

Improving Jewellery Production through the Uses of Dies and Punches: Perspectives from Gold and Silversmiths in Kumasi – Ghana

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Abstract

This article which employs descriptive and phenomenological study sought to establish an understanding of local gold and silversmiths on the uses of dies and punches in the production of jewellery. The study reveals that gold and silversmiths in Kumasi were not able to explore their ideas using embossing methods because they relied solely on the imported dome blocks and metal punches which could only produce domes and half dome forms which are used for onwards use as pendants, earrings and necklace. It also brought to light that prices of precious metals for jewellery is a major factor in pricing jewellery products but the adaptation of appropriate methods such as the making and usage of dies and punches in the studio practice would contribute to the reduction of overall cost of the end product. Local gold and silversmiths should be trained to make their own dies and punches to reduce their production cost.

Keywords: Jewellery, Embossing, Dies set, Gold and Silversmiths

1. Introduction

To stay competitive in the jewellery business, a jeweller should consider the method he or she employs. This is paramount because, in the jewellery industry, the technique which is used to produce articles has a direct bearing on the cost of the finished product. The reason is that the final cost of every finished artwork such as precious metal jewellery is determined by the cost of materials used and the production cost. The cost of materials such as gold, silver, and copper is determined by external forces (world market prices) which a jeweller has no control over. However, the jeweller has control over a technique of production which can be fast, efficient and can help control the weight of the material and achieve quality of works as well. In doing this a jeweller can bring the cost of his/her finished products down to an appreciable level to meet the demand of the masses and the pockets of prospective jewellery buyers.

Though there are many techniques which are considered as techniques of the industrial world such as casting, electroforming, stamping and photographic processes, this article focuses on the gold and silversmiths understanding on the uses of dies set as a tool for improving jewellery production in Ghana. Rajput (2007) states that the die set consists of a die and a punch with the desired contours, so that when the punch and the die meet, the clearance between them is the same as that of the sheet's thickness.

Dies and punches are used to emboss images out of metal sheet either in cameo or intaglio. Codina (2007) reveals that embossing is commonly used, especially in the mass production of jewellery, since this process produces a very fine thickness of metal that is also very strong and durable. Given the great number of pieces that can be made, the result is vast savings in production cost. He adds further that making a steel punch and die is the most common method used in the industry since it offers greater durability and precision.

Bawa (2004) gives the following as advantages of using dies and punches for stamping metal:

- (i) Weights of fabricated parts are less;
- (ii) Production rate is high;
- (iii) Parts that are produced are very accurate in size;
- (iv) Strength of components is well controlled; and
- (v) Cost of labour is low.

The need to understand gold and silversmiths knowledge on the use of dies and punches is undoubtedly crucial and the acceptance of it would improve their jewellery production as stated earlier by Bawa. In this paper, I report on the investigations into gold and silversmiths' perspectives on how they use dies and punches in jewellery production in Kumasi-Ghana. Central to this study is also the role embossing method involving the use of dies and punches could enhance mass production of jewellery units.

2. Methodology

In this study qualitative, research design was employed. Strauss and Corbin as quoted by Marshal (2010) explain qualitative research as any kind of research that produces findings not arrived at by means of statistical procedures or other means of quantification. Under the qualitative research design, descriptive research and phenomenological study have been employed. Ndagi (1997) expatiates that descriptive research is concerned with the collection of data for the purposes of describing and interpreting existing conditions, prevailing

practices, beliefs, attitudes and on-going processes. Significantly, in the course of describing and interpreting the collected data, the central motive is to discover meaning. Descriptive research was therefore used to describe and interpret in detail the current techniques used in jewellery production by gold and silversmiths in Kumasi. Leedy and Ormrod (2010) opine that a phenomenological study attempts to understand people's perceptions, perspectives and understandings of a particular situation. In this study, phenomenological study was employed to investigate the understanding and perspectives of local gold and silversmiths regarding the uses of dies and punches in jewellery production, cost of precious metals such as silver, the techniques used for producing jewellery and their effects on pricing the finished products. Primary data were collected from practitioners of jewellery and jewellery works. Secondary data were also obtained from published books, unpublished thesis, articles and the World Wide Web.

The target population for this study was practicing jewellers or gold/silversmiths of Ghana. The area of study was the Ashanti region of Ghana. However, due to the vast nature of the region, the area of study was limited to Kumasi, the capital town of the Ashanti region, where most jewellery or goldsmiths or silversmith shops are found. Table 1.0 shows the population segmentation. The accessible population for the study was made up of selected jewellery shops in and around Ashanti New Town and Asafo.

Table 1.0: Population Segmentation

Segments in the population	Units in population
Area of study	Ashanti region
Accessible population	Selected gold/silversmiths from Ashanti New Town and Asafo, jewellery products and some selected tools.

Source: Fieldwork 2012

2.1 Sampling

Frankel and Wallen (1996) explain that sample in research study refers to any group from which information is obtained. Sampling is the process of selecting these groups or individuals. Owing to the nature of the study and population, purposive sampling method was used. The researcher handpicked practitioners from different jewellery or goldsmith shops from Ashanti New Town and Asafo areas of Kumasi. Frankel and Wallen again add that purposive sampling researchers do not study whoever is available but use their judgment to select a sample they believe based on prior information which will provide the data needed. This sampling technique was relevant to the study because of the fact that practicing gold and silversmiths are those who are on the field, and are going to benefit immensely from this study. This cohort was to confirm their production cost and prices and their appreciation of the uses of punches and dies. Twelve (12) jewellery shops in Kumasi were visited. Five (5) family owned jewellery shops were selected and the available jewellers interviewed. Seven (7) jewellery shops which were owned by individuals were also visited and owners interviewed. The works of these twelve shops were also carefully observed. Table 1 shows the distribution of jewellery shops visited.

Table 1: Sampled Jewellery Shops Visited

Groups interviewed	Frequency
Jewellery shops owned by families	5
Jewellery shops owned by individuals	7
Total sample size	12

Source: Fieldwork 2012

2.2 Instruments

The data collecting instruments used in this research were interview and observation. According to Tuckman (1994), observation gives a researcher an advantage of directness. This is because it makes it possible to study behaviour as it occurs and the researcher does not have to ask people the behaviour and actions of others. Observation was used to collect data whiles the jewellers were working or had finished working. An interview is a face to face interpersonal role situation in which an interviewer asks interviewees questions designed to elicit answers pertinent to the research. In this study, the interview as a tool was used because the education background of the jewellers or goldsmiths was uncertain. Interview was used to collect data concerning the understanding of the current techniques used in the production of jewellery at the shops or studios as well as the practitioners' knowledge about the uses of dies and punches in this respect.

The primary data collected were obtained from local goldsmiths and silversmiths using observation and interview. The study was conducted at the Asafo and Ashanti New Town in Kumasi in the Ashanti region. The collection of both primary and secondary data for this research spans from about one and half years. It began early in January 2012 when the researcher started to gather information from different sources such as published books, articles and unpublished books. Here, mention should be made of the internet which also served as an important source of information for this research.

By the middle of February 2013, final interview schedule and observational checklist for the study had

been printed out. Direct interviews were carried out in Asafo and Ