Journal of Construction Project Management and Innovation Vol. 5 (2): 1176-1195, 2015
ISSN 2223-7852

AN EMPIRICAL ASSESSMENT OF INEFFECTIVE COMMUNICATION INHERENT IN THE ATTRIBUTES OF MASS HOUSING PROJECTS

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ABSTRACT

Mass housing projects (MHPs) continue to experience significant communication difficulties among the project teams in their delivery which is largely perceived to be due to the influence of its unique characteristics. However, what is less known is the extent and nature of the communication problems caused by the unique features of MHPs. Through a structured questionnaire survey, empirical data were drawn from mass housing project team leaders of real estate organizations who have been actively involved in the execution of mass housing projects in Ghana. The crux of the survey was to identify the communication ineffectiveness among the project team that are inherent in the unique features of MHPs. Through the use of factors analysis as the analytical approach, three underlying clusters named in order of their significance as component 1: Access to information challenges, component 2: Challenges in flow of information and component 3: Import of information challenges were identified as the main communication ineffectiveness inherent in the unique features of MHPs experienced among the project team. These findings provide the necessary foundation towards planning and formulating communication strategies as well as developing behavioural skills needed to engender communication effectiveness in mass housing delivery. The findings 'misunderstanding' and lack of defined roles' emerging as communication ineffectiveness peculiar to MHPs also reinforce the uniqueness of mass housing projects compared to traditional construction building projects and thus useful for practitioners to gain insight into the project attributes and management intuition on MHPs.

Keywords: ineffective communication, mass housing projects, project team communication

1. INTRODUCTION

Effectiveness of project team communication for the design and management of construction projects are becoming increasingly important due to the growing technical

and organizational complexities of construction projects. Communication effectiveness on mass housing project is deemed to be influenced by its unique nature and characteristics which additionally presents unique managerial challenges (Enshassi, 1997; Zairul and Rahinah, 2011; Ahadzie et al., 2014). According to Ahadzie et al. (2007), mass housing projects are unique and this imposes significant challenges in its management intuition and delivery. However, it has been emphasized that the ultimate step towards communication improvement is by identifying the challenges and problems that confront the teams' communication performance (Thomas et al., 1998; Xie, 2002). Unfortunately, there has not, as yet, been any work that empirically examines and explicitly establishes communication problems among mass housing project team inherent from its unique particularities and features especially in developing countries. Effective communication is continually identified as very crucial towards project success and team effectiveness especially in multi-disciplinary, interdependent, multi-cultural and collaborative task functional project teams on building projects (Liu, 2009; Reeta and Neerja, 2012; Remidez and Jones, 2012). Mass housing project teams exhibit unique composition and participants that require effective communication to effectively perform to engender the needed success on mass housing delivery. Studies have indicated that MHPs exhibit unique attributes which have huge implication for its management compared to traditional 'one-off' construction building projects (Zairul and Rahinah, 2011; Ogunsanmi, 2012; Ahadzie et al., 2014). The communication ineffectiveness inherent in the unique characteristics of mass housing could be said to be exhibited in the communication task performance and the communication information flow process.

In recent times, the adoption of mass housing delivery as a veritable approach coupled with the role of communication towards managerial efficiency make the need for an empirical assessment towards improvement in mass housing delivery the more significant. Unfortunately, despite the acknowledgement of the uniqueness of MHPs, and its perceived contribution to communication problems among the project team, to date, studies fail to empirically specify the exact communication ineffectiveness on mass housing projects (see Enshassi, 1997; Zairul and Rahinah, 2011; Ibem et al., 2011; Ahadzie et al., 2014). Additionally, notable studies on communication ineffectiveness measures have tended to focus on traditional one-off projects which differ significantly from other project of unique attributes. Hence there is significant limitation in the application and generalization of such studies across all project typologies (see Thomas et al., 1998; Murray et al., 2000; Xie et al., 2010). However, emerging studies continue to suggest improvement in communication performance among the team as very critical (Murray et al., 2000; Xie, 2002; Xie et al., 2010). Hence identifying the communication problems among the project team remains a viable step towards devising strategies tailored towards communication improvement.

The primary objective of this study is to identify the communication ineffectiveness among mass housing project teams inherent in the unique features. The findings from this paper is thus considered very important for engendering managerial efficiencies and communication effectiveness towards success on current and future mass housing projects.

