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Stakeholders Perceptions on Causes and Effects of Delay on Educational Institutional Projects in Niger State

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Development of economy in every nation is based on construction projects undertaken through several types of contracts. However, construction industry is suffering from delay phenomenon that affects its performance. Therefore, this paper aimed to establish the main causes and effects of delay on educational institutional projects in Niger State. One hundred numbers (100) of questionnaires were distributed to the professionals in the construction industry such as Architect, Quantity Surveyor, Project Manager, and Civil Engineer. Thus only 96 were retrieved for computation of the result and discussion. Descriptive method of analysis was adopted for the data analysis through the use of mean, standard deviation and ranking system. The result shows that insufficient funding, non-payment for completed works, cash flow problem during construction and interference with project performance are the main factors causing delay in educational institutional projects in Niger State. However, the followings were established as major effects of delay on educational institutional projects in Niger State. These are: abandonment of building projects, time and cost overrun, loss of productivity in construction projects and disputes between contractor and clients. The followings were also established as mitigation measures to overcome the challenges of delay on educational institutional projects in Niger State. These are: use of appropriate construction method, systematic control mechanisms, proper emphasis on the past experience and developing human resources in the construction industry. The paper therefore, recommended that the management of construction projects in educational institutions should use appropriate construction method and systematic control mechanism to enhance project delivery. In addition, the top management of construction industry needs to adopt effective strategic management approach through the proper planning and scheduling.

Keywords: Construction Projects, Construction Firms, Educational Institution, Project Delay, Project Delivery

Introduction

Delay in construction affects the key players in the construction industry including the contractors, clients and consultants. The Nigerian construction industry has suffered many setbacks in terms of completing projects on time. Furthermore, most of the construction projects in Nigeria experienced delay, which lead to the abandonment of the project (Mohammed & Isah, 2012). In addition to other countries, Malaysian construction industry has been affected by project delays for many years (Akogbe *et al.*, 2013). It is significantly interesting, to study the delay effects in construction industry because research shows that seventy percentages 70% of projects in Nigerian suffered delay in their execution (Ameh & Ogundare, 2013). These increase in project delays in the construction industry is hurting the economy because it results in wastage of resources, hike cost of project delivery and frustration among the key players (Mohammed & Isah, 2012). Yet construction industry is one of the principal sectors that can revitalize economic growth

in Nigeria (Mohammed & Isah, 2012). Investment in construction projects and related infrastructure and service has multiple direct and indirect effects on economy of the nation. Unfortunately, delay in educational institutional projects in Niger State especially buildings, will continue to plague the construction industry in the foreseeable future, unless professionals in the built environment understand the effects of delay on project delivery. Although much has been done in identifying the factors that influence projects delay in construction projects in Nigeria and yet the industry still experiences delay (Owolabi *et al.,* 2014). This is attributed to the fact that there is still lack of knowledge to address the effects of projects delay. This research therefore, seek to fill the gap that exist by contribute to these attempts of previous researches in identifying further the factors that causes projects delay in educational institutional projects in Niger state with a view to establish the effects of delay on project delivery.

Literature Review

Delay is a term that being referred to as time and cost overrun in construction projects (Memon *et al.,* 2011). Hamzah *et al.* (2012) added that delay is time overrun or extension of time for accomplishment of a project. Construction delay is the action or situation that fallouts in finishing the project later than agreed in the contract. A delay can also affect the starting or finishing a specific activity later than planned (Mubarak, 2010). However, the definitions above captured time and cost but has to be related to the one agreed in the contract or at the inception stage of the project. Menesi (2007) described project delay as the accumulated effect of the delays in the individual activities. Definition of project delay given here lacks some terms. Budgeted cost and contract initial period are the most important terms that supposed to be mentioned, because the factors of delay affect cost and time first before anything else in the construction industry. Amongst the key players of the industry, contractor normally became the prime victim of delay factors for the fact that contractor is responsible for all the acts and omissions of the contractor's employees, subcontractors, their agents and employees, and any other person performing work under a contract with the contractor (Ayudhya, 2011). Upon all the research conducted, different perceptions on definitions were given to projects delay. Therefore, this paper deduced from the previous researches and described delay as unconditional stoppage of construction activities for certain reasons beyond the control of the contractors.

Construction projects delay is associated with three main causes (Hackett & Statham, 2007; Ren *et al.,* 2008) namely delay caused by contractor, employer or his representatives and those by events that are out of both the contractor and employers and it is termed as 'act of God'. Financing by contractor during construction, project delays in contractor's payment by client, design changes by client or his agent during construction activities, partial payments during construction, and non-utilization of professional construction/contractual management act as the most common causes of delay in construction projects (Abd El-Razek, *et al.,* 2008). Ali, *et al.* (2010) stated in their research that labour shortage, contractors' financial difficulties, construction mistakes and defective works were the most common causes of projects delay. Furthermore, the research mentioned the effects of delays on construction projects are: cost overrun, extension of time, late payment, rescheduling, affect company reputation and loss of productivity and efficiency. Ali, *et al.* (2010) shows that cost overrun and extension of time have significant effects on contractor. However, the contractor reputation did not fall in to one of the common effects in this research, despite its advantage. Therefore, looking further to investigate and substantially justify the effects of construction projects delay on contractor's reputation become very much important.

Factors causing Delay in Nigerian Construction Industry

According to Mohammed and Isah (2012), delay factors in the Nigerian construction

industry particularly contractor's related are improper planning, lack of effective communication, , shortage of supply like steel, financial issues, shortage of material, cash flow problems during construction, increase in quantities and mismanagement by the contractor, conflicts in work schedules of subcontractors, contractors regarded contractual relationships, site accidents, negligence, late deliveries of materials and equipment, liquidated damage and disputes. Financial difficulties faced by the contractors, failure to pay for completed works, shortages of resources, escalations of material prices, late delivery of materials, fluctuations in resources cost, poor contract management, resource management problems, inadequate contractor's experience, lack of communication, inaccurate site inspection, "lowest bid wins" system, labour disputes and strikes, poor technical performance/workmanship, subcontracting systems (Akinsiku & Akinsulire, 2012). In another perspective, Sunjka & Jacob (2013) conducted a research on the causes of delay in Nigerian construction industry and outlined the followings: poor coordination of subcontractors, inappropriate construction methods, inadequate planning, inadequate experience, mistakes during construction stage, incompetent site management, wrong choice of bankers, unskilled site manpower, improper equipment selection and faulty equipment, labour disputes, poor quality materials and material shortages as delay factors related to contractor. Therefore, it is important to further research on the effects of delay on contractor reputation in the Nigerian construction industry.

Effects of Projects Delay in Construction Performance

Based on the research conducted by Gündüz *et al.* (2013) time frame extension, increase in cost due the extension of time, government periodic budget and plan execution, and cost overrun are the effects of delays on construction projects. Gündüz *et al.* (2013) further added reputation is always at stake in delay cases and the government risks losing public confidence, also the depressing condition is subject to litigation and arbitration. Gündüz *et al.* (2013) stated in their research that delays have serious effect on construction organizations, which results to increase in cost of the project, loss of opportunity cost, damage in reputation, arbitration, litigation and even to the worse situation of abandonment of the project. However, scholars concerned on the effects of delays on construction organisation in general, its effects on the reputation of the organisations since reputation is an intangible asset and it affects future business.

Delay in completion of projects includes an increased overheads and loss of opportunity of taking on other profit-earning projects with the resources tied down on the delayed project (Ndekugri *et al.*, 2008). This indicate that delay has effect on the construction projects. The effects of this delay affect the contractors, clients and consultants in the projects. However, the paper confirmed various effects of delay in construction projects. Cost and time overrun, disputes, arbitration, litigation and total abandonment were the effects of projects delay on construction projects (Motaleb & Kishk, 2010; Abedi, *et al*., 2011; Gündüz *et al.*, 2013). In addition, Mehdi Riazi, *et al.* (2011) mentioned that, loss of opportunity cost and reputation damage was the effects of delay in construction projects delivery. Ashnaari *et al*. (2010) conducted a research and confirmed that increased disputes and costs, loss of outputs, create social problems, affects social and economic conditions in the project is being built were effects of projects delay. Although Alnuaimi, *et al.* (2010) stated effects of projects delay as time overrun, claims and disputes, cost overruns, affect the performance and moral of labor and additional costs due to variations.

Effects of Construction Delay in the Nigerian Construction Industry

According to Akinsiku & Akinsulire (2012), effects of delay are always unbearable on construction projects. They also stated that the effects are cost and time overruns, interest accumulation on capital to finance,

wastage and under-utilization of man power resources and claims. It further stated that under-utilization of equipment, loss of confidence on the contract (therefore jeopardizing the reputation of contractor in the case of future tendering chances) and late returns of income are effects of delay. Among the effects also include reduction of employment opportunities, dispute between parties involved, aids the decrease in the tempo of economic activities in the nation, additional insurance charges, extra taxes and dues due to delay (Ali *et al.,* 2010).

Methodology

This study adopted quantitative research approach via survey questionnaire to sample individuals from a population with a view towards making statistical inference about the population using the sample (Creswell, 2011). To pull out public opinion, such as beliefs, perception, ideas, views and thought about the causes and effects of delay on educational institutional projects in Niger State. In order to obtain the require population for this study, the stratified random sampling technique was adopted for the selection of the construction firms that participated in this study. This selection was in line with concept of Creswell & Tashakkori (2007) that respondents are arranged in strata for the convinienency in questionnaire distribution and assessment. In addition, simple random sampling was adopted in each of the construction organisations for the selection of construction professionals from the strata.

The questionnaire that was used to record the responses of each respondent contained mainly closed ended questions using a five-point Likert scale ranged from very high; high, slightly high, low and none. The scores of the respondents were computed based on the variables used in the questionnaire. Although, this study focused in Niger State owned tertiary institution projects. And the projects in questions are Niger State Government projects in thus institutions. Therefore, the questionnaire was distributed to the professionals and organisations that are involved in thus projects. One hundred (100) numbers of questionnaire were distributed in the followings organisations: (1) Niger State Ministry of Work and Housing, (2) Niger State Housing Corporation, (3) Niger State Urban Development Board, (4) Work and services Department of Niger State owned educational institutions, (5) Consultants and (6) Contractors. These professionals are: Quantity Surveyors twenty numbers (20), Architects twenty numbers (20), Civil Engineers twenty numbers (20), Contractors ten numbers (10), Consultants ten numbers (10) and Project managers twenty numbers (20). However, only ninety-six (96) numbers of the distributed questionnaires were filled correctly and returned.

The inferential statistic was adopted to summarise the sample. In this paper, descriptive statistic was used to present means score, standard deviation and frequency counts. The mean score was used to ranked the respondents' opinions or responses obtained.

Findings and Discussion of Results

The results of the study are presented below

Nature of Organisation

Figure 1 shows that 28% of respondents works with construction firms 19% were with consulting firms while 37% and 16% were from client and project financier organisations.

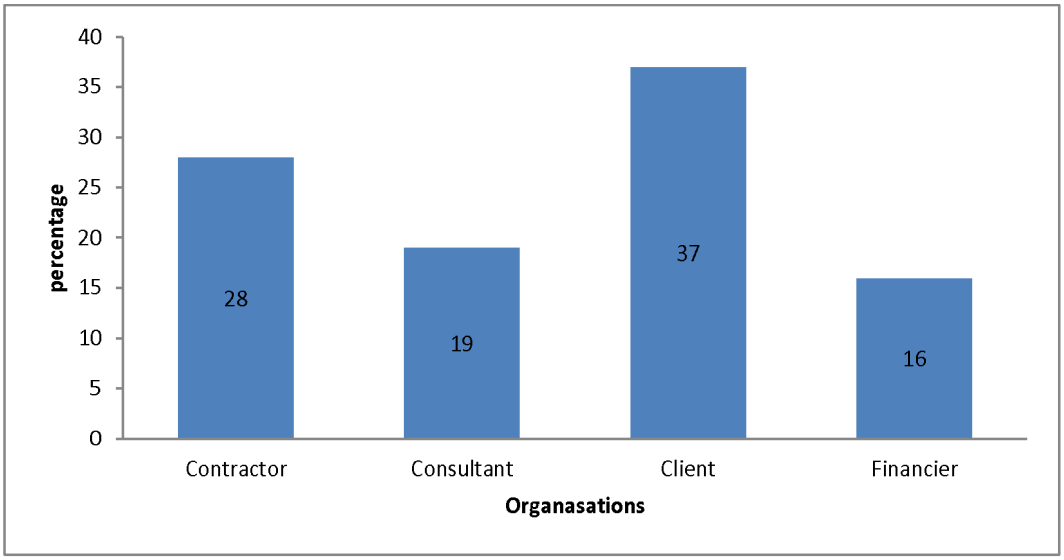

Figure1: Nature of organisation

Respondents Position in the Organisation
Figure 2 indicates that 11% of respondents sampled for the study were Architects in their respective organisations, 26% were Quantity Surveyors, while 18% 24% and 21% held positions of Project Managers, Contractor and Civil Engineers respectively. Inferences drawn from this was that the respondents sampled are knowledgeable enough to comprehend the contents of the questionnaires, thus providing suitable responses.

The Professional Bodies of Respondents
Figure 3 indicates that 19% of respondents had professional membership of Nigerian Institute of Builders (NIOB), 28% were holders of Nigerian Institution of Quantity Surveyors (NIQS), while members with NIA, NSE and NITP were 22%, 17% and 14% respectively. Inferences drawn from this was that the respondents sampled are certified professional with adequate knowledge related to the aim of this study to comprehend the contents of the questionnaires, thus providing suitable responses.

Years of Experience of Respondents in Construction
Figure 4 shows that 10% of respondent's sample had years of working experience of less than 5 years in the building industry, 19% had between 5- 15 years of working experience, while 30% had spent 11 -15 and 41% had 15 years of working experiences in the building industry. This above indication that the respondents had spent reasonable time within the industry to have familiarizes with issues related to delay in building projects.

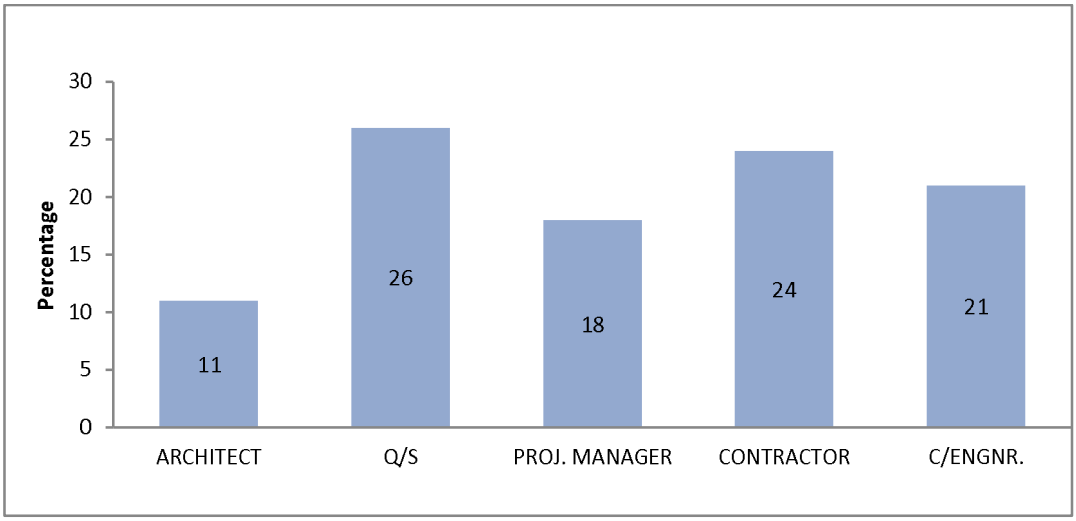

Figure 2: Respondents position in organisation

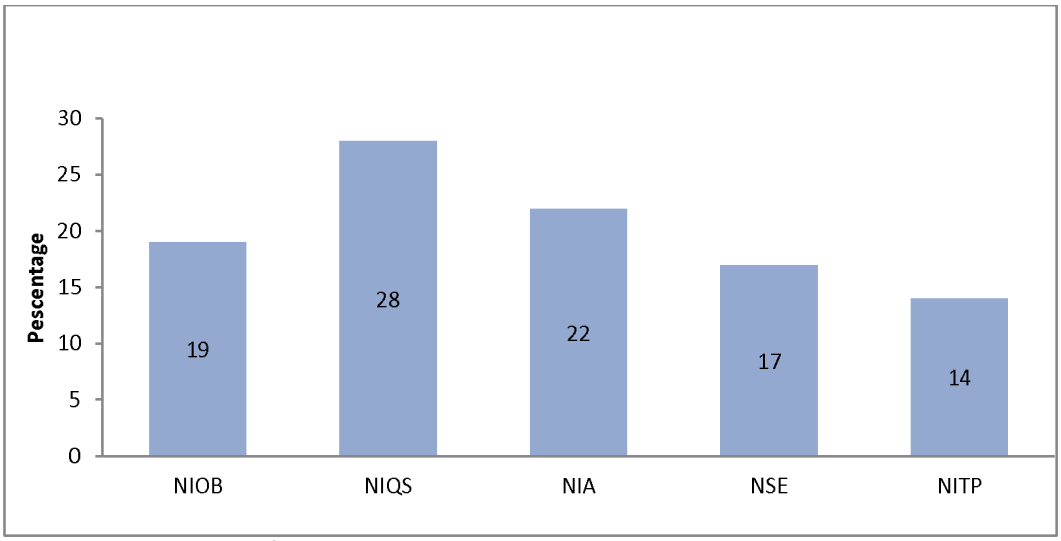

Figure 3: Respondents professional body

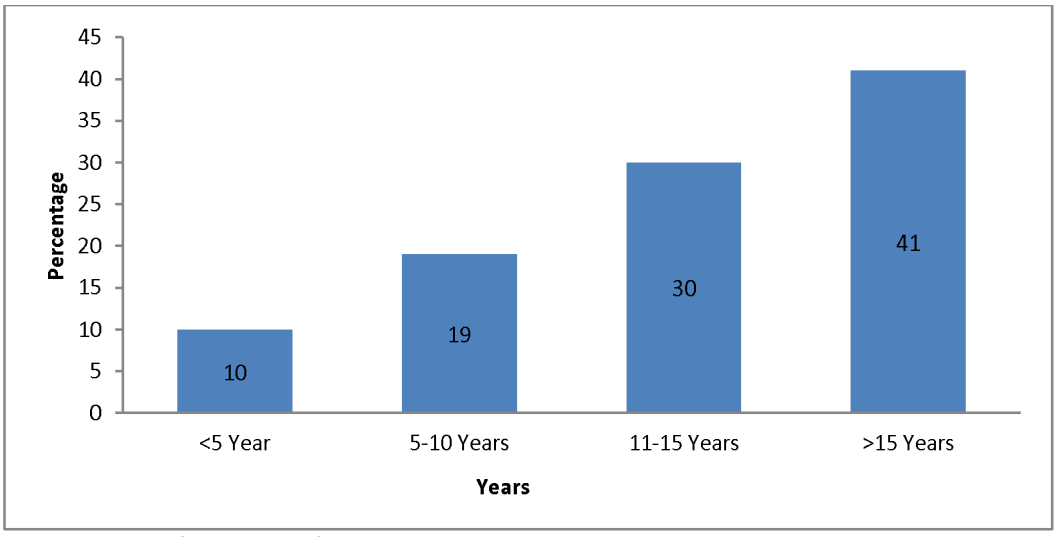

Figure 4: Years of experience of respondents in construction

Causes of Project Delayed in educational Institutions

This section covered client related factors, contractor related factors, consultant related factors and external related factors that caused delay in project delivery. Each factor of delay was studied using the Statistical Mean Score to examined level of important such as 4.5 to 5.0= very high, 3.5-4.49= high, 2.5-3.49= moderate, 1.5-2.49= Low, 0.0-1.49= None. The ranking of delay factors which were examined by the researcher from the view point of all respondents were shown in Table 1 to 5 respectively.

Table 1 shows that fourteen (14) factors were identified in this group from literature. The mean scores revealed that: insufficient funding (4.25), delay or non-payment for completed works (3.94), cash flow problem during construction (3.89), interference with project performance (3.86) and financial issues were top most five factors of delayed of building project in Niger state thus ranked 1st, 2nd, 3rd, 4th & 5th respectively. This result agrees with (Yates & Epstein, 2006) that outlined the followings as main causes of delay in projects delivery: design alteration, disputes, insufficient funding, slow decision and lack of prompt payment of interim certification to contractor on the sections completed.

In the same way, increase in quantities, impractical allocation of resources, slow decision making, date of notice to proceed and wrong choice of consultant and contractors were ranked 6th., 7th, 8th, 9th and 10th with statistical mean values of 3.73, 3.65, 3.62, 3.58 & 3.54 respectively. Findings are in agreement with Muhammad, (2010) studied that failure of contractor to mobilize the site and start the work in a timely manner, delay in the submission of shop drawings to the owner for approval, inadequate construction equipment and defective works were responsible for delayed in progress of works.

Meanwhile, design alteration and change order, unrealistic contract duration and dispute variation order had statistical mean values of 3.44, 3.27 & 3.14 and were ranked as 11th, 12th & 13th respectively. Although these factors were having a mean score between 3.14 & 3.44 and this shows that there were slightly highly responsible for delay in project delivery. These results were in line with the findings of Tawil, *et al.,* (2013) study in Nigeria which established the following as causes of delay in construction projects: financial issues, slow decision making, interference with project performance and cash flow problems.

Table 1: Client related factors causes delay

Client Related Causes of Delay	Mean scores	S. dev	Rank
Insufficient funding	4.25	.87	1
Delay or non-payment for completed works	3.94	1.0	2
Cash flow problem during construction	3.89	.92	3
Interference with project performance	3.87	1.07	4
Financial issues	3.86	1.10	5
Increase in quantities	3.73	1.01	6
Impractical allocation of resources	3.65	.94	7
Slow decision making	3.62	1.06	8
Date of notice to proceed	3.58	.76	9
Wrong choice of consultant and contractors.	3.54	.81	10
Design alteration and change order	3.44	1.20	11
Unrealistic contract duration	3.27	.89	12
Dispute variation order	3.14	.82	13
Possible prejudice	1.68	1.23	14

Table 2 examined contractor related factors responsible for delay in project performance. it was revealed from the table that out of twenty eight (28) factors identified by the study, nine (9) factors which includes: project management issues, inappropriate construction method, mistake during construction stage, improper planning, lack of effective communication, shortage of supply like steel, and concrete, financial matters and indicative of experience, with the corresponding mean values of 4.74, 4.70, 4.67, 4.67, 4.64, 4.64, 4.59, 4.59 & 4.53 were ranked 1st, 2nd, 3rd,4th,5th,6th,7th,8th,and 9th respectively. The mean scores related to these factors were observed greater than 4.50. This indicates that the aforementioned above factors are the main causes of delays in construction projects under the contractors related causes. Findings from the above is in agreement with Muhammad, (2010) study which outline the following as causes of delay: lack of effective communications, inappropriate construction method, mistakes during construction projects and financial matter.

Furthermore, conflict in works schedule of subcontractor (3.87), contractor regarded contractual relationship (3.86), experience of project team (3.85), quality assurance /control, poor coordination (3.81), site accident (3.79), negligence (3.72), late delivery of materials & equipment (3.66), economic condition (3.65), liquidated damages (3.61), negotiation during construction (3.53) and inadequate experience (3.49), were ranked 10th, 11th, 13th, 14th, 15th, 16th, 17th, 18th, 19th, 20th, 21st, & 22nd respectively. The inferences drawn from the analysis indicated that the factors mentioned above are responsible for delay of construction projects in educational institutions in Niger State.

Table 3 substantiated the factors causing delay in educational institutional projects in Niger State by projects consultants. It was discovered from the table via statistical mean scores that: inappropriate design is the most significant factors causes delay in construction projects with a mean score of (3.93) and ranked 1st, this was preceded by poor contract management (3.81) and ranked 2nd. While design errors, late preparation of drawings and other contract documents, improper contract packaging/delivery strategy, over inspection, long waiting time for inspection & testing, inappropriate coordination of information, change orders and mistakes and discrepancies in contract documents and quality assurance/control have mean scores of 3.81, 3.76, 3.73, 3.64, 3.58, 3.55, 3.53 & 3.51 respectively and ranked 3rd, 4th, 5th, 6th, 7th, 8th, 9th and 10th respectively. The mean scores of these factors were observed to have valued more than average indicating that they were responsible for delay in construction projects in educational institutions in Niger State. However, findings from the study were in agreement with the study of Marzouk & El-Rasas, (2014) that conducted a quantitative analysis of construction delays by examining the records of 130 public building projects constructed in Jordan during the period 1990 – 1997.

Conversely, from the analysis the factors with lowest mean values were: long period of approval of tests and inspections (3.25), experience of project team (3.24), failure of RIBA plan of work application (3.21) and late identification & resolution of drawings (3.13) and specification error and omission (3.11) respectively were ranked 11th, 12th, 13th, 14th & 15th respectively.

Table 2: Contractor related factors causes delay

Contractor Related Causes	Mean scores	S. dev	Rank
Project management issues	4.74	.73	1
Inappropriate construction method	4.70	.92	2
Mistaken during construction stage	4.67	.92	3
Improper planning	4.64	.87	4
Lack of effective communication	4.64	.85	5
Shortage of supply like steel, and concrete	4.59	.89	6
Financial matters	4.59	.79	7
Indicative of experience	4.53	.97	8
Conflict in works schedule of subcontractor	3.87	1.02	9
Contractor regarded contractual relationship	3.86	1.00	10
Experience of project team	3.85	1.20	11
Quality assurance /control	3.81	1.05	12
Poor coordination	3.79	.96	13
Site accident	3.72	.878	14
Negligence	3.70	1.21	15
Late delivery of materials & equipment	3.66	1.22	16
Economic condition	3.65	1.14	17
Liquidated damages	3.61	1.22	18
Negotiation during construction	3.58	.926	19
Inadequate experience	3.53	1.20	20
Possible prejudice	3.49	1.32	21
Change order and mistake	3.42	1.11	22
Incompetent site management	3.42	1.22	23
Wrong choice of bankers	3.41	1.19	24
Dispute	3.40	1.28	25
Shortage of material	3.30	1.42	26
Management by the contractor (Financial, suppliers support	2.35	1.11	27

Table 3: Consultant Related Causes of delay

Consultant Related Causes	Mean scores	S. dev	Rank
Inappropriate design	3.93	.866	1
Poor contract management	3.89	.975	2
Design errors	3.81	.974	3
Late preparation of drawings and other contract documents	3.76	.796	4
Improper contract packaging/delivery strategy	3.73	1.193	5
Over inspection	3.64	.934	6
Long waiting time for inspection &testing	3.58	.996	7
Inappropriate coordination of information	3.55	.798	8
Change orders and mistakes and discrepancies in contract documents	3.53	.771	9
Quality assurance/control	3.51	.921	10
Long period of approval of tests and inspections	3.25	.912	11
Experience of project team	3.24	.932	12
Failure of RIBA plan of work application	3.21	1.127	13
Late identification & resolution of drawings & specification error & omission	3.13	1.278	14
Conflict of the drawing and specification	3.11	0.78	15

Table 4 shows the external related factors that were observed to have responsible for delay in projects delivery. Five factors were identified by the study, the factor with highest mean score values are natural disasters (e.g. floods, lightning strikes) having a mean scores of 4.42 and ranked 1st. while weather conditions had a mean score of 4.33 and ranked 2nd, similarly, change in government's leadership & politics (3.70), interference by political leaders (3.59) and religious factors (3.58) were ranked 3rd, 4th, & 5th respectively.

The results obtained in Table 5 shows the followings as main effects of delay on educational institutional projects. These are abandonment of building projects, cost overrun of construction projects, litigations in construction projects, reduction in contract profits, disputes among the key players, arbitration in construction projects and loss of confidence on the contract by the community. These were ranked 1st, 2nd, 3rd, 4th, 5th, & 6th, with the followings mean scores 4.87, 4.72, 4.69, 4.54, 4.52 and 4.51 respectively. However, the finding from the study were in agreement with Aibinu and Jagboro, (2002) and Tumi *et al.* (2013) that delay affect the client funding budget because the contractor can claim for damages for all the causes emerged from the side of the client or his representatives. In addition, Ibbs *et al.* (2011) conducted a similar study and established the followings as effects of delay on construction projects: in adequate planning, loss of confidence on the contract by the community, abandonment of projects, low performance of contractor and time and cost overrun. Conversely, Zakaria *et al.* (2012) argued that the main impact of delay on construction projects are time and cost overrun disputes among the key players, wastage of resources and low-quality output.

In addition, the followings were considered with as low effects on educational institutional projects. These are inadequate cost control, lack of efficiency by the contractors, termination of contract, reduction of contractor's, quality of work, confidence on economic activities, wastages and underutilization. These were ranked low with followings mean scores 2.38, 2.21, 1.97, 1.76, 1.61 and 1.55 respectively.

Conclusion

Based on the findings of this research, the study concludes that, insufficient funding, non-payment for completed works, cash flow problem during construction and interference with project performance are the major factors that causes delay in educational institutional projects in relation to clients. While, contractor related causes of delay in educational institutional projects in Niger State are: management issues, inappropriate construction method, mistake during construction stage and improper planning. Furthermore, consultant related causes of delay are: inappropriate design, poor contract management, design error, late preparation of drawing and other contract document. In the aspect of external related causes are natural disaster, weather conditions, change in government leadership/ politics and interference by political leaders. The research also concludes that the major effects of construction delay are abandonment of building projects, cost overrun of construction projects, litigations in construction projects, reduction in contract profits, disputes among the key players, arbitration in construction projects and loss of confidence on the contract by the community.

The followings were recommended based on the findings:

- The management of construction projects in educational institutions should use appropriate construction methods and systematic control mechanism.
- There is need for development of human resource management and proper emphasis on past experiences in order to improve productivity.
- There is need for comprehensive contract administration through the use of up to date technology
- The top management of construction industry need to adopt effective

strategic management approach, through proper planning and scheduling.

Table 4: External Related Causes

External Related Causes	Mean scores	S. dev	Rank
Natural disasters (e.g. floods, lightning strikes)	4.42	.918	1
Weather conditions	4.33	.937	2
Change in government's leadership & politics.	3.70	1.264	3
Interference by political leaders	3.59	1.186	4
Religious factors	3.58	1.200	5

Table 5: Effects of projects delay on educational institutions

Effects of Construction Delayed	Mean scores	S. dev	Rank	Remarks
Abandonment of building projects	4.87	1.05	1	Very High
Cost overrun in construction projects	4.72	1.11	2	
Litigation in construction projects	4.69	1.12	3	
Reduce the contract profits	4.54	1.01	4	
Dispute between contractor and client	4.52	1.14	5	
Arbitration in construction projects	4.51	0.98	6	
loss of confidence on the contract by the community	4.51	1.23	7	
Low performance of contractor	4.48	1.03	8	High
Late payment to sub- contractors	4.43	1.24	9	
Rescheduling of works in projects	4.10	1.06	10	
Loss of productivity in construction projects	3.87	1.21	11	
Inadequate planning	3.64	1.15	12	
Variations in the project scope	3.52	1.00	13	
Incompetent project manager	3.48	0.95	14	Moderate
Delay in progress payment by client	3.23	1.08	15	
Reduction of employment opportunities	3.09	1.11	16	
Faulty design	2.98	1.20	17	
Wrong estimate	2.87	1.11	18	
Unrealistic contract duration by the clients	2.69	1.26	19	
Shortage of materials	2.54	1.15	20	
Blacklist by authorities	2.52	1.01	21	
Difficulties in attracting foreign loan	2.50	1.27	22	
Inadequate cost control	2.38	1.08	23	Low
Lack of efficiency by the contractors	2.21	1.10	24	
Termination of contracts	1.97	.74	25	
Quality of work	1.76	.97	26	
Reduction of contractors' confidence on economic activities	1.61	1.16	27	
Wastage and under-utilization	1.55	1.20	28	

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