

Issues of the Industrial Training Programme of Polytechnics in Ghana: The Case of Kumasi Polytechnic

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Abstract

The purpose of the study was to explore some issues of students' industrial training programme at Kumasi Polytechnic. Data were collected from 282 students by simple random survey through self completion questionnaire based on a four point Likert scale. Data were analyzed using descriptive statistics and one-way ANOVA. The findings revealed that the overall state of preparation of students for the attachment programme was suitable. The study established, among the challenges that students had competition for attachment places from other institutions, tough work environment for students, high expectations by firms; financial challenges and lack of appropriate skills, tasks and jobs. Finally, strategies that could improve the attachment programme were proposed and it summed up as strong relationship between the Polytechnic and industry. It was recommended that Polytechnic education should be given the needed resources and recognition to produce graduates who may end up solving the problems of the nation.

Keywords: Kumasi Polytechnic, industrial attachment, education, graduates, industrial liaison office and unemployment

1.1 Introduction

Most developed countries around the world have developed because of the existence of institutions that provide technical and technological training to a greater part of their citizens. These institutions are designed to address employment and human resource capacity challenges by producing hands-on entrepreneurs and skilled middle level managers to enhance productivity and development of the economy. Since independence Ghana had witnessed not less than 12 educational reforms and not too long ago the national focus was on only one link of the academic chain, thus basic education (GNA, 2013). Polytechnics in Ghana, as enshrined by the Polytechnic Act 745 of 2007, are to provide tertiary education through full time courses in the field of manufacturing, commerce, science, technology, applied social science and applied arts. It is also to pursue such other areas as may be determined by authorities of the polytechnics for the time being responsible for higher education as well as to encourage study in technical subjects at tertiary level (Dagyenga, 2013). Polytechnics were designed to address Ghana's employment and human resource capacity challenges by producing hands-on entrepreneurs and skilled middle level man-power to enhance the productivity and development of the Ghanaian economy.

The strength of polytechnic education is the practical training it emphasises. Polytechnic education is structured to offer complete practical training in many professional fields. The aim is to make an engineer out of the mechanical student, make an accountant out of the accounting student, and to make a designer out of the interior architecture student, and not merely to school the students through the principles and theories of their programmes.

In the field of work, Polytechnic graduates have often distinguished themselves with their hands-on application of problem-solving skills. Where they have found themselves in other tertiary institutions for advanced education in their chosen fields, the Polytechnic student has been observed to command a competitive advantage because of their practical experience. Polytechnics in the country are doing very well in terms of innovations that improve the life of the citizenry. Notable among them include the 'fufu' pounding machine invented by the Kumasi and Koforidua Polytechnics, the solar wheel chair invented by the Kumasi Polytechnic among other inventions (Dagyenga, 2013). It is a fact that the government of Ghana wants to ensure the production of a well educated, skilled and informed population; a population that is capable of utilizing its knowledge and skills to transform the key sectors of the economy for wealth creation and poverty reduction.

Unemployment is a global trend, but it occurs mostly in developing countries of the world, with attendant social, economic, political, and psychological consequences (Emeka, 2011). Over the years, graduate unemployment has been a major problem for this country and successive governments have not been able to solve it as expected. Getting employment in Ghana is very difficult and job creation has turned to become the only solution. The massive youth unemployment in any country is an indication of far more complex problems. The situation of unemployment in Ghana has been on the increase which has resulted in increase in social vices, human capacity under-utilization; increased poverty amongst the citizenry, social alienation and weak purchasing power among

other negativity ((Njoku & Ihugba, 2011). Contemporary debate focuses on employability skills, which expresses a view that graduates must come to workplaces ready to hit the ground running (Sheldon & Thornthwaite, 2005) in order to better face increased competition in the graduate employment market (Orrell, 2004). Instead of building and applying skills through workplace practice, employers are seeking graduates with a range of technical and generic skills that minimize additional on-the-job training by employers (Patrick *et al.*, 2008).

In line with the objective of the Polytechnics to train skilled middle-level manpower for the nation, industrial attachment for students is mandatory for all students as a requirement and a core component of the programmes to equip students with the skills needed for post-qualification employment. This is so because the simulated work environment in school, however, differs significantly from that of the real workplace environment in which most students of our technical and vocational institutions will eventually be required to function (Roegge, Wentling & Bragg, 1996). Industrial attachment is a system on the job training for white collar and professional careers, therefore, students are expected to practice the things they learned in school. The effectiveness of preparation of students for the job market through industrial attachment depends on the training institutions and employers to pursue training programmes, which would be complementary to each other. It is important for training institutions to aim at establishing links with industries for technical development and to know their skill gaps as well as to improve quality of training and obtaining materials for teaching and case study to have a balanced assessment of trainees. The essence of industrial attachment is to develop the practical and competence of trainees and provide them with the requisite knowledge to contribute their quota towards developing society (GNA, 2012).

Industrial attachment was introduced in the Polytechnics for the purpose of attaching students to industries for them to acquire practical skills in their occupational areas and to acquaint themselves with how new technologies, machines and equipment they have heard of and read about in books function. High unemployment among Polytechnic and University graduates had raised alarm in many quarters. Special initiatives have been introduced by the state with the view of equipping the graduates with market relevant skills so that they would be able to secure jobs. The underlying assumption is that many of the unemployed graduates lacked the skills sought by employers. To help mitigate unemployment among graduates, Polytechnics have been asked to design their programmes to meet the market demand. Kumasi Polytechnic is a public tertiary institution in the Ashanti Region of Ghana. It is one of the well-known, elegant and vibrant Polytechnics in Ghana. Kumasi polytechnic has since 1993, come a long way to make its mark in the country as a strong and creditable tertiary institution. It has been making steady strides in its quest to fulfil its mandate of training the critical manpower needed for commerce and industry in Ghana (Kumasi Polytechnic, 2013). The Polytechnic established the Industrial Liaison Office (ILO) and charged it with the responsibility to co-ordinate Industrial Training Programme for students and lecturers of the Institution to enable them gain practical work experience in the relevant industries. This is a precautionary step taken by the management to ensure that theoretical knowledge is not separated from workplace skills.

1.2 Statement of the problem

Today's fast moving, technology-driven world demands hands-on skills for survival in the employment market. Over the years, graduate unemployment has been a major problem for this country and successive governments have not been able to solve it as expected. To achieve this ambition, industrial training programme was introduced in the Polytechnics for the purpose of attaching students to industries for them to acquire practical skills in their occupational areas and to acquaint themselves with how new technologies, machines and equipment they have heard of and read about function. The essence of industrial attachment is to develop the practical and competence of trainees and provide them with the requisite knowledge to contribute their quota towards developing society and meet industrial standards after school. From all indications, there is a very big gap between academia and industry, and this is one of the major causes of graduate unemployment in the country. Our educational institutions seem to be producing only academicians, who end up not solving the problems of the day. Courses are still being taught in our educational institutions with obsolete equipment and technologies while the industry looks on. The high rate of unemployment, poverty and poor socio- economic status of most Ghanaian graduates has generated an outcry of many organizations, parents, governments and international organizations. The ILO facilitates the attachment process for Kumasi Polytechnic students. However, issues have been raised by some students about the challenges they go through to secure places for attachment.

It is therefore prudent to explore some issues of students' industrial training programme in one of our prestigious Polytechnics.

1.3 Purpose of the study

The purpose of the study was to assess the preparation for and challenges of the industrial training programme at Kumasi Polytechnic. The study also discusses some strategies for effective attachment programme. The specific objectives are:

I. To examine the adequacy of preparation of students for industrial attachment.

- II. To identify the challenges associated with the students' industrial attachment programme.
- III. To determine strategies for effective implementation of the industrial attachment programme.

1.4 Research Questions

The research is guided by the following questions:

- I. What is the state of preparation of students for industrial attachment?
- II. What are the challenges associated with the students' industrial attachment programme?
- III. What strategies can be adopted to make the industrial attachment programme effective and successful?

1.5 Significance of the study

The need to secure a society with adequate job opportunities, job security and a balanced economy is necessary for the youth of Ghana. Polytechnic education is practical skills oriented, therefore it helps in the maximum creation of jobs. Findings from this study will be used as guideline to improve the industrial attachment programme. It is hoped that this study can contribute to the development of an industrial training curriculum for Polytechnics. It will also provide information for government and other organizations on the importance of investing in Polytechnic education for nation building and development. Finally, it will spice the debate at conferences and workshops on the mandate of the Polytechnics in achieving visible results in capacity building, unemployment reduction and self employment amongst their graduates, which will in turn lead to national economic growth.

2. METHODOLOGY

2.1 Design of the Study

The study utilized both the qualitative and quantitative approaches. The qualitative methods were used to capture the various perceptions on the preparation, challenges and strategies to improve the industrial attachment programme at Kumasi Polytechnic. The quantitative method was used to establish the differences in the perception of level 200 and 300 students regarding the themes under consideration. The study was a survey in nature and case study in form. This design is useful when a study is concerned with the conditions or relationships that exist at a given place. The design was appropriate because the study sought to assess the nature of prevailing conditions of the students industrial attachment programme. A case study is a strategy for doing research which involves an empirical investigation of a particular contemporary phenomenon within its real life context using multiple sources (Yin, 2003). It is also an evidence study which probes deeply and analyses interactions between the factors that explain present status or that influence change or growth. The strategy gives a rich understanding of the context of a research and the processes being enacted. It also has a considerable ability to generate answers to questions 'why, what and how', and provides sources of new research questions. The study was conducted at Kumasi Polytechnic, the number one Polytechnic in Ghana.

The target population comprised of all the students in levels 200 and 300 of the six faculties and two institutes of the Polytechnic community. As a result of the impossibility of covering the whole population and also to give credibility to the study, simple random sampling was used to choose 172 students in level 200, and 110 students in level 300. These were students who had gone for industrial attachment during their long vacations at least for once.

2.2 Data Collection Instrument

To harness the necessary information, a 30- item self designed questionnaire made up of four sections was developed by the researchers. Section A was on personal data which sought to ascertain among others the basic information of the students. Section B sought information on the evidence of preparation. Students were asked to determine how early preparation for the industrial attachment was carried out. Section C dealt with challenges facing students on industrial attachment programme. Section D delineates strategies to improve effectiveness of the industrial attachment programme. The questionnaire sought information on a 4-point likert scale. The weightings of the scale were; very late =1, late =2, early =3, and very early =4 for section B items, while; strongly agree =4, agree =3, disagree =2, and strongly disagree =1 for sections C and D items. The mean rating for each item was computed and then compared with the theoretical mean rating of 2.50 to determine whether respondents agreed or disagreed with the statements. The researchers distributed the questionnaire with the help of colleague lecturers, teaching assistants and class leaders. The instrument was trial tested on 30 students who were not used in the study. The reliability of 0.94 was calculated using Cronbach Alpha technique. This value was considered appropriate for the study.

2.3 Method of Data Analysis

Descriptive statistics (Mean and decision) were used to answer the research questions. A mean of 2.5 and above indicate agreement with the statement while a mean of below 2.5 indicates disagreement. A one-way ANOVA was further conducted at an alpha level of 0.05 to determine any differences.

3. RESULTS

Table 1 revealed the demographic information of respondents where majority (67.4%) were males and 32.6%

females. The ages of the students also indicated that most of the respondents (67.4%) were within 20-24 years while a minority of 7.8% fell within 15-19 years. The remaining 24.8% were above 25 years. About 61% of the students were level 200 students and 39% level 300 students. As for place of attachment of the students, 53.2% did their attachment in public organisations. 43.3% were placed in private organisations and the remaining 3.5% did their attachment in charities and other places.

Table 1: General information of respondents

Elements (n = 282)		Frequency (%)
Gender	Male	190 (67.4)
	Female	92 (32.6)
Age	15-19	22 (7.8)
	20-24	190 (67.4)
	25+	70 (24.8)
Level	200	172 (61)
	300	110 (39)
Place of attachment	Private Org.	122 (43.3)
	Public Org.	150 (53.2)
	NGO/Others	10 (3.5)

The mean ratings of each item on the evidence of early preparation for attachment were computed as presented in Table 2. The computed means were compared with the theoretical mean of 2.50 to determine the early or late nature of the statements. Among the seven items dealing with early preparation for attachment, only two items were rated below the theoretical mean by both level 200 and 300 students, indicating the lateness of those items. The remaining items were in agreement to the early preparation of students for industrial attachment.

Table 2: Evidence of early preparation of students for industrial attachment programme

No.	Elements of evidence of preparation	Mean & Decision	
		Level 200	Level 300
5.	Attachment letters are given out to students on time	2.58 (Early)	2.78 (Early)
6.	Attachment openings are declared to students on time	2.63 (Early)	2.65 (Early)
7.	Orientation for students are organised on time	2.66 (Early)	2.56 (Early)
8.	Students welfare issues are addressed before the start of attachment	2.49 (Late)	2.11 (Late)
9.	Alternative places are provided for students when their intended choices fail	2.19 (Late)	1.95 (Late)
10.	The ILO provide the needed information to students prior to each attachment period	2.58 (Early)	2.76 (Early)
11.	Students are mentally, psychologically and physically prepared for the programme	2.72 (Early)	2.51 (Early)

Based on the research findings in Table 2, a one-way ANOVA analysis was used to assess the statistical significance of the differences between level 200 and 300 students perception on the evidence of early preparation for industrial attachment. Table 3 indicates no difference in perception of the two groups of students. The ANOVA was not significant, $F(1, 12) = 0.299, p > 0.05$.

Table 3: Summary of the ANOVA between level 200 and 300 students on early preparation for industrial attachment

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	0.020064	1	0.020064	0.299254	0.594378	4.747225
Within Groups	0.804571	12	0.067048			
Total	0.824636	13				

Table 4 shows the mean ratings of the items on the challenges of industrial attachment programme. The respondents were asked to determine their agreement or disagreement with the eleven items under consideration. Among the eleven items dealing with the challenges of industrial attachment programme, only one item (item 13) was rated below the theoretical mean. Most of the students agreed that the remaining ten items are real challenges facing the industrial attachment programme at Kumasi Polytechnic.

Table 4: Challenges of the industrial attachment programme

No.	Elements of Attachment challenges	Mean & Decision	
		Level 200	Level 300
12.	There is a poor attitude of partnership Firms/industries towards the programme	2.57 (Agree)	2.67 (Agree)
13.	Poor attitude of students towards the programme	2.36 (Disagree)	2.11(Disagree)
14.	Firms/industries are suspicious of students on the attachment program	2.69 (Agree)	2.73 (Agree)
15.	Students spend a lot of time in finding placement for the industrial attachment	3.26 (Agree)	3.38 (Agree)
16.	Supervision from workplace supervisors is not effective	2.51 (Agree)	2.51 (Agree)
17.	Students do not have free access to machines and equipment to work with	2.66 (Agree)	2.71 (Agree)
18.	High cost involved in pursuing the programme	3.06 (Agree)	3.24 (Agree)
19.	Lack of training materials in the Firms/industries	2.64 (Agree)	2.69 (Agree)
20.	Lack of appropriate skills, tasks and jobs relating to student's programme of study	2.80 (Agree)	2.76 (Agree)
21.	Difficulty in getting attachment placement close to where the students live	3.29 (Agree)	3.60 (Agree)
22.	Lack of financial support from industries to students on attachment in terms of transport and food	3.43 (Agree)	3.71 (Agree)

Difference between level 200 and 300 students on the challenges of the industrial attachment programme is shown in Table 5. Summary of the ANOVA indicates that there was no difference on the challenges of the two groups, $F(1, 20) = 0.172, p > 0.05$.

Table 5: Summary of the ANOVA between level 200 and 300 students on the challenges of industrial attachment programme

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	0.032073	1	0.032073	0.171976	0.682776	4.351243
Within Groups	3.729909	20	0.186495			
Total	3.761982	21				

Eight strategies were used to seek the perception of the students on how to make the industrial attachment programme effective. Table 6 reveals that mean ratings of all the items were scored above the theoretical mean showing that majority of the students agreed that all the items are good strategies to make the programme effective.

