issue , stress (47.8%), Career choice Students (43.3%), exam performance 22.8%, .food (19.2%) , (10%) complained about special meals, Few students (6.2 5%)

mentioned bullying .On average most students interact because of financial problems (74.1%) followed closely by academic (71.1%) and lastly (33.2%) social problem.

This study recommends the need for design of an interface in which each student had an account and logged in using log in credentials and priority in the interface design be given to financial problems and academic issues. The ministry of education and the school head teachers need to allocate funds for provision of a special room for computer to be installed with interaction interface to enable each student get an opportunity to interact with their parent between 4 pm to 6 pm, secondly, teacher on duty be charged with additional responsibility of guarding and supervising student-parent interaction process.

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