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Proceedings of the 4th International Conference on Infrastructure
Development in Africa (ICIDA) (ISSN 2026-6650)

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Citation Details

Citation for the version of the work held in 'OpenAIR@RGU':

ADINYIRA, E., KWOFIE, T. E. and AHIAGA-DAGBUI, D. D., 2015. Challenges associated with communication medium among project teams on mass housing project delivery in Ghana. Available from *OpenAIR@RGU*. [online]. Available from: <http://openair.rgu.ac.uk>

Citation for the publisher's version:

ADINYIRA, E., KWOFIE, T. E. and AHIAGA-DAGBUI, D. D., 2015. Challenges associated with communication medium among project teams on mass housing project delivery in Ghana. In: BADU et al., eds. Proceedings of the 4th International Conference on Infrastructure Development in Africa (ICIDA). 25-26 March 2015. Ghana: Kwame Nkrumah University of Science & Technology. Pp. 394-411.

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Challenges Associated with Communication Medium among Project Teams on Mass Housing Project delivery in Ghana

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Citation:

Adinyira, E, Kwofie, T E and Ahiaga-Dagbui, D D (2015) Challenges Associated with Communication Medium among Project Teams on Mass Housing Project delivery in Ghana. *In: Badu, E, Ayarkwa, J, Ahadzie, D, Adinyira, E, Owusu- Manu, D and Kwofie, T (Eds.), 4th International Conference on Infrastructure Development in Africa (ICIDA), March 25 – 26, 2015, Kumasi, Ghana. ICIDA, 394-411.*

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ABSTRACT

The construction of mass housing has become a very important policy in the government of Ghana's efforts at reducing the country's housing deficit. Unlike traditional one-off building projects, Mass Housing Projects (MHPs) typically present a plethora of asynchronous and synchronous communication among project team members. The efficiency and effectiveness of these communications can be very critical to the successful delivery of the project within cost and time limits. The uniqueness and overall importance of MHPs also presents project managers with communication management challenges which are a clear departure from those associated with traditional one-off construction projects. In this paper, project team communication challenges associated with MHPs in Ghana are critically explored. This would form the basis for recommending practical measures and avenues to improve quality of project team communication on MHPs. By adopting a survey approach, data was collected via structured questionnaire administered to sixty-three MHP team members across the country and analysed using mean score index. Both synchronous and asynchronous forms of communications were found to be employed by project team members with face-to-face meetings and discussions, telephone calls, e-mails and text messaging being the most frequently used media. Aside the common communication challenges such as timeliness of required information, distortion and overload, this paper also identified difficulties relating to access to information as well as challenges regarding dissemination procedures and protocols as key challenges faced by MHP team members.

Keywords: Communication, Project team, Mass housing Projects, Project management, Ghana

INTRODUCTION

A number of reasons have been suggested in the literature for the failure of the construction industry to deliver projects within time schedule and budget. These range from managerial incompetence to technical difficulties on the project as well as risks

and uncertainties (Ahiaga-Dagbui and Smith, 2014). Furthermore, how an assembled project delivery team of contractors, designers, suppliers, project managers, etc. collaborate effectively on a temporary project will largely depend on how they communicate with each other. The reader must bear in mind that the members of these so called 'project teams' may not be used to working with each other and are all usually profit-driven in a highly competitive and low-margin industry. Juxtapose that backdrop with the adversarial conditions engendered by most construction contracts and it may be easy to reckon that effective communication and timely flow of information may not be the natural tendency within most construction 'teams'.

Hoezen *et al.* (2008) indicate that the efficiency and effectiveness of the construction process strongly depends on the quality of communication between the different team players. Thus, effective flow of information within project team has been one of the most frequently studied project team success factors (Pinto, 2002, Scott-Young and Sampson, 2008, Amando *et al.*, 2012). Effective communication is even more crucial for the successful delivery of projects like the mass housing schemes because of their size, large number of project team members and their spread across different geographic regions. . However, communication ineffectiveness has been found to contribute to the failure of projects being completed in time or on budget (Hoezen *et al.*, 2008; Dyer, 2008) hence requiring attention to remedy these developments in the construction industry. Xie *et al.* (2010) therefore suggested that effective communication among the project team demands rigorous studies to identify the most effective communication medium are used which take into consideration the peculiarity and complexity of the project as well as the skills and expertise of the parties involved in delivering that project. Otter and Emmitt (2008) for example assert that projects teams tend to adopt several communication medium, often leading to misunderstandings and information distortion during the project delivery.

Communication medium and communication technologies play a significant role in ensuring effectiveness of the communication outcome and thus the effectiveness of the medium that best suit the communication context must not be overlooked. Construction project teams usually adopt varying communication medium and thus the effectiveness of the medium in any communication context is very critical especially on projects of unique particularities. Project management practice, and knowledge is continuously shifting from traditional 'one-fit-all' to embrace skills that account for the characteristics of projects, project typologies and project context (Crawford *et al.*, 2004). Additionally, Salleh (2008) suggested that the effectiveness of communication is context induced and that ensuring high communication outcome levels must be pursued from the contextual perspective. Against this backdrop, it makes, adopting existing studies across all project typologies impracticable. Also, whereas studies are rife (see Emmitt and Gorse, 2007; Xie *et al.*, 2010; Liu, 2009; Thomas *et al.*, 1998) on traditional one-off construction projects, ones on projects of unique particularities such as mass housing projects is yet to be extensively pursued. Consequently, Ahadzie *et al.* (2007) and Kwofie *et al.* (2014) affirmed that mass housing projects are unique and thus require unique approach in their management and delivery. The role of communication at all

stages of the construction process has become such a multifarious and complex term (Dainty *et al.*, 2006), so that it is imperative to understand the needs of the individuals involved and how they communicate within project teams if communication is to be effective (Emmitt and Gorse, 2007). . However, due to the use of various communication tools, team communication might become ineffective without clear guidance from management and involvement and commitment from all team members (Otter and Emmitt, 2007).

Enshassi and Burgess (1997) revealed that managerial inefficiencies and communication ineffectiveness are prevalent on mass housing projects and thus the most suitable communication approach is critical to remedy the development. Undoubtedly, there are gaps in the available literature in general on the forms of communication and media, their associated challenges and suitability in use among mass housing project teams. As the development and adoption of a context specific medium of communication has been identified as one of the critical success factors of a of construction teams (Love *et al.*, 2001), this paper aims to assess the effectiveness of communication tools, media and forms used by project teams on Mass Housing Projects (MHPs).

OVERVIEW OF MASS HOUSING PROJECT TEAMS

The Ghana National Housing Policy (2012) defined mass housing as *“the process of simultaneous production (building) to target prices of large number of decent, safe, sanitary and affordable residential buildings with secured tenure; on a continuous and permanent basis with adequate physical infrastructure, amenities and social services in a planned, healthy and liveable environment to meet the basic and special needs of the population and reflecting their socio-economic status, cultural aspirations and preferences”*. The design and construction of the housing units involves a cluster of participants that form the project team. The project team may be composed of individuals or organizations that are outside the real estate organization in charge of the housing development for sale.

Mass housing projects are said to possess unique physical, organisational and operational features and thus require unique managerial and communication approach among the project team (Ahadzie *et al.*, 2007; Kwofie *et al.*, 2014). Kwofie *et al.* (2014) affirmed that mass housing projects exhibit multiple construction sites for the housing units, multiple geographical locations, repetitive design units in its contract packaging and complex procurement and relationship among the project team, These features notwithstanding, offer managerial and communication effectiveness challenges (Ahadzie *et al.*, 2014; Kowofie *et al.*, 2014). Typically on mass housing project, project teams would compose of architects, quantity surveyors, real estate organization, engineers, builders with varying authorities and forming complex communication relationships. A typical structure of a mass housing project team reveals that the roles and responsibilities of the professionals in delivery mass or public housing are numerous and the success is heavily dependent on the quality of the communication medium that can instigate effective communication among the team (Anyanwu, 2013).

In Ghana plethora of mass housing projects undertaken by government and private sector GREDA organisations are beset with numerous communication challenges which are inherent from the unique nature and mass housing projects and its project environments. This necessitate that mass housing project team must adopt skills, channels and strategies that can enhance the communication outcome to engender mutual understanding of the project related information shared. According to Dainty et al. (2006) and Emmitt and Otter (2008), project teams have an array of channels and mediums that must be carefully be chosen to adapt to the context of their communication needs.