Table 6: Strategies for effective industrial attachment programme

No.	Strategies for improvement	Mean & Decision	
		Level 200	Level 300
23.	Improve the relationship between the Polytechnic and industries	3.52(Agree)	3.60 (Agree)
24.	There should be an early follow-up so that supervisor can make their inputs	3.48 (Agree)	3.40 (Agree)
25.	Supervision from workplace supervisors should be encouraged	3.37 (Agree)	3.36 (Agree)
26.	Feedback from the industries/firms should be discussed with students	3.38 (Agree)	3.38 (Agree)
27.	There should be post attachment seminar for students and supervisors	3.48 (Agree)	3.35 (Agree)
28.	workplace supervisors should be trained on how to train students on attachment	3.31 (Agree)	3.27 (Agree)
29.	There should be a workshop for all stakeholders involved in the programme to reach a common consensus	3.29 (Agree)	3.51(Agree)
30.	There should be an effective supervision from both the Polytechnic and industry	3.44 (Agree)	3.47 (Agree)

Difference between level 200 and 300 students regarding the strategies for making the industrial attachment programme effective proved no significant difference as depicted in Table 7, $F(1, 14) = 0.034, p > 0.05$.

Table 7: Summary of the ANOVA between level 200 and 300 students on the strategies for effective industrial attachment programme

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	0.000306	1	0.000306	0.034126	0.856088	4.60011
Within Groups	0.125638	14	0.008974			
Total	0.125944	15				

4. DISCUSSIONS

Learning in the workplace environment is different from that of the Polytechnic's environment. Industrial attachment Training is an important component in the training of Polytechnic students. Indeed, tertiary institutions in Ghana tend to introduce an attachment component to their courses irrespective of the discipline of studies with the intention of ensuring their students are fully prepared for the job market. Mention needs to be made that industrial attachment does not only exposes students to real situation but also help develop key competencies in the students. As such most of Kumasi Polytechnic programmes have a compulsory industrial attachment component. The outcome of this industrial attachment depends on how students are prepared for it, the challenges they face and the system administered by the institution.

Evidence of early preparation

Based on the research findings in Table 2, the students confirmed that their placement letters are given to them on time given them equal chances to compete with their colleagues from other similar institutions. Meanwhile, the ILO declares available openings to the students as early as possible. As indicated by the survey results, students asserted that they receive orientation early enough to get them prepared for the attachment programme. In addition, information relating to the attachment programme and needed by the students is made available to them and this emphasises what Derrick (1969) postulated that; students should be made aware of the objectives of industrial training, namely acquisition of professional, social and skills recognition, enhancement of personality and acquisition of status and money. The overall implication on the preparation of students for the industrial training programme is enough to get the students prepared mentally, psychologically and physically for the programme and this augment what Truelove (1997) said about making students aware of the objectives makes students gain intrinsic motivation and confidence for the programme. Contrary to the early preparation posited by the students, they however indicated that issues relating to their welfare are not addressed before they start the programme. It was also clear from the results that alternative places are not provided for students when their intended choices fail and even if alternative places are sought for them, it normally comes late.

Based on the research findings, a one-way ANOVA analysis was used to assess the statistical significance of the differences between level 200 and 300 students perception on the evidence of early preparation for industrial attachment. The results indicated no significance differences were found between the two groups of students; $F(1, 12) = 0.299, p > 0.05$. This makes it clear that both groups perceived issues relating to the preparation in the same way.

Challenges of the industrial attachment programme

Evidence from the results in Table 4 demonstrated that the challenges outlined to the students were all real. As indicated by the results, the mean of students' perception on ten challenges of the attachment programme were between the ranges of 2.51 to 3.71, thus indicating an overwhelming agreement with the challenges. The challenges identified by the students are: poor attitude of partnership firms/industries towards the programme; suspicion of students on the attachment program by firms; lot of time in finding placement for the industrial attachment; ineffective supervision from workplace supervisors; students do not have free access to machines and equipment to work with; high cost involved in pursuing the programme; lack of training materials in the firms/industries; lack of appropriate skills, tasks and jobs relating to student's programme of study; difficulty in getting attachment placement close to where the students live and lack of financial support from industries to students on attachment in terms of transport and food. All the identified challenges can be found in what Carlson (2002) identified as challenges that are associated with industrial attachment, thus, competition for attachment places from other institutions; rough and tough work environment for students; male dominated working environment for female trainees and high expectations by firms accepting students. Olugbenga (2009) also revealed that students on industrial attachment also face financial challenges. In contrast to the challenges proved by the students, they disagreed with the assertion that students have poor attitude towards the industrial attachment programme. This result which was odd among all the challenges might have been so as it borders much on the students themselves. Therefore, if this type of perception is to be ignored by the ILO, it could always affect the effectiveness of the programme. The issue of students not having free access to machines and equipment to work with justifies the assertion of Olugbenga (2009), who argues that for effective training to take place and to create skills that are relevant to the future during industrial attachment, institutions of training must have up to date technology. However, the Polytechnic lack this and the technological environment is also constantly changing making it difficult for institutions of higher learning to keep abreast with the changes.

