TIMBOU-AFRICA PUBLICATION INTERNATIONAL JOURNAL NOVEMBER, 2024 EDITIONS.

INTERNATIONAL JOURNAL OF BUILT ENVIRONMENT AND EARTH SCIENCE
VOL. 6 NO. 4 E-ISSN 3027-1606 P-ISSN 3027-0049

COMMUNICATION CHANNELS EMPLOYED BY CONSTRUCTION INDUSTRY PROFESSIONALS IN GOMBE METROPOLIS NIGERIA

[1]RAYMOND Daniel, [2]IBRAHIM Idris, [3]AUWAL Umar, [4]IBRAHIM Iliyasu, [5]MAMMAN Mathew

Department of Estate Management and Valuation, Faculty of Environmental Technology, Abubakar Tafawa Balewa University, P.M.B 0248, Bauchi State, Nigeria. [5]Department of Estate Management, College of Environmental Studies, Kaduna Polytechnic, Kaduna, Kaduna State.

Corresponding Author:
danielraymondsams@gmail.com

DOI: https://doi.org/10.70382/tijbees.v06i4.001

ABSTRACT

The research focused on the evaluation of communication channels employed by construction industry professionals in Gombe metropolis Nigeria. The following question was articulated for this paper: What are the various communication channels employed by construction industry professionals and several literatures were reviewed to arrive at the

Introduction

The beginning of global construction markets has recently begun to be felt within the sector at large as fast growing economies such as the Chinese construction industry offers massive market potential for European companies willing to invest in attempting to utilize them. However, taking advantage of new markets presents serious communication challenges. These include the difficulties of providing the language skills and cultural knowledge necessary for their employees to be able to communicate in unfamiliar environments (Irwin, 2020). Implementing building projects is a difficult activity which is carried out by

identified communication channels designed for data collection. The study used an accessible population of ten construction firms, sample frame and size of 100 and 80 respectively. A total of 80 questionnaires were distributed and 71 were retrieved. Convenience sampling method was used and data collected were presented in tables and were analyzed using the Statistical Package for the Social Sciences (SPSS) 23 version. The study found that a site review meetings is the most important channel of communication through which information can be passed across to professionals and inexperience in interpreting drawings and other technical aspects of construction work. The study recommends that site review meetings, general meetings and formal communication be employed as channels of communication when carrying out construction work. The study recommends that experienced professionals should always take the responsibility of interpreting drawings and the execution of other technical aspect of the construction work for the realization and delivery of quality projects.

Keywords: Communication Channels, Construction Industry, Construction Professionals, Gombe, Nigeria.

many specialized organizations. During the last few decades, the construction industry has been experiencing increased demands from building projects clients with respect to a wider set of use functions (Razkenari, Fenner, Shojaei, Hakim & Kibert, 2020). In other to meet these demands, building projects have become more large and sophisticated with complex works which require multiple inputs from different specialized organizations (Chan, Olawumi & Ho, 2019). These organizations then form a task based project team to implement the design, construction, and management activities in order to realize a building project (Chan et al., 2019). However, project team includes the participation of clients, architects, consultants, engineers, main contractors, sub-contractors, and suppliers saddled with the responsibility of implementing a design. Effective communication between project participants in the construction industry has a critical influence on the success of a building project. Many studies have highlighted the importance of effective communication for

project delivery in construction (Li, Song, Sang, Chen & Liu, 2019). According to Kabirifar and Mojtahedi (2019) "statistical analysis revealed that 41% of the variation in perceptions of project success can be attributable to the variation in communications effectiveness. If there is effective communication between project participants, accurate information will be quickly communicated and consensus decisions easily achieved among the project team members. Subsequently, it will improve team work, reduce conflicts and rework, and contribute to project success". Therefore, the importance of managing project team communication and achieving communication effectiveness can never be over emphasized in realizing a successful project delivery (Memedi & Dressler, 2020).

However, communication between building project participants is a complex activity and its effectiveness is difficult to achieve. Communication problems are always reported e.g. not enough information, information lately received from others, or having difficulties to access information providers in other participants. Poor communication performance may be due to the complex characteristic elements of team communication, such as communicators with different backgrounds and multiple communication channels (Chaccour, Soorki, Saad, Bennis, Popovski & Debbah, 2022). However, if such integration is to be meaningful in terms of joining-up construction activities, valuable communication channels must be developed which will enable those involved to overcome embedded functional boundaries and culturally defined practices which have prohibited integrated working in the past. Most defects in the construction industry are as the result of poor communication. For example, a poorly detailed drawing, operatives being given incorrect instructions or technical information not being available (Shakeri & Khalilzadeh, 2020). There are many research works carried out on the effect of communication on project delivery. Notably are the works of Yang, Du, Liew, Lim, Xiong, Niyato and Miao (2022) carried out in China. However, what is also not known is how construction professionals collect and disseminate timely information when carrying out construction projects, the barriers to effective communication and its effect on project delivery in Gombe metropolis. It is this noticeable gap in construction communication within the study area that this paper seeks to address.

Literature Review

Communication is fundamental to project success, especially in construction, where complex coordination is required among diverse participants across multiple project stages. This literature review examines key dimensions of communication, starting with definitions that emphasise its role in transferring information and creating shared understanding (Gong et al., 2020). Theoretical frameworks highlight communication's evolution from mathematical models to interdisciplinary approaches that underpin organisational effectiveness (Krizanova et al., 2019). Within construction, timely and accurate information sharing is crucial due to the sector's high dependence on collaborative processes (Bertram et al., 2019). Effective communication is particularly essential during the design stage, where client requirements are defined and refined (Magdy et al., 2021). Finally, communication management practices are crucial in linking team members and stakeholders to project objectives, establishing it as a critical success factor in project delivery (Muszynska, 2018). This review synthesises perspectives on communication's role in supporting project outcomes across the construction lifecycle.

Definition of Communication

Communication is typically considered as a "complex process" Gong, Lu, Hoang, Niyato, Shu, Kim and Liang (2020). In the WEBNOX dictionary, communication is simply defined as the activity of conveying information. However, the meaning of communication is much more comprehensive and all-embracing. Communication is defined in different ways by different researchers according to their perspectives. Communication can be viewed as a metaphorical 'pipeline' along which information is transferred from one person to another (Radovic, Markovic, & Salamzadeh, 2018). It is the lifeblood of any system of human interaction as without it, no meaningful or coherent activity can take place (Xiao, Zhu, Liu, Yi, Zhang, Xia, & Schober, 2021). Nonetheless, defining 'communication' is difficult as it is such a multidimensional and nebulous concept. It can have a variety of different meanings, contexts, forms and impacts and so will mean different things to dissimilar people in different situations. Some researchers emphasized media and channels used during the communication process. Xiao *et al.* (2021) opined that communication includes not only oral language and the

written documents but also symbols and body gesticulation. Others consider communication as the skills for interaction. For example, Chaccour, Soorki, Saad, Bennis, Popovski and Debbah (2022) states that communication is a means for the transmission of ideas, attitudes, or emotions from one person or group to another. Chaccour et al. (2022) considers communication in building projects and regards communication as a personal management skill. He states that communication is the basic means through which managers interact with their project counterparts. "However, according to the Project Management Institute (PMI) (2000), communication in a project context is subject to more meaning than communication skills, and the emphasis is given to information processing. Communication management is therefore defined by the institute as the process required to ensuring timely and appropriate generation, collection, dissemination, storage, and ultimate implementation of project information." The institute further argues that the communication process provides the critical links among people, ideas, and information which are necessary for the project success. Chaccour et al. (2022) defines communication in building projects as "the continuous and interdisciplinary sharing of goals, knowledge, and information among all project participants. Some other scholars, particularly in the management discipline, tend to emphasize the functions of communication. Communication is defined by them as a process of exchanging information, resulting in shared meaning and mutual understanding between two or more persons or groups. Chaccour et al. (2022) define communication as a process of one individual affecting the perceptions of another individual. Hancock, Naaman and Levy (2020) states that the function of communication is to achieve and accomplish common goals, and defines communication as a channel of influence aimed at changing personal and work relationships. Sheludiakova, Mamurov, Maksymova, Slyusarenko and Yegorova (2021) further views communication as a mechanism through which different ideas, perceptions and business goals are conciliated in order to achieve a common understanding of the meaning and an agreement on the purpose of information. Richmond and Pilgrim and Bohnet-Joschko (2019) suggest six functions that communication serves in the organizational context, which are to inform, regulate, integrate, manage, persuade, and socialize.

Theoretical Framework on Communication

Although the origin of communication dates back many hundreds of years, it is the work of the leading theorists of the twentieth century that have defined what we now understand as communication theory. Rather than developing as a coherent body of knowledge, it comprises a set of fairly disparate areas and subfields, many of which are rooted in the mathematical theories of Enke and Borchers (2021) which is research seeks to adopt as well as the social and psychological perspectives of the late twentieth century. The study of communication in organizations traditionally examines the processing and flow of information through channels and networks Krizanova, A., Lazaroiu, G., Gajanova, Kliestikova, Nadanyiova & Moravcikova, 2019). In the 1970s, communications researchers began to explore the idea that organizations are processes and not entities, and are therefore defined, created and developed by communication itself (Enke & Borchers, 2021). This view sees communication as the essence of organization and as such, fundamental to understanding how and why businesses succeed or fail.

An alternative view advanced by those who dismiss communication theory is that, it is irrelevant or too far removed from the actual practices that are found in real-life situations. Such a perspective sees the communication process as a highly complex and subjective phenomena that cannot be understood through reference to simplified theories and models (Krizanova et al., 2019). This view arguably misinterprets the purpose and value of theory, however, which is to facilitate understanding of complex situations. Theories are used to explain and describe phenomena, and as such are the logical combinations of thoughts and ideas of observers. Using theories helps people to predict and control the phenomena (Glaser & Strauss, 2017). As such, theory and practice can be seen as mutually supportive. This paper work agrees with this perspective where theory is used to help make sense of the complex interactions that define communication within the sector.

Information and Communication Requirements in Construction

Typically, the construction sector is considered one of the most information-dependent industries. For instance, a construction project chain may involve large numbers of skilled professionals and companies with, quite often, much repetition of activities and accumulation of

paperwork. Majority of these participants require access to the regular project information at one time or another (Bertram, Fuchs, Mischke, Palter, Strube & Woetzel, 2019). This means that, timely and accurate access to information is therefore important for all project participants as it forms the basis on which decisions are made and physical progress is achieved. Currently, several construction documents such as drawings, specifications, bills of quantities, correspondence, schedules, and programmes produced on construction projects are currently exchanged on paper bases and face to face communication between practitioners in industry (Yakubu, Ogunsanmi & Yakubu, 2019). Admittedly, effective collaboration between all the role players during construction is not only important but also necessary for the successful completion of a construction project. With so many interested parties, effective communication and information sharing among them is vital. Not only must the formal structures and networks be examined to understand the level of information sharing that is happening on a formal basis, but the informal relationships among parties will depend on how and when information is shared and how and when information is flowing (Kim, Park,Kim & Kim, 2022).

Communication Need in Construction

Effective communication is vital in construction due to the large number of project participants, the separation of design and construction disciplines and the geographically dispersed nature of the projects (Senaratne & Ruwanpura, 2016). Therefore, the improvement of communication in the construction industry has been a target of practitioners and researchers for many years. All construction projects generate paper data, and the larger the project, the larger the volume of records to be managed (Shakeri & Khalilzadeh, 2020). An inference that is often drawn is that, effective communications are held back by the predominantly paper-based world and that; electronic exchange and production of information should alleviate these problems (Pirzadeh, Lingard & Blismas, 2020).

Communication at Conception/Design Stage

At this stage, communication is between the client (owner) and the consultants and is a continuous process from inception to completion of the project. The client's statement of requirements which include information

such as the size of the building, nature of the building, funds available, building function and time limitation of the project will be made available to the consultants. As stated by Magdy, Eid and Khodeir (2021), it is the lack of early consultation and co-operation that has hampered communication and subsequently timely project delivery. The architect prepares a general outline of client requirements after carrying out feasibility studies with the other consultants and communicates it to the rest of the members of the design team for collective action. As soon as the client approval is obtained, the Architect and Engineer start preparing the working drawings, schedule and specification and at the same time seeking the opinion of the Quantity Surveyor who sees to the cost implication of the project to see if the project design is still within the approved budget (Raphiri, Musonda & Okoro, 2020).

Significance of Communication Management for Project Delivery

Effective communication management within virtual project teams is of paramount importance and a fundamental competency that, if properly executed, connects every member of a project team, so that they can work together to achieve the project's objectives. If communication is not managed effectively and fully understood by Project Managers, project outcomes may be at risk (Raphiri *et al*., 2020). According to PMI's Pulse research, 55 percent of Project Managers agree that effective communication with all stakeholders is the most critical success factor in project management (Muszynska, 2018). Effective project communications ensure that the right information reaches the right person at the right time and in a cost-effective manner. Communication is the key to keeping team members, managers, and stakeholders informed and on track to pursue the project objectives, as well as to identifying issues, risks, misunderstandings, and all other challenges to project completion. Effective communication is a critical element of team effectiveness, both in traditional and virtual teams (Raphiri *et al*., 2020). White and Fortune (2002) in their empirical study on practices in project management, established a list of critical success factors for a project and 'clear communication channels' was a number 6 factor on the list. It is worth noting that number 1 factor, which was 'clear goal/objectives' is also strongly dependent on clear and precise

communication. In another study on critical factors that contribute to the successful delivery of a project, the author lists 'effective communication' among the four most important factors, next to 'top management support', 'clarity of purpose and goals' and 'stakeholders involvement' (Muszynska, 2017). Effective communication techniques and appropriate leadership styles are emphasized by (Butt, Naaranoja & Savolainen, 2016). as the success factors for building and managing high performance global virtual teams. Earlier research reports that 74% of the problems in distributed projects were caused by "communication and contacts" (Benis, Barkan, Sela & Harel, 2020).

Methodology

Descriptive research design was adopted and quantitative approach was also used in this study. Study population is the target respondents to study that meets requirement to provide information (data) for the research. The target audience for this study are construction professionals comprised of quantity surveyors, builders, civil engineers, structural engineers, project managers and architects. The choice of the class of building stakeholders was made on the basis that they are reputable firms engaging the services of these professionals are construction project professionals in the study area. The sample frame is the total number of items of the study population. The sample frame of this study is 100 professionals. To determine the sample size for this research, Krejcie and Morgan's (1970) table of determining sample size was adopted. The data obtained using questionnaire survey was thoroughly screened, analysed and sorted out for analysis depicting the information responses from the respondent, as the study contained descriptive research questions, mean ranking.

Findings

Also descriptive statistics based on mean ranking was carried out to explore the level of channels of communication employed by professionals in the construction Industry in Gombe Metropolis, Nigeria. The results in table below showed the ranking, mean and relative index importance for each Item.

Ranking of channels of communication employed by professionals in the construction Industry

S/n	Communication Channels	Responses						
		SD F (%)	D F (%)	U F (%)	A F (%)	SA F (%)	Mean	RII
1	Site Review Meetings	-	-	18(25.4)	26(36.7)	27(38.0)	4.5211	0.9042
2	General Meeting	-	-	4(5.6)	30(42.3)	37(52.1)	4.4648	0.8930
3	Formal Communication	-	1(1.4)	6(8.5)	27(38.0)	37(52.1)	4.4085	0.8817
4	Team Meetings	2(2.8)	3(4.2)	5(7.0)	19(26.8)	42(59.2)	4.3521	0.8704
5	Notice Boards	-	1(1.4)	11(15.5)	21(29.6)	38(53.5)	4.3521	0.8704
6	Specification	-	3(4.2)	11(15.5)	24(33.4)	33(46.5)	4.2254	0.8451
7	Annual Reports	-	1(1.4)	10(14.1)	33(46.5)	27(38.0)	4.2113	0.8423
8	Drawings	2(2.8)	4(5.6)	8(11.3)	29(40.8)	28(39.4)	4.0645	0.8129
9	Face to face Discussions	2(2.8)	2(2.8)	13(18.3)	27(38.0)	27(38.0)	4.0563	0.8113
10	Meeting Suppliers	2(2.8)	7(9.9)	16(22.5)	15(21.5)	31(43.7)	3.9296	0.7859
11	Performance Evaluation Scheme	-	5(7.0)	20(28.2)	22(31.0)	24(33.8)	3.9155	0.7831
12	Organizational Breakdown Structure	-	5(7.0)	17(23.5)	30(42.3)	19(26.8)	3.8873	0.7775
13	Code of Conduct/Job Description	6(8.5)	3(4.2)	16(22.5)	18(25.4)	38(39.4)	3.8310	0.7662
14	Training including induction	3(4.2)	10(14.1)	11(15.5)	24(33.8)	23(32.4)	3.7606	0.7521
15	Policies	3(4.2)	9(12.7)	14(19.7)	26(36.6)	19(26.8)	3.6901	0.7380
16	Public Relation	2(2.8)	10(14.1)	16(22.5)	31(43.7)	12(16.9)	3.5775	0.7155
17	Work Breakdown Structure	4(5.6)	14(19.7)	16(22.5)	23(32.4)	14(19.7)	3.4085	0.6717
18	News Letter	9(12.7)	10(14.1)	10(14.1)	29(40.8)	13(18.3)	3.3803	0.6761
19	Web Site	6(8.5)	11(15.5)	17(23.9)	28(29.4)	9(12.7)	3.3239	0.6648
20	Employee Suggestion Scheme	11(15.5)	16(22.5)	8(11.3)	24(33.8)	12(16.9)	3.1408	0.6282
21	Customer Satisfaction Survey	1(1.4)	18(25.4)	30(42.3)	19(26.8)	19(26.8)	3.0704	0.6141

22	Compensation Design	10(14.1)	11(15.5)	21(29.6)	27(38.0)	2(2.8)	3.0000	0.6000
23	Employee Manual	9(12.7)	20(28.2)	20(28.2)	13(18.3(	9(12.7)	2.9014	0.5803
24	Customer Complaint System	12(16.9)	19(26.8)	18(25.4)	16(22.5)	6(8.5)	2.7887	0.5577
25	Social Gathering	14(19.5)	16(22.5)	20(28.2)	13(18.3)	8(11.3)	2.7887	0.5577

Out of the total of 71 respondents, 38% of the respondents strongly agreed, 36.7% agreed while 25.4% were undecided that site review meetings between the clients, project consultants and contractors with the highest mean score of 4.5211 is the most important channel of communication and plays a vital role in achieving construction project success. It is therefore ranked first (1) among other channels. General meetings with a mean score of 4.4648 was ranked second (2) in order of importance, Formal Communication with a mean 4.4085 was ranked third (3), Team meetings with a mean score of 4.3521was ranked fourth (4) All other factors in the table above were also ranked in order of importance with regards to communication among professionals in construction. However, Customer complaint system and social gathering with mean scores 2.7887 each, ranking twenty fourth (24) were the least important channels of communication identified in the table. In their investigation on interpersonal communication behavior between designers and contractors during the construction phase of projects, the findings of Aljuwaiber (2019) revealed that informal approaches such as face-to-face are perceived to be the most effective medium of communication within the industry. Their results were also supported by Dart, Cunningham-Nelson and Dawes (2020), they conducted their research on communication within the Swedish and Ghanian construction industries respectively. These findings indeed agreed to some extent with the outcome of this research. From the channels of communications responses as seen in table 6 above, it was clearly shown that site meetings, general meetings, formal communication and team meetings plays a vital role in achieving a successful construction project in Gombe State. It was observed that all the various communication channels that dealt with some form of face to face contact interaction had the highest number of respondents as what is truly taking place on construction site in Gombe metropolis. For instance;, site meetings, general

meeting team meetings as well as face to face discussion even though ranked 9th in the list, seem to happen at every construction site within the study area. One character of communication is that information is transferred from one place to the other. In an organizational context, this generally means that there will be a flow of information from the top management down through different project levels. On every level however, a part of the information disappears or changes significantly. According to Carlsson *et.al*. (2001) the information reaching the bottom of the line may be entirely different from what is started at the top and are often misunderstood. These channels of communication were identified through literature review and were similar to some channels of communication identified by previous research works conducted by Iglesias-Pradas, Hernandez-Garcia, Chaparro-Peleez and Prieto (2021). However, this study focused on the effectiveness of communication on project delivery in Gombe state and as such agrees with the channels identified by Iglesias-Pradas *et al.* (2021) evaluating the effects of communication in construction project delivery in Nigeria and an assessment of project communication management on construction projects in Ghana respectively. The two research studies used 3 points ranking system in analyzing the response contained in the questionnaires distributed and also defer in scope. The findings of this research work using Likert scale shows that, site review meetings, general meeting, formal communication and team meetings in order of priority are the most important channels of communication that are necessary for project delivery and should be employed during the execution of construction project. Channels such as employee manual, customer complaint system and social gathering are the less significant channels to be considered in achieving a successful delivery of construction projects.

Conclusion

From the responses gathered from construction professionals within the construction industry in Gombe State, there was a strong understanding of project communication and its importance within the industry. With regards to the specific communication channels, there were undisputed agreements of the importance of each of the communication channel on

project site. For example, majority of the professional respondents agreed that site meetings are an important channel of communication among professionals. Again, most of the respondents also responded that general meeting is necessary for onsite communication. However, construction professionals have largely used the following channels of communication; site meetings, general meetings, formal communication (email, letter, telephone, fax), team meetings, notice boards, specification, annual reports, drawings, face to face discussions, meeting suppliers/customers, performance evaluation scheme, organization breakdown structure, training, policies and public relations What have not been used frequently on construction sites includes compensation design, employee suggestion scheme, customer satisfaction survey, employee manual, customer complaints system and social gathering. Within the study area, there is a strong awareness of the importance of project communication within the construction industry. Indeed, various channels of communications between clients, consultants and contractors have been established to be in practice within the construction industry, This research has shown that, communication between professionals in the construction industry using the appropriate communication channel strongly affect the performance of professionals and will result to the timely delivery of any construction work within the study area and in Nigeria at large. This communication channels mostly employed presented in descending order includes site review meetings, general meetings, and formal communication including emails, phone call and letters. On-going communication between project proponents and its stakeholders should be improved for a construction project to be successful. The study recommended that frequent site meetings, general meetings and team meetings should be organized during construction to help overcome communication barriers and also increase performance level.

References

Aljuwaiber, A. (2019). Technology-based vs. face-to-face interaction for knowledge sharing in the project teams. *International Journal of Project Organisation and Management*, *11*(3), 227-242.

Benis, A., Barkan, R. B., Sela, T., & Harel, N. (2020). Communication behavior changes between patients with diabetes and healthcare providers over 9 years: Retrospective cohort study. *Journal of Medical Internet Research*, *22*(8), e17186.

Bertram, N., Fuchs, S., Mischke, J., Palter, R., Strube, G., & Woetzel, J. (2019). Modular construction: From projects to products. *McKinsey & Company: Capital Projects & Infrastructure*, 1-34.

Butt, A., Naaranoja, M., & Savolainen, J. (2016). Project change stakeholder communication. *International Journal of Project Management*, *34*(8), 1579-1595.

Chaccour, C., Soorki, M. N., Saad, W., Bennis, M., Popovski, P., & Debbah, M. (2022). Seven defining features of terahertz (THz) wireless systems: A fellowship of communication and sensing. *IEEE Communications Surveys & Tutorials*, *24*(2), 967-993.

Chan, D. W., Olawumi, T. O., & Ho, A. M. (2019). Perceived benefits of and barriers to Building Information Modelling (BIM) implementation in construction: The case of Hong Kong. *Journal of Building Engineering*, *25*, 100764.

Dart, S., Cunningham-Nelson, S., & Dawes, L. (2020). Understanding student perceptions of worked example videos through the technology acceptance model. *Computer Applications in Engineering Education*, *28*(5), 1278-1290.

Enke, N., & Borchers, N. S. (2021). Social media influencers in strategic communication: A conceptual framework for strategic social media influencer communication. In *Social Media Influencers in Strategic Communication* (pp. 7-23). Routledge.

Glaser, B. G., & Strauss, A. L. (2017). *The discovery of grounded theory: Strategies for qualitative research*. Routledge.

Gong, S., Lu, X., Hoang, D. T., Niyato, D., Shu, L., Kim, D. I., & Liang, Y. C. (2020). Toward smart wireless communications via intelligent reflecting surfaces: A contemporary survey. *IEEE Communications Surveys & Tutorials*, *22*(4), 2283-2314.

Hancock, J. T., Naaman, M., & Levy, K. (2020). AI-mediated communication: Definition, research agenda, and ethical considerations. *Journal of Computer-Mediated Communication*, *25*(1), 89-100.

Iglesias-Pradas, S., Hernández-García, Á., Chaparro-Peláez, J., & Prieto, J. L. (2021). Emergency remote teaching and students' academic performance in higher education during the COVID-19 pandemic: A case study. *Computers in human behavior*, *119*, 106713.

Irwin, H. (2020). *Communicating with Asia: Understanding people and customs*. Routledge.

Kabirifar, K., & Mojtahedi, M. (2019). The impact of Engineering, Procurement and Construction (EPC) phases on project performance: A case of large-scale residential construction project. *Buildings*, *9*(1), 15.

Kim, E. W., Park, M. S., Kim, K., & Kim, K. J. (2022). Blockchain-Based Automatic Tracking and Extracting Construction Document for Claim and Dispute Support. *KSCE Journal of Civil Engineering*, *26*(9), 3707-3724.

Krizanova, A., Lăzăroiu, G., Gajanova, L., Kliestikova, J., Nadanyiova, M., & Moravcikova, D. (2019). The effectiveness of marketing communication and importance of its evaluation in an online environment. *Sustainability*, *11*(24), 7016.

Li, Y., Song, H., Sang, P., Chen, P. H., & Liu, X. (2019). Review of Critical Success Factors (CSFs) for green building projects. *Building and Environment*, *158*, 182-191.

Magdy, A., Eid, A., & Khodeir, L. (2021). Obstacles to applying knowledge management in small enterprises in the Egyptianconstruction sector, Review. *International Journal of Architectural Engineering and Urban Research*, *4*(1), 41-66.

Memedi, A., & Dressler, F. (2020). Vehicular visible light communications: A survey. *IEEE Communications Surveys & Tutorials*, *23*(1), 161-181.

Muszyńska, K. (2017). Patterns of communication management in project teams. In *Conference on Information Systems Management, Conference on Advanced Information Technologies for Management* (pp. 202-221). Springer, Cham.

Muszyńska, K. (2018). A concept for measuring effectiveness of communication in project teams. *Journal of Economics & Management*, *33*, 63-79.

Pilgrim, K., & Bohnet-Joschko, S. (2019). Selling health and happiness how influencers communicate on Instagram about dieting and exercise: Mixed methods research. *BMC public health*, *19*(1), 1-9.

Pirzadeh, P., Lingard, H., & Blismas, N. (2020). Effective communication in the context of safe design decision making. *Safety science*, *131*, 104913.

Radovic Markovic, M., & Salamzadeh, A. (2018). The importance of communication in business management. In *Radovic Markovic, M., & Salamzadeh, A.(2018). The Importance of Communication in Business Management, The 7th International Scientific Conference on Employment, Education and Entrepreneurship, Belgrade, Serbia*.

Raphiri, M. M., Musonda, I., & Okoro, C. S. (2020). Indicators of Management Capability in Small and Medium-Sized Construction Organisations: A Literature Review. *Supporting Inclusive Growth and Sustainable Development in Africa-Volume I*, 311-323.

Razkenari, M., Fenner, A., Shojaei, A., Hakim, H., & Kibert, C. (2020). Perceptions of offsite construction in the United States: An investigation of current practices. *Journal of Building Engineering*, *29*, 101138.

Senaratne, S., & Ruwanpura, M. (2016). Communication in construction: a management perspective through case studies in Sri Lanka. *Architectural Engineering and Design Management*, *12*(1), 3-18.

Shakeri, H., & Khalilzadeh, M. (2020). Analysis of factors affecting project communications with a hybrid DEMATEL-ISM approach (A case study in Iran). *Heliyon*, *6*(8), e04430.

Shakeri, H., & Khalilzadeh, M. (2020). Analysis of factors affecting project communications with a hybrid DEMATEL-ISM approach (A case study in Iran). *Heliyon*, *6*(8), e04430.

Sheludiakova, N., Mamurov, B., Maksymova, I., Slyusarenko, K., & Yegorova, I. (2021). Communicating the Foreign Policy Strategy: on Instruments and Means of Ministry of Foreign Affairs of Ukraine. In *SHS Web of Conferences* (Vol. 100, p. 02005). EDP Sciences.

Xiao, Z., Zhu, L., Liu, Y., Yi, P., Zhang, R., Xia, X. G., & Schober, R. (2021). A survey on millimeter-wave beamforming enabled UAV communications and networking. *IEEE Communications Surveys & Tutorials*, *24*(1), 557-610.

Yakubu, G. A., Ogunsanmi, O. E., & Yakubu, A. O. (2019). Influences of communication problems on project performance in Nigeria. *African Journal of Engineering Research*, *7*(3), 74-84.

Yang, W., Du, H., Liew, Z. Q., Lim, W. Y. B., Xiong, Z., Niyato, D., ... & Miao, C. (2022). Semantic Communications for Future Internet: Fundamentals, Applications, and Challenges. *IEEE Communications Surveys & Tutorials*.