2. DEFINITION AND UNIQUE FEATURES OF MASS HOUSING PROJECTS

The term Mass housing projects (MHPs) have been perceived from various perspectives which consequently have contributed to lack of consensus in its definition. The dominant definition of the term is purely focused on the large scale production of housing

development projects as hinted by Mahdi (2004). Unfortunately, several definitions fail to account for certain unique features of mass housing projects such as project environment, contractual arrangement, physical, organizational and operational attributes, design, procurement, construction and management intuition. In the context of this paper, mass housing has been defined as:

The design, construction and management of standardized single or multiple domestic house-units usually in the same or multiple sites and geographical locations executed within the same project scheme and under the same management and contract (Adinyira et al., 2013; Kwofie et al., 2014).

The unique physical features of mass housing projects are depicted by multiple sites for various units, multiple standardized design-units in scheme, and multiple geographical locations for schemes (Blismas et al., 1999; Khalid, 2005; Zairul and Rahinah, 2011; Ahadzie et al., 2014). The organizational unique features are evidenced in its complex network of team relationship, multiple interdependent sub-contracting under scheme and complex network of procurement systems (Oladapo, 2002; Ogunsami, 2012; Adinyira et al., 2013). The operational task functions that characterize the management of MHPs define its unique operational features. These are defined by duration schedules and planning on housing units, organization of preliminary activities and contract packaging and management concept for labour contracting and subcontracting.

Mass Housing project environment involves interdependent, collaborative and multi-disciplinary team participants. This attribute makes project participants who communicate by adapting to the project's characteristics and organizational context are more likely to be successful and promote team effectiveness. To this effect, a clear understanding of the critical communication problems inherent from the mass housing project environment and features will assist project teams to appropriately develop and adopt plans and strategies towards effective communication.

2.1 Conceptual Framework: Attributions to Communication Ineffectiveness on Mass Housing Projects

The theoretical underpinning of communication effectiveness measure is that communication is contextual and lies within behavioural domain and that internal and external factors are the main attributions of communication performance outcome (Weiner, 2006; Salleh, 2008). The internal factors relate to the communicator's ability and effort in the communication tasks whereas the external factors relate to the communication environment, task difficulty and the communication context. By drawing on the attribution theory and the practical mass housing project environment, communication competencies and the unique features of mass housing were perceived as the main attributions of communication effectiveness among mass housing project teams. The unique features of mass housing inherent from it physical, organizational and operational attributes are accounted as the external factors that significantly influence the

communication information flow outcome among the mass housing project teams (Enshassi, 1997; Kwofie et al., 2014a).

Continuously, the significance of attaining communication effectiveness has been highlighted by several studies. Likewise, it is well noted that, the theoretical positions these studies have traditionally adopted measuring communication ineffectiveness as the valid approach to assessing communication performance (see Guevera and Boyer, 1981; CII, 1997; Thomas et al., 1998; Xie, 2002, Liu, 2009). Additionally, the performance indicator approach has remained the dominant method for communication effectiveness measures in the construction industry through a quantitative inquiry (see Guevera and Boyer, 1981; CII, 1997; Thomas et al., 1998; Xie, 2002; Liu, 2009). Additionally, the CII (1997) study has remained the most extensively adopted in several recent studies on communication performance assessment and thus considered to be very effective (see Thomas et al., 1998; Mead, 1999; Murray et al., 2000; Xie et al., 2010; Liu, 2009). Hence, in ensuring triangulation and theoretically validity, this study adopted the same approach from the studies above mainly being founded on a quantitative paradigm, research design and the choice of survey in the collection of the empirical data.

The emergence and acceptance of the Construction Industry Institute (CII) indicator approach is underpinned by the fact that CII's model incorporates communication variables from a humanistic viewpoint and social network for communication analysis which reflect the global construction project environment of social behavioural interactants. These indicators relate to the accuracy, completeness, understanding, gate keeping, timeliness, barriers and procedures of the communication on the construction project (CII, 1997). Against this, the measure of the communication problems in this paper has been perceived as the quality of the communication composition and flow among the project team due to the influence of the unique features of mass housing. Hence, it is theorized that, the communication effectiveness outcome on mass housing projects due to the influence of the unique features of mass housing projects can be conceptualized in Figure 1.0.

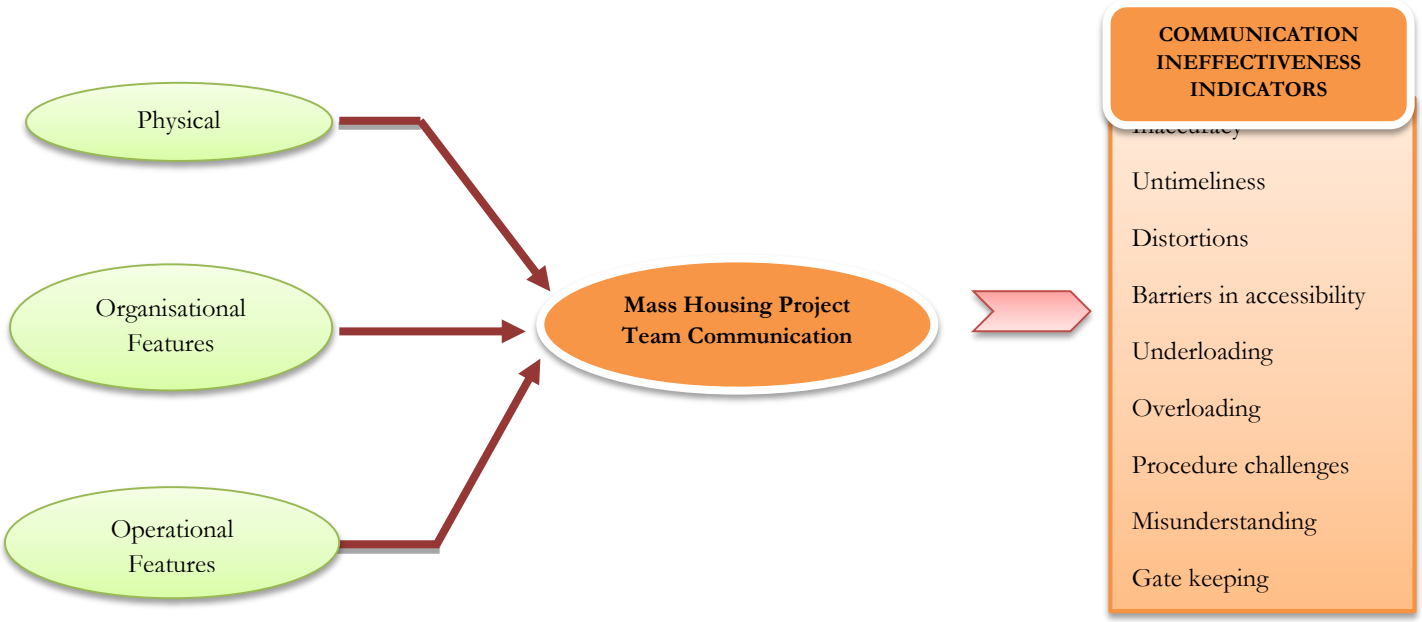

Figure 1.0: Conceptual Model for the influence of Mass Housing Project Features on Team Communication Effectiveness

By drawing on the practical and theoretical perspective of the mass housing project environment and the traditional construction industry in Ghana, the communication effectiveness indicators in the conceptual model were operationalized as indicated in Table 1.0 below.

Table 1.0: Explanation of the Communication Ineffectiveness/Problem Variables

Indicators	**Explanatory Variables**
Inaccuracies	Receiving conflicting information from team participants. Lack of consistency in communicated information leading to lack of coordination among project team. Lack of conciseness in communicated information among the project team.
Untimeliness	Late delivery of needed communicated information
Distortions	Persistent change in meaning of communicated information. Persistent change in content of communicated information. Lack of clarity in communicated information resulting in different interpretations. Lack of coherency in communicated information resulting in different interpretations.
Barriers	Difficulty in accessing communicated information from channels
Underloading	Receiving less information than expected from team participants for tasks
Overloading	Receiving more information than necessary for the tasks
Misunderstanding	Misunderstanding of communicated information
Gate keeping	Withholding of part of the information by the one who controls communication Withholding of whole of the information by the one who controls communication
Procedure	Difficulty in disseminating information among project team Lack of defined roles and responsibilities among members of the team leading to communication failure

Source: CII, (1997); Thomas et al., (1998); Liu, (2009)

3. STUDY METHODOLOGY

The empirical data to meet the main objective of this paper were collected through structured questionnaires administered in a survey. This was conducted on the project team leaders at various mass housing project construction sites of active members of the Ghana Real Estate Development Association (GREDA). Practically in Ghana, GREDA remains the umbrella body of real estate mass housing developers, hence their choice as the sampling frame. The focus on the project team leaders was also motivated by the fact that in mainstream management practice and project management, the overall performance assessment is undertaken by team leaders or managers (Edgar and Lockwood, 2008). Hence, in the survey, the project team leaders at the various project sites were chosen as the unit of analysis to assess the frequency of the various communication ineffectiveness that occurs on their mass housing projects.

The targeted respondents for this study were drawn using purposive sampling technique of active members from the registered list of members of GREDA. The project team leaders managing various projects sites of the sampled active members of GREDA were invited to indicate the frequency of communication ineffectiveness occurring in their project communication based on a five-point Likert rating scale interpreted as: very frequent = 5, frequent = 4, occasionally = 3, rarely = 2 and never = 1).

Out of the total number of 402 registered GREDA members on the standing register, 369 were identified to have complete particulars in address, location and contact numbers and were active in operation. A total of 109 were reached with most of them having more than one project sites. Consequently, a total of 158 questionnaires were retrieved from the total 202 questionnaires distributed to various construction sites of 109 active GREDA members reached representing a response rate of 78%. Similar studies by Ahadzie et al., (2007 & 2014) yielded 37% and 55% response rate respectively. Hence, it can be said that this response rate recorded can be perceived as high and adequate for the statistical analysis. It could be noted that this response rate was borne from the continuous follow up through phone calls, e-mails and personal visits to the respondents. The questionnaire was divided into two sections: A and B. Section A encompasses background information of respondents which included their profession, and years of experience in mass housing delivery. The Section B relates to the main objective of this paper which is to examine the communication ineffectiveness among mass housing project teams. Factor analysis was used to analyze the data collected using statistical package for social sciences (SPSS) version 17. Descriptive statistics were conducted on the background information. The application of the factor analysis was to evaluate which of the variables could be assessing aspects of the same underlying constructs related to communication problems being experienced among the mass housing project team. The potential of factor analysis to identify cluster of related variables as well as reducing large number of variables into a more condensed and easily understood framework justifies its suitability (Motulsky, 2005; Field, 2009). By adopting a Principal Component Analysis (PCA) approach in tandem with similar studies (see Ahadzie et al., 2007; Liu, 2009), the results and discussion of the main ineffective communication among the project team on mass housing projects are presented in the following section.

4. DATA ANALYSIS, FINDINGS AND DISCUSSIONS.

4.1 Analysis of Background Information

The descriptive statistics showing the professions and years of experience of the various respondents acting as leaders of the project team is presented in Table 2.0.

Table 2.0: Background Information on Respondents (Project Team Leaders)

Profession	**Frequency**
Project Manager	26 (*17%*)
Architect	43 (*27%*)
Quantity Surveyor	63 (*39%*)
Civil/Structural Engineer	26 (*17%*)
TOTAL	**158 (100%)**

Years of Experience in industry	**Frequency**
0-5 Years	18 (*11%*)
6-10 Years	82 (*52%*)
11-15 Years	32 (*20%*)

16 Years and Above	26 (*17%*)
TOTAL	**158 (100%)**

Field Data

There were a total of 158 project team leaders at various mass housing construction sites who responded to the survey. The respondents' professional background as mass housing project team leaders were: Project manager (17%), Architect (27%), Quantity Surveyor (39%) and Civil/Structural Engineer (17%). This suggests that, Quantity surveyors are the dominant professionals acting as project team leaders on mass housing projects in Ghana. From Table 2.0, it is obvious to state that over 85% of the respondents have had over 5years of experience on mass housing project delivery in the Ghanaian housing industry. From the above statistics on the respondents' demographic information as project team leaders on mass housing, there is enough evidence that the experience and expertise of the respondents can be considered as highly adequate, respectable and are more likely to give accurate response on the subject under study. The responses offered can thus be regarded as important and reliable, and thus results drawn from their responses is more likely to reflect a sound and credible representation of the communication ineffectiveness among mass housing project teams in the mass housing delivery in Ghana.

4.2 Factor Analysis- Communication Performance Ineffectiveness (Problems) among the Project Team on MHPs.

The factor analysis test proceeded a Kaizer–Meyer–Olkin (KMO) and Bartlett test of sphericity to determine the sampling adequacy and the identity of the population matrix. These are conventional requirements for determining the trustworthiness and reliability of factor analysis results (Field, 2009).

Table 3.0: KMO and Bartlett's Test[a]

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.672
Bartlett's Test of Sphericity	Approx. Chi-Square	412.828
	df	120
	Sig.	.000

a. Based on correlations b. Cronbach's Alpha = 0.786

From Table 3.0, the KMO test yielded 0.672. According to Hair et al. (2014), the Kaizer–Meyer–Olkin (KMO) measure of sampling adequacy of 0.600 is considered very adequate and thus affirm the adequacy of the sample size for the factor analysis in this paper. Ideally, a KMO value of 0.5 is recommended in literature for sample size adequacy to merit factor analysis (Field, 2009). Additionally, the result of the Bartlett test of sphericity recorded 412.828 with an associated significance of 0.000 (see Table 3.0). The import of this is that, there are potential correlations among the variables and thus indicative of a reasonable potential cluster forming factors from the variables (Field, 2009; Hair et al., 2014). Likewise, the significance of the sphericity value suggests that, the population matrix realized was not an identity matrix. Also a Cronbach's alpha of 0.786 was realized suggesting an acceptable level of internal consistency and reliability in the measures and the scale (Field, 2009; Hair et al., 2014). Conventionally, a Cronbach's alpha of 0.70 is considered reasonably good for scale reliability and internal consistency of the instrument (Field, 2009).

Prior to conducting the PCA, communalities extracted on each variable were assessed and presented (see Table 4.0). The communalities are critical and useful in deciding the variables that have to be finally extracted (Field, 2009). This is because by connotation, the communalities typify the total amount an original variable shares with all other variables included in the factor analysis (Field, 2009; Hair et al., 2014).

Table 4.0: Communalities Extracted

	Initial	Extraction
Receiving conflicting information from team participants	1.000	.678
Lack of consistency in communicated information leading to lack of coordination among project team	1.000	.651
Lack of conciseness in communicated information among the project team	1.000	.313*
Misunderstanding of communicated information	1.000	.681
Receiving less information than expected from team participants for tasks	1.000	.758
Receiving more information than necessary for the tasks	1.000	.422*
Late delivery of needed communicated information	1.000	.638
Persistent distortion in meaning of communicated information	1.000	.651
Persistent change in content of communicated information	1.000	.451*
Lack of clarity in communicated information resulting in different interpretations	1.000	.585
Lack of coherency in communicated information resulting in different interpretations	1.000	.430*
Withholding of part of the information by the one who controls communication	1.000	.275*
Withholding of whole of the information by the one who controls communication	1.000	.466*
Difficulty in accessing communicated information from channels	1.000	.717
Difficulty in disseminating information among project team	1.000	.582
Lack of defined roles and responsibilities among members of the team leading to communication failure	1.000	.733

Extraction Method: Principal Component Analysis. * extractions less than 0.50

From Table 4.0, the average communality of the variables after extraction was 0.67. According to Field (2009), an average communality of the variables after extraction should be above 0.60 to support reliable results and interpretations in factor analysis. Hence, the communalities extracted support the use of factor analysis on the variables. Also, the conventional rule about communality values in factor analysis suggests that, a potential significant variable must yield an extraction values (eigenvalues) greater than 0.50 at the initial iteration (Field, 2009; Hair et al. 2014). This criterion determines the inclusion or removal of the variable for further detailed analysis. From the results presented in Table 4.0, six (6) variables had their extracted enginevalues less than the 0.50 cut-off point, suggesting that they do not explain much variance and thus were subsequently dropped from the analysis (Field, 2009; Hair et al., 2014). The remaining ten (10) variables with communalities above 0.50 were carried to the factor analysis extractions.

Following the appraisal and the conclusion of all necessary and mandatory pre-checks and preliminary tests of sampling adequacy, population matrix identity and scale reliability, the data yielded from the questionnaire survey on the communication ineffectiveness among mass housing project team was tested. The test was conducted using the PCA approach by adopting conventional varimax rotation for robust results in factor analysis (Field, 2009). By following this approach, the eigenvalue and factor loading were set at conventional high values of 1.0 and 0.5 respectively as suggested by Field (2009), Liu (2009) and Hair et al. (2014). Likewise, by adopting the latent root criterion on the number of principal components to be extracted, the total variance explained by the variables as contained in Table 5.0 indicate that, three components should be extracted from the data as their respective eigenvalues were greater than 1.00. Similarly, the Rotated Component Matrix[a] in Table 6.0 also affirmed three distinct component factors as each variable dominantly belonged to a unique factor (component). From this, it could be suggested that, these components that emerged could be perceived as the dominant underlining communication ineffectiveness experienced among mass housing project teams.

Table 5.0:Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	**Total**	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**
1	3.561	35.611	35.611	3.561	35.611	35.611	2.995	29.955	29.955
2	1.942	19.417	55.028	1.942	19.417	55.028	2.238	22.238	52.193
3	1.328	13.283	68.312	1.328	13.283	68.312	1.597	15.970	68.312
4	.726	7.265	75.577						
5	.645	6.446	82.022						
6	.565	5.652	87.675						
7	.451	4.508	92.183						
8	.411	4.109	96.292						
9	.313	3.129	99.421						
10	.058	0.579	100.000						

Extraction Method: Principal Component Analysis.
Source: Field Data

From the results presented in Table 5.0, the total variance explained by each of the three extracted component is stated as: the principal component one (1) accounted for 35.611% of the total variance whereas the second principal component accounted for 19.417% of the total variance. The third and final principal component extracted on the other hand accounted for 13.283% of the total variance in the measure of communication ineffectiveness experienced among the project team on mass housing projects. From this, it could be seen that, the total three components extracted cumulatively accounted for 68.312% of the total variance which is above the recommended minimum of 50% (Ahadzie et al., 2007; Field, 2009). The Rotated Component Matrix in Table 6.0 reveals all the variables contained in the various components extracted.

Table 6.0: Rotated Component Matrix[a]

	Component		
	1	**2**	**3**
Late delivery of needed communicated information	.896		
Lack of consistency in communicated information leading to lack of coordination among project team	.868		
Difficulty in accessing communicated information from channels	.859		
Difficulty in disseminating information among project team	.703		
Lack of defined roles and responsibilities among members of the team leading to communication failure		.834	
Persistent distortion in meaning of communicated information		.724	
Lack of clarity in communicated information resulting in different interpretations		.681	
Receiving less information than expected from team participants for tasks		.599	
Receiving conflicting information from team participants			.907
Misunderstanding of communicated information			.682

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 5 iterations.

The adoption of the rotated component matrix over the ordinary unrotated matrix was influenced by the ability to yield and achieve simple robust structure aiding easy identification and interpretation of results (Field, 2009). Beside, all the components extracted had more than one variable on it, suggesting that the results yielded are reasonable and devoid of complex structures (Field, 2009). Following a critical appraisal of the likely interrelations among the variables contained in each component and the factor loadings, a more suitable name that encapsulates the ineffective communication explained by the components was derived. By drawing on the relationship among the variables in each of the components, *Component 1* was labeled 'Access to information challenges'. *Component 2* on the other hand was labeled 'Challenges in flow of information' whereas *Component 3* was named 'Import of information challenges'. In the following section, the discussion on the various components is presented.

4.3 Discussion: Component 1: Access to Information challenges

From Table 6.0, four communication ineffectiveness indicators were extracted for this component. The variables in this component and their respective factor loadings in brackets were *late delivery of needed communicated information (89.6%), Lack of consistency in communicated information leading to lack of coordination among project team (86.8%), Difficulty in accessing communicated information from channels (85.9%) and Difficulty in disseminating information among project team (70.3%).* From Table, 5.0, the cluster of variables in this factor accounted for about 35.611% of the total variance in communication ineffectiveness among the mass housing projects team. It could be deduced that the variables in the component explains communication ineffectiveness related to untimeliness, information inaccessibility and inconsistencies.

According to Dainty et al. (2006), timely delivery of project related information being communicated is considered very crucial to the smooth progress and success of construction projects in the construction industry. Hence untimely communication can be of adverse effect to project performance. From the results, 'late delivery of needed project related communicated information has been identified as very significant communication issues among mass housing project teams. Studies by (2009) and Xie et al. (2010) revealed that, late delivery of communicated project related information required by project participants was common on traditional construction projects in Hong Kong. This finding suggests that the experience of late delivery of communicated information is common to both traditional 'one-off' projects and mass housing projects. It is emphasized that timely delivery of project related information is crucial towards building trust and improving team productivity (Henderson, 2008), communication satisfaction among work groups, teams and employees (Madlock et al., 2009) and team cohesion at the design and construction stage (Gorse and Emmitt, 2007).

Dainty et al. (2006) and Gorse and Emmitt (2007) also established that, the communication medium adopted on construction projects significantly influence the timeliness of shared communication. However, Azu (2014) revealed that, face-to-face meeting, telephone conversation and personally delivering project related information remains the dominant medium used on mass housing projects. It can be said that these media are perceived as traditional ones which unfortunately contribute to delays in information delivery (Liu, 2009). Practically, from the result, it can be suggested that, late delivery of communicated information indeed provide evidence to the degree of potential influence of mass housing unique features especially multiple project sites for housing units, different geographical location and nature of communication infrastructure on sites. Similarly, mass housing projects exhibit seemingly complex project relationships inherent from their procurement styles adopted (Oladapo, 2002; Ogunsanmi, 2012). Traditionally, mass housing project delivery in the Ghanaian context involves the packaging of housing units under different construction contractors in different geographical locations and multiple sites management under the control of same project teams. This means that sharing of communication is done across different sites and locations. Indeed, Blismas et al. (1999) and Ahadzie et al. (2014) affirmed that the multiple construction site nature of construction projects especially mass housing presents unique communication challenges often leading to delays in receiving information. Hence, these could be plausible attributions for the untimeliness in communication among the project team.

Also, other variables which together account for significance variance in communication ineffectiveness relate to lack of coordination and barriers to accessing communicated information on mass housing projects. Studies by Xie (2002) revealed that lack of coordination in project communication was the most dominant communication problem among project participants at the design phase. The development was primarily attributed to the lack of role and team co-ordination, conflicting information and poor communication skills (Xie, 2002). Liu (2009) on the other hand, affirmed that, project document management and arrangement of organizational structures are the main contributors to communication barriers on construction projects in Hong Kong and China. The emergence of barriers here is an indication that, communication dissemination and information accessibility problems are prevalent on both traditional projects and mass housing projects. On the contrary, Xie et al. (2010) revealed that, communication problems relating to barriers to information was not common at the construction stage among the design team in traditional construction building projects. Drawing on the practical and theoretical perspective of the construction industry in Ghana, project related information have traditionally been distributed by post or at meetings which are predominantly organised monthly. In recent times, communicating project information among the project team by the use of the internet has become an emerging channel and trend in project delivery in Ghana. However, practically at most mass housing construction sites, there are no accesses to reliable internet service as compared to the main offices of the mass housing developing organisation. Hence, plausibly, this is likely to account for the occurrence of this communication problem among the team on mass housing projects. This is because, lack of reliable internet access hinders the easy and timely access to shared information on mass housing projects at the construction sites.

Given that, in Ghana, untimely communication of project related information has been identified as the dominant factor contributing significantly to project delays and failures across various project typologies (Fugar and Agyakwah-Baah, 2010). It is thus of prime importance for mass housing stakeholders to be interested in developing and adapting emerging media capable of improving timely delivery of communicated information among project teams.

4.4 Discussion: Component 2: Challenges in flow of information

Component 2 which accounted for 19.42% of the variance had its respective loading factors as: Lack of defined roles and responsibilities among members of the team leading to communication failure (83.4%), Persistent distortion in meaning of communicated information (72.3%), Lack of clarity in communicated information resulting in different interpretations (68.1%) and Receiving less information than expected from team participants for tasks (59.9%). This component was subsequently named Lack of defined Protocols and Distorted Communication. Dainty et al. (2006) hinted that established protocols and defined roles are necessary for effective communication on construction projects.

Procedure in communication as used here refers to the existence, use, and effectiveness of formally defined procedures and protocols that facilitate the sharing of project related information among the team. From the results, ‘lack of defined roles and responsibilities among members of the team leading to communication therefore emerged as the significant and most critical factor in this grouping.

This finding is contrary to the report in several studies (see Dawood et al., 2002; Xie, 2002; Liu, 2009; Xie et al., 2010). The results indicate that, lack of defined roles among the project team is a dominant procedural communication problem in mass housing delivery than on traditional projects. Consequently, the emergence of communication problems relating to procedure dominant on mass housing projects demands deeper insight. It can be argued that, the emergence of this is more likely to be the influence of the multi-cultural nature of project teams and strong attachment of teams to their discipline and organizations. This according to Javidan and House (2001) and Ochieng and Price (2010) leads to lack of collectivism and eventually lack of team integration. This development makes adopted procedures and protocols for team function very difficult to operate due to strong attachment to traditional organizational culture and multi-culturalism among the team. This supports the assertion that, strong cultural diversity among project team leads to poor communication and task break down (Javidan and House, 2001; Diallo and Thuillier, 2005; Ochieng and Price, 2010).

Additionally, the results revealed that distorted and incomplete communication were also experienced in mass housing delivery among the project team. Xie et al. (2000) and Xie et al. (2010) revealed that distorted communications are common on construction projects and this is often due to the influence of varying background and technical language of the professional team. However, the result here in respect of completeness of communicated information is contrary to the account from Liu (2009) and Xie et al. (2010). This indicates that, whereas communication underload is a major communication problem among mass housing project team, it rarely happens on traditional construction project (Xie et al., 2000; Liu, 2009). However, Gluch and Raisanen (2009) indicated that overcoming communication distortions and incomplete communication is very crucial in the performance of tasks and the progress of the overall project. Given that distorted communication has been arguably identified as very significant communication problem in this factor, it is thus no denying the fact that, stakeholders must not overlook this revelation. Given the significant role clear undistorted communicated project related information plays in project delivery, it is thus considered very crucial for mass housing project teams and stakeholders to make appropriate choice of communication planning and strategies towards ensuring effective communication.

4.5 Discussion: Component 3: Import of information challenges

The third and final component 3 accounted for 13.28% of the variance with the factors and their loadings in bracket as: Receiving conflicting information from team participants (90.7%) and Misunderstanding of communicated information (68.2%). This component was named conflicting communication and misunderstanding. Conflicting information has to do with the accuracy of the communicated information (Xie et al., 2010; Dainty et al., 2006). From this factor component, *'receiving conflicting information from team participants'* emerged as the most dominant communication problem among mass housing project teams contributing about 91% of the factor. Issues of inaccurate communication emanating from conflicting information shared among construction project teams have well been acknowledged and reported in literature (see Dawood et al., 2002; Liu, 2009; Xie et al., 2010). The dominance of this problem suggests that, it is a common problem experience among teams across various project typologies in the construction industry.

Similarly, the results indicated that, misunderstanding communicated information was a problem among the team contributing to about 68% of the communication problems in the factor. This finding however, contradicts studies by Liu (2009) and Xie et al. (2010) where misunderstanding was among the least problems among the project team at the construction stage. Additionally, Bowen and Edwards (1996) previously indicated that, misunderstanding is not common in construction organizations and project teams especially at the construction stage. However, with the revelation of misunderstanding communicated project information among mass housing project team provides empirical evidence to the unique project environment compared to traditional building projects. Indeed just like accuracy of project information, the core significant of attaining clear understanding of shared information is towards performing tasks and actions to achieve zero variance in outcome (Dainty et al., 2006). Against this, Liu (2009) and Xie et al. (2010) indicated that, construction design and management is a typical interaction process which involves multi-disciplinary team participants from different domains (specialists), disciplines, organizations and cultures. This undoubtedly has been identified to significantly influence the ease of understanding of related communication shared among this multi-disciplinary team (Xie et al., 2010). However, from the practical and theoretical perspective of training of the core professionals (architects, Quantity Surveyors, engineers etc.) of the built environment in Ghana and other countries, it can be said that there are lines of technical, cultural and work language diversities. Significantly, Xie et al. (2000) established organizational and cultural diversities, poorly defined information requisition and different discipline background as the major barriers to understanding communicated project information among construction teams.

Invariably, the occurrence of distortions and misunderstanding in communication among the project team can likely be traditionally be traced to the fact that mass housing projects delivery involves a multi-disciplinary team approach with varying professional cultural, professional, technical, social and organizational background as well as variations in technical languages (Khanzadi et al., 2008; Zairul and Rahinah, 2011; Ogunsanmi, 2012). Similarly, these participants tend to lack the clear understanding of the unique attributes and challenging project environment of mass housing projects and their implications for management. Given the significance of understanding of project information among the project team, it is thus crucial for project teams to gain pre-existing patterns of work activities, specialized work language, overcome technical constraints and reduce organizational diversities. Without this, it is more likely for the multi-disciplinary team to persistently encounter misunderstanding of each other and related communication. Against this, gaining and developing common communication skills across all professional disciplines could be a valuable asset to mitigating distortions and misunderstanding of communicated information among construction project teams especially on mass housing projects.

5. CONCLUSION AND RECOMMENDATION

Against the background of limited or no empirical studies on identifying the communication problems among mass housing project team inherent from the unique attributes of mass housing projects, this paper has sought to fill the knowledge gap. By adopting quantitative survey design, the paper has empirically identified the communication problems among mass housing projects teams.

By using factor analysis, the significant communication ineffectiveness experienced among mass housing project teams have been determined to be three main clusters, named as: component 1: Access to information challenges, component 2: Challenges in flow of information and component 3: Import of information challenges. Consequently, the findings recorded in this study indicate that though some of the results seem obvious, it also further brought to light some important findings which have not so far been empirically examined in the field of construction project management practice especially on projects of unique particularities. More specifically, the results have also highlighted some communication problems which are peculiar to the mass housing project environment. It is clearly evident from the findings that communication problems inherent in the unique features and particularities of mass housing projects among the project team are evident and cannot be underestimated or ignored.

Given the empirical evidence that effective communication across all project typologies is critical and significantly influence project outcome, team effectiveness and management intuition (Dainty et al., 2006; Dawood et al., 2002; Gluch and Raisanen, 2009), the insights given by this study could be useful and offer practical and theoretical implications for planning, managing and improving the communication and strategies on mass housing project delivery. Considering that, there is the need for enhancing managerial efficiencies and communication effectiveness on mass housing projects, the findings generated can therefore help mass housing project professionals and practitioners to develop the core task and behavioural knowledge and skills related to communication to engender effective communication outcome on MHPs. This can be achieved both by training and continuous professional development. Additionally, the findings and its congruence with literature have cemented the unique attributes of mass housing in respect of repetitive tasks and housing units and its resultant potential towards standardization and uniformity in communication aided by ICT. Against this, the findings presented can be extremely significant for stakeholders to develop bespoke communication technology backbone necessary to standardize the communication tasks and functions on MHPs towards inducing effective communication among project teams and participants.

Identifying the limitations of any research helps improve its acceptance and the general applications of the findings. There are some potential limitations that should be borne in mind in the interpretation and generalization of the findings of this research. The focus of the empirical aspects of this study was entirely based on the experiences of Ghanaian construction industry. Given that practical and professional experiences may differ across countries, geographical region or continent, it is entirely conceivable that there may be significant differences and variations in the findings if this study is replicated in other countries or geographical regions. However, theoretically, it can be said that the construction industry in many developing countries especially in sub-Saharan Africa are deemed to exhibit similar practical and professional characteristics. Hence, this limitation noted here does not undermine the validity of the research undertaken and potential application of its main findings in these developing countries.

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