According to Finch and Crunkilton (1999) failure of institutions of higher learning to keep abreast with technology is as a result of numerous constraint including finances. As emphasizes by Lucas (2005) that learners must have access to the full range of modern equipment utilized in industry for training to be effective, this was not the case as established by the study.

Empirical evidence indicated no significant differences between level 200 and 300 students on the challenges of the industrial attachment programme. The ANOVA in Table 5 indicates that there was no difference on the challenges by the two groups, $F(1, 20) = 0.172, p > 0.05$.

Strategies for effective attachment programme

Findings from Table 6 disclosed that the students agreed with all the eight strategies that were proposed to improve the effectiveness of the industrial attachment programme. The proposition of improved relationship between the Polytechnic and industry is utmost and this outcome is congruent with Kemp and Foster (1995) assertions that industry can influence the learning of undergraduates to produce a potential workforce with the academic knowledge and flexibility they will require; students can learn firsthand the type of demands which will be made on them when they enter the world of work and are hence better prepared; academics and industrialists can work together on projects of mutual interest and can pool their expertise and experience to achieve the best results. Meanwhile the results also indicated that there should be an early supervision from the Polytechnic while work place supervisors are encouraged to make the supervision achieve the needed objectives as supported by Baechle and Earle (2008) who argued that effective attachment should achieve desired objectives. Society must establish what worthwhile knowledge is; desirable attitudes and relevant skills as it is the ultimate employer of the students after school and this is why the students agreed that there should be discussions for all stakeholders to contribute to the improvement of the programme. Again, Dickinson (2010) concurs with the need for relevance of curricula but suggests that industry must play a key role in the development of curricula, thus the need for strategic link between industry and institutions of learning. Furthermore, it is undoubtedly a fact that true integration of theoretical and practical knowledge is best fostered when students transform abstract theories and formal knowledge for use in practical situations and, correspondingly, when they apply their practical knowledge to construct principles and conceptual models. Industrial attachment is an indispensable component of developing students' competences in their areas of specialization and the process can only achieve desired results if students are placed under the supervision of experienced and seasoned personnel (Arikewuyo, 1999). From the responses in Table 6, one could therefore conclude that if the stated strategies are vigorously pursued, there is no doubt that the industrial training programme would be effective and produce the expected Polytechnic graduate who may be capable of theorizing practice and putting theory into practice to develop expert knowledge.

5. CONCLUSIONS AND RECOMMENDATIONS

Industrial training is viewed as an important strategy to expose Polytechnic students to real work life and to equip them with the necessary skills so that they would be job ready when they graduate. Basing on the findings of the study it can be concluded that students receive their letters, information and orientation on time. Attachment openings are also declared on time. On the contrary, alternative places are provided late and issues of their welfare are also addressed late. The overall state of preparation of students for the attachment programme was deemed early. Regardless of the early preparation some challenges were established; competition for attachment places from other institutions, rough and tough work environment for students, high expectations by firms; financial challenges; lack of appropriate skills, tasks and jobs and a host of others. Despite the challenges faced, one can conclude that industrial attachment remains important and relevant in training students in tertiary institutions.

Finally, strategies that could improve the attachment programme were proposed and it summed up as strong relationship between the Polytechnic and industry. The study, therefore, recommends the following:

- The state should provide logistics and administrative support to firms that offer attachment places to students.
- Polytechnic education should be given the needed resources and recognition to produce graduates who may end up solving the problems of the nation.
- The ILO must organise post attachment seminar to review the programme regularly.
- The follow-up (supervision) must be done early so that supervisors can make suggestions to the industries early.
- Orientation should be given to employers to fully understand their role in the student's academic development.

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