Communication among MHP Teams

Communication is the basic medium by which any individual can express his or her thoughts and understanding relating to any subject. Communication is also the basic dialogue tool available in establishing relationships and transmitting essential information for the successful and peaceful co-existence of a group of people. It is through communication that collaboration and cooperation occurs (Perumal and Bakar, 2011). It is therefore essential that members within a project team exhibit good communication skills to effectively present their issues, listen and act on feedback, and foster harmony among themselves. Dainty et al. (2006) defined communication as the process whereby information is encoded and imparted by a sender to a receiver via a channel/medium and the receiver then decodes the message and gives the sender a feedback. Ocheing and Price (2009) emphasized that communication is a social process of interaction between individuals. This is certainly the case among mass housing project teams where different construction professionals communicate throughout the construction process, from inception to completion. Richmond and McCroskey (2005) stated that formal and informal networks are the two primary communication networks that exist among project teams and thus the understanding these networks among team members is critical (Dainty et al., 2006). Using biological references, the formal networks can be likened to the 'skeleton' of a company while the informal networks can be referred are the 'central nervous system' which collectively, produces a 'sufficiently flexible and robust communications' (Dainty et al., 2006). Richmond and McCroskey (2005) define formal communication as 'the communication that follows the hierarchical structure' of a team, or 'chain of command'. This tends to specify who a team member has to talk to in any given situation. It describes the pattern of relationship among the team members (Lunenborg, 2010). Dainty *et al* (2006) further clarify these formal networks as those defined by the organisational structure, comprising protocols as well as recognised relationships between people, teams and functional departments.

Informal communication, according to Kraut *et al* (1990) is a loosely defined concept, often treated as the residual category in organisational theory. Richmond and McCroskey (2005) adds that informal communication does not follow the hierarchical path or chain of command. It does not specify who has to be spoken to with regards to specific issues arising within a team. Work by Dulaimi and Dalziel (1994), found that communication was in general, more informal, frequent and satisfactory in design and build projects. This emphasizes the fact that there is 'high cooperation among project teams that tend to use more informal communication networks (Pinto and Pinto, 1991; Dainty *et al*, 2006). Seth and Sethi (2009) opined that these forms of communication among the project team could take the form of intra-personal, interpersonal and inter organizational by adopting both verbal and non-verbal and as such the medium is critical to its success.

Communication among project team members can also occur in various directions. Perumal and Bakar (2011) identify four directional flow of communication that occurs among team members working on a construction project. These are upwards, downwards, horizontal and laterally as illustrated by Smit and Cronje (2002) in Figure 1.0

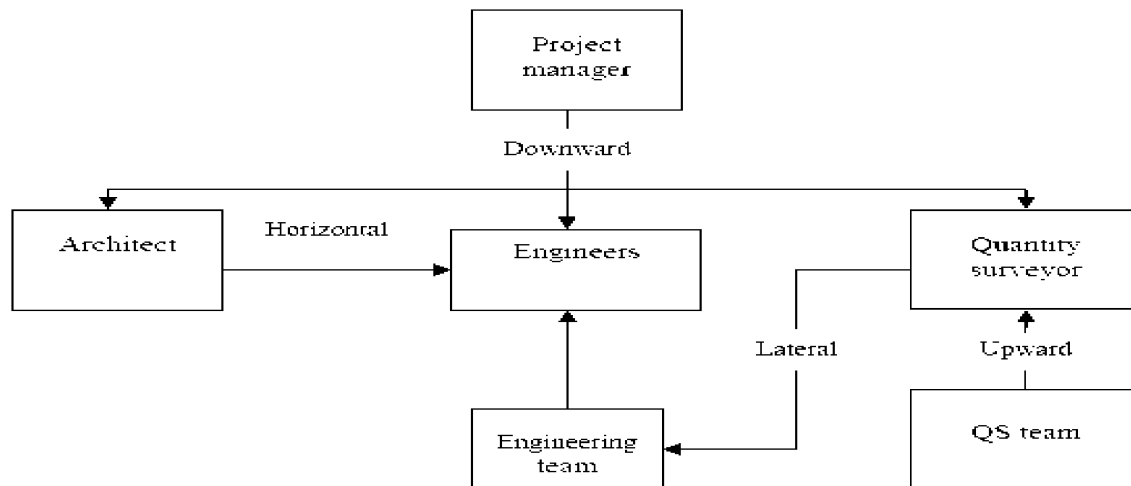


Figure 1: Communication Flow: Source (Adopted from Smit and Cronje, 2002)

However, other theorist such as Lunenburg & Ornstein (2008) as cited in Lunenburg (2010) outlines three directions which establishes communication framework among project team members. These communication directions are depicted in Figure 2.0 below.

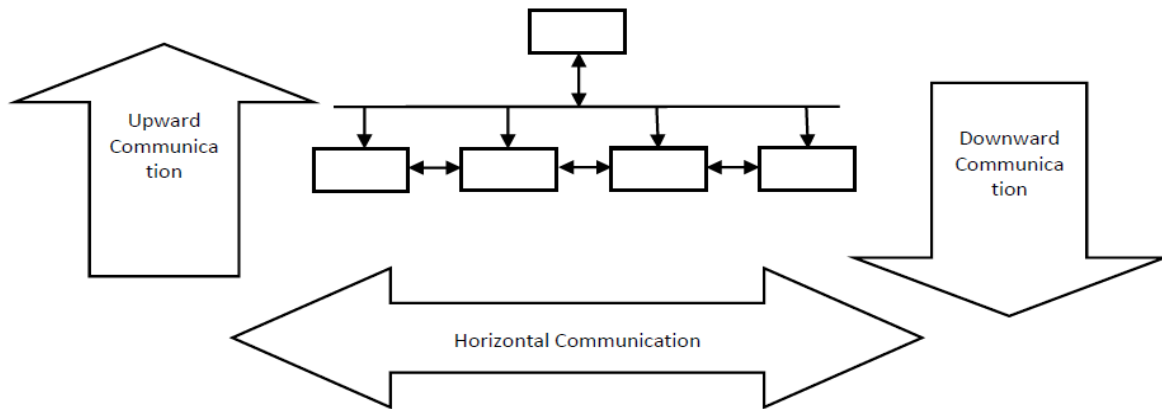


Figure 2.0: Communication Flow: Source (Lunenburg & Ornstein, 2008)

Upward communication, according to Smit and Cronje (2002), is a communication process whereby information is provided to upper or senior members within a team. It is initiated by team members on the lower hierarchy but can only be effective if it is allowed by the senior members within the project team (Richmond and McCroskey, 2005). Communication that directs the flow of information from senior members in a team to lower hierarchical members within the same team is known as downward communication (Perumal and Bakar, 2011). It is usually directive in nature. Horizontal communication however occurs among team members on the same hierarchical level within a project team and it exists to enhance coordination (Lunenburg, 2010). According to Perumal and Baker (2011), it encourages the sharing of expertise among team members.

According to Davenport (1997), team members communicate individually and collectively, adopting appropriate medium that could be termed Synchronous and Asynchronous Communication. Amando et al. (2012) define synchronous communication as a situation where all the parties to the communication are taking part in the exchange at the same time. Synchronous communication, according to Otter and Emmitt (2007), is suitably used by team members in the early phases of a project where discussions are needed for decision-making prior to explicit documentations, sketches and drawing designs. Synchronous communication medium consist of *Live meeting or face-to-face, Conference call, Audio conference, Computer-assisted conference, Video conference, IM (instant messaging) and Texting* (Amando et al., 2012). Asynchronous communication however takes place when all persons involved are not present and feedback is not immediate (Amando et al., 2012). According to Otter and Emmitt (2007), asynchronous team communication might be appropriate for effectiveness and design progress when overview, assimilation of design information and exchange, sharing and conveyance of

information is required and for avoiding miscommunication by double or outdated information and design failures. The asynchronous communication medium are *Mail and Package Delivery, Fax, E-Mail and Project Blog / Project Website* (Amando et al., 2012).

Dainty et al (2006), as well as Torrington and Hall (1998) opine that the major barriers to effective communication among project teams on construction projects include *the individual's frame of reference, stereotyping, cognitive dissonance, Halo or horns' effect, semantics/jargon, not paying attention, delay in dissemination of information, Chinese whispers, environmental problems, a lack of clear objectives and Faulty transmission*. Hence the Dainty et al. (2006) suggest that the choice of the most suitable communication medium must be based on critical assessment of these challenges in order to ensure effective communication among the team as most communication failures are due to ineffective medium. The halo effect is a type of cognitive bias in which our overall impression of a person influences one's thinking on his or her character in a communication process (Dainty et al., 2006). In investigating the communication problems among the project teams associated with the medium used, the study adopted fourteen (14) established communication problems extensively used in the construction industry developed by the CII (1997). These factors have been extensively used in project team communication challenges in the construction industry across several project typologies (see Thomas et al., 1998; Xie, 2002; Liu, 2009; Xie et al., 2010). Additionally, ten (10) communication media from existing literature used in construction communication were also adopted. This formed the basis of the empirical questionnaire survey to elicit the data required for the study. These variables are presented in Tables 1.0. The adoption of these established factors and media was to ensure theoretical validity and triangulation.

TABLE 1.0: ADOPTED VARIABLES FOR THE STUDY

Communication Media associated Challenges													
1	Excessive information beyond what is needed for task function												
2	Meaning of information altered during dissemination through dense team relationship												
	Receiving distorted communicated information during dissemination among team												
4	Frequently receiving conflicting communicated information among teams												
5	Inappropriate use of communication procedures in information dissemination												
6	Delay or late delivery of needed communicated information												
7	Not being informed of changes and request on time												
8	Communicated information was not properly coordinated												
9	Experiencing difficulty in accessing communicated information due to location or technology												
10	Intentionally withholding part of information during dissemination among team by gatekeeper												
11	Organizational inefficiencies and difficulties in handling and disseminating information												
13	High level of misunderstanding of communicated information received												
14	Communicated information was less than what was needed for the task												
	Not able to receive communicated information												
	<table border="1"> <thead> <tr> <th>Project Team Communication Media</th> <th colspan="5">Authors</th> </tr> </thead> <tbody> <tr> <td></td> <td>Mead, (1999)</td> <td>Xie, (2002)</td> <td>Thomas et al, (1998)</td> <td>Emmitt & Otter, (2007)</td> <td>Dyer, (2008)</td> </tr> </tbody> </table>	Project Team Communication Media	Authors						Mead, (1999)	Xie, (2002)	Thomas et al, (1998)	Emmitt & Otter, (2007)	Dyer, (2008)
Project Team Communication Media	Authors												
	Mead, (1999)	Xie, (2002)	Thomas et al, (1998)	Emmitt & Otter, (2007)	Dyer, (2008)								

1	face-to-face meetings and discussions	√	√	√	√	√
2	telephone calls	√			√	√
3	E-mail	√	√	√		√
4	text messaging	√	√	√	√	√
5	Fax	√			√	√
6	project intranet	√	√	√		√
7	Post	√	√		√	√
8	Web chatting	√	√		√	√
9	voice messages	√		√		√
10	Tele and video conferencing	√	√	√	√	√

Source: Authors' collection from literature

METHODOLOGY

Empirical data was collected through survey questionnaires designed based on the fourteen (14) established communication challenges among construction project teams and ten (10) communication medium adopted from existing literature. The structured questionnaires were administered on project team participants that were involved in the execution of mass housing projects in Ghana. The questionnaire first asked the respondents of their roles, experience and number of housing units handled by the team as their background information. Respondents serving as project team participants on mass housing were drawn from real estate organisations and firms registered under Ghana Real Estate Developers Association (GREDA) - an umbrella body regulating real estate activities in Ghana. The mass housing project teams were also asked to draw from their experience in mass housing development and indicate the frequency of the communication challenges identified are associated with the communication medium adopted by the project team on their mass housing projects. Respondents were to assess the frequency of communication problems associated with the communication medium on a five (5)-point Likert scale ranging from not very frequent to very frequent. The 32 responses were received from the total 63 questionnaires (51% response rate). The responses were then analysed to determine the background of respondents, the respondent's frequency of use of identified communication media and their effectiveness as well as the critical challenges in the use of the identified communication medium.

RESULTS AND DISCUSSIONS

Background of Respondents

A total of 63 questionnaires were administered and 32 were retrieved at the close of the survey which lasted for a period of four weeks, representing a 51% response rate. The details of the profile of the respondents are summarized in table 2.0.

Table 2.0: CHARACTERISTICS AND ANALYSIS OF THE GENERAL AND BACKGROUND INFORMATION OF RESPONDENTS

<i>PROJECT TEAM PARTICIPANTS</i>		
Project Team Members	Frequency	Percentage (%)
Project Manager	8	25%
Architect	2	6%
Quantity Surveyor	10	32%
Engineers	5	18%
Main Contractors	3	10%
Sub-contractors	2	6%
Otthers	1	3%
Total	32	100.00
<i>PROJECT TEAM EXPERIENCE IN MASS HOUSING</i>		
Number of years	Frequency	Percentage
0-5years	6	18.8%
6-10years	11	34.4%
11-15years	3	9.4%
16years and above	12	37.5%
Total	32	100.0%

Source: Field Data

The results in Table 2.0 suggest a fair representation of all the likely key and dominant professionals that form project team on mass housing projects. Additionally, the results reveal that a large proportion of the project team members have had a minimum experience of over five (5) years in mass housing project delivery. This is an indication that, the project team members have adequate experience on mass housing and are more likely to give credible responses to the questionnaire hence ensuring adequate validity and reliability of the results.

Frequency of Use of Communication Medium

In order to determine the most used communication medium employed by project team members working on Mass Housing Projects, respondents were asked to rank the frequency of use of various communication media. The results in Table 3.0 reveal that 'face-to-face meetings and discussions (site meetings) is the most frequently used communication medium among team members on MHPs with a mean score of 4.88.

'Telephone calls', 'e-mail' and 'text messaging' were ranked 2nd, 3rd and 4th with mean scores of 4.66, 4.41 and 3.41 respectively.

Table 3.0: Frequency of the use of communication medium among project team

Communication medium	Mean	Std.	Ranking
face-to-face meetings and discussions	4.88	0.336	1 st
telephone calls	4.66	0.701	2 nd
E-mail	4.41	0.875	3 rd
text messaging	3.41	1.316	4 th
Fax	2.31	1.176	5 th
project intranet	2.16	1.298	6 th
Post	2.06	1.045	7 th
web chatting	2.03	1.159	8 th
voice messages	1.78	0.975	9 th
tele and video conferencing	1.44	0.914	10 th

Communication media such as text messaging fax, project intranet, post, web chatting, voice messages, tele and video conferencing are not frequently used. This suggests that in spite of the perceived merits of these traditional and emerging media in construction communication (Dainty et al., 2006; Emmitt and Otter, 2007), project teams in Ghana are yet to embrace them in their communication.

Effectiveness of Communication Medium

Assessing the effectiveness associated with each medium adopted is critical in identifying the most suitable for current and future mass housing projects. The results as presented in Table 4.0, comparatively, indicate that 'face-to-face meetings and discussions' (site meetings) are perceived as the most effective means of communication among team members with a mean score of 4.81. The results also shows that 'e-mail' is the second most effective communication medium (mean score of 4.72 compared to 'telephone calls' which also had a mean score of 4.72. The findings further indicate that

'text messaging' has emerged as an effective communication medium with a mean score of 3.53.

Table 4.0: Effectiveness of Communication Medium used among Project Team

Communication medium	Mean	Std. Deviation	Ranking
face-to-face meetings and discussions	4.81	0.738	1 st
E-mail	4.72	0.457	2 nd
telephone calls	4.72	0.523	3 rd
text messaging	3.53	1.191	4 th
project intranet	3.03	1.231	5 th

Studies conducted by Daft and Lengel, (1984) on media richness, concluded that face-to-face meeting and dialogues are the highest communication media while communication through electronic means are lower in richness. This confirms the results in table 4.4 above. However, communication media such as Fax, project intranet, Post, web chatting, voice messages, tele and video conferencing not appearing here is that they were no responses given to them suggesting that the project participants were not using these media. It is interesting to note that, few years ago, Fax which used to be considered as a traditional fast and efficient medium over posting in the industry has lost its prominence. This could be attributed to the fact that with the emergence of improved mobile phone communication in Ghana, teams have adopted new media that better and effectively enhance communication effectiveness over the traditional media.

Challenges Associated with the frequently used Communication Medium

The results presented in Table 4.0 indicate that there are four frequently used communication media employed by project team members on mass housing projects in Ghana. These were 'face-to-face meetings and discussions', 'telephone calls', 'e-mails' and 'text messaging'. Therefore, these four (4) communication media were analysed to ascertain the likely challenges that team members encounter in their use.

Face-To-Face Meetings

Table 4.4 below gives respondents appreciation of the challenges they encounter when using 'face-to-face meetings and discussions' (the most frequently used) means of communication within a project team. The information in the table indicated that respondents have a major challenge with 'excessive information beyond what is needed for task function' which had a mean score of 3.43. Even though the other challenges had mean scores less than the Test value of 3.50, respondents acknowledged their occurrence among team members. The respondents acknowledged that 'meaning of information altered during dissemination through dense team relationship' was the

next challenge with a mean score of 2.66 and the least challenge encountered is 'not able to receive communicated information', having the least mean score of 1.43.

Telephone Calls

The second most frequently used communication medium among mass housing project team members was the telephone. From the results in Table 5.0, *Excessive information beyond what is needed for task function, Meaning of information altered during dissemination through dense team relationship and Receiving distorted communicated information during dissemination among team* were the significant challenges associated with the use of telephone as the communication medium among mass housing project team. Even though the other challenges had mean scores less than the Test value of 3.50, respondents acknowledged their occurrence among team members. The respondents equally acknowledged that '*Experiencing difficulty in accessing communicated information due to location or technology*' was the 4th challenge with a mean score of 2.97 and the least challenge encountered is '*not able to receive communicated information*'.

Table 5.0: Challenges Associated with Frequent Communication Media on MHPs

COMMUNICATION CHALLENGES	Communication Media							
	Face-to-face		Telephone		E-mail		Text- message	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Excessive information beyond what is needed for task function	3.43	1.425	3.17	1.227	2.25	1.206	2.06	0.827
Meaning of information altered during dissemination through dense team relationship	2.66	1.143	3.00	1.114	1.93	0.884	2.5	0.985
Receiving distorted communicated information during dissemination among team	2.45	1.055	3.03	1.14	1.72	0.649	2.21	0.918
Frequently receiving conflicting communicated information among teams	2.20	1.186	2.78	1.237	1.9	0.960	2.11	1.132
Inappropriate use of communication procedures in information dissemination	2.07	1.132	2.07	0.858	1.82	0.772	2.5	1.155
Delay or late delivery of needed communicated information	2.03	1.117	1.72	0.922	2.38	1.115	2.65	1.089
Not being informed of changes and request on time	2.00	0.832	2.00	0.734	2.71	0.976	2.82	0.883
Communicated information was not properly coordinated	2.00	0.926	1.93	0.868	1.83	0.711	2.53	0.800
Experiencing difficulty in accessing communicated information due to location or technology	1.96	0.922	2.97	0.999	3.55	1.338	3.15	1.137
Intentionally withholding part of information during dissemination among team by gatekeeper	1.96	1.071	2.37	1.066	2.11	0.994	2.76	1.200
Organizational inefficiencies and difficulties in handling and disseminating information	1.85	0.989	2.00	1.00	1.86	0.953	2.27	1.280
High level of misunderstanding of communicated information received	1.79	1.114	2.24	0.872	2.28	0.960	2.95	0.848
Communicated information was less than what was needed for the task	1.68	0.819	1.85	0.602	2.69	0.967	3.14	1.153
Not able to receive communicated information	1.43	0.634	1.67	0.959	2.52	1.208	3.35	3.35

E-Mails

The third most frequently used means of communication among project team according to this study was 'e-mail'. The findings presented in Table 5.0 indicated that '*Experiencing difficulty in accessing communicated information due to location or technology*' as the critical challenge associated with the use of e-mail as a communication medium among the mass housing project team. Consequently, even though the other challenges had mean scores less than the Test value of 3.00, it can be acknowledged that they are likely to be significant on MHPs among team members and must equally be taken serious.

Text Messaging

The fourth most frequently used means of communication among project team according to this study is 'text messaging'. The results revealed that the major challenge in the use of text messaging as a medium as '*Not able to receive communicated information*'. This challenge had a mean score of 3.35. They also acknowledged that '*Experiencing difficulty in accessing communicated information due to location or technology*' and '*Communicated information was less than what was needed for the task*' having mean score of 3.15 and 3.14 respectively posed significant challenges. Even though the other challenges had mean scores less than the Test value of 3.5, respondents acknowledged their occurrence among team members. They ranked '*High level of misunderstanding of communicated information received*' as the next challenge with 'text messaging' (a mean score of 2.95) and the least challenge encountered is '*Excessive information beyond what is needed for task function*', having the least mean score of 2.06.

The results presented clearly suggest that communication challenges are indeed experienced in the use of various communication media adopted by mass housing project teams. These findings reveal four main communication media used by mass housing project teams. The results indeed affirm aspects in existing literature as well as giving new emerging direction in the Ghanaian industry. According to Liu (2009), video conferencing, e-mail and project intranet are the predominant medium adopted on various project typologies in Hong Kong. This was not the case in terms of communication within MHP teams in Ghana as communication was predominantly face to face discussions, usually at site meetings or the use of emails and phone calls. This may likely be due to the technological challenges associated with the use of IT facilities. The findings in this study also confirm that communication is contextual and that the medium is influence by the context and existing communication infrastructure. In many advanced countries, effective asynchronous media suit virtual project environment whereas in the context of developing countries like Ghana, lack of the necessary IT infrastructure influences the media that fit the context and may likely not effectively enhance communication. The results here therefore have implication for now and future development in the industry if effective communication is to be achieved on mass housing projects and construction projects in general.

CONCLUSION AND IMPLICATION OF FINDINGS

The construction of mass housing projects has become a very important policy in the government's effort to reduce the housing deficit in Ghana. Hence, it is a justifiable endeavour to research and add to knowledge in every aspect of mass housing projects delivery in Ghana. Substantial works already done in this regard has shown that many of the problems arising during housing projects can be traced to ineffective communication medium adopted among the project team members. In this regard, the findings offer empirical evidence for project teams on mass housing project to make critical synthesis of available media that suit their needs. It also offers a training requirement for team participants to sharpen their skills in the use of these media. Invariably, the significance of communication to managerial and organizational effectiveness in construction project delivery and the industry at large points to the need for the introduction of communication in all built environment programmes at the tertiary level. However, in construction, even though there is plethora of literature justifying the significance of appropriate and bespoke communication and strategies in the industry, these are yet to be integrated into the training curricula of built environment professionals especially in many developing countries. Hence, the findings of this paper also suggests the need for a rethink around curriculum redevelopment for programmes offered in built environment courses, especially those related to project and construction management to incorporate issues related to effective project communication.

Communication effectiveness and communication medium adopted among the project team undoubtedly make significant contribution to the overall performance outcome of the team as well as team effectiveness needed towards delivery success. However, there is enough evidence among literature on the need to identify the most suitable medium that project teams must adopt to ensure effective communication in project delivery. Given the paucity of studies in this direction on mass housing projects, this study has empirically delivered the effectiveness of communication media adopted by mass housing project teams in the Ghanaian construction industry. The study has revealed the predominant communication media among team members and their effectiveness and efficiency in conveying the project related information among mass housing project teams in enhancing mutual understanding of project related information. These communication media are effective for use among mass housing team members were; face-to-face meetings and discussions, telephone calls, e-mails and text messaging. Contrastingly, communication media such as project intranet that have been found to be very effective in construction project communication in many developed countries (Liu, 2009; Xie et al., 2010) was found not to be frequently used and consequently perceived as not being effective among the project team. These findings however have various implication for mass housing practitioners and stakeholders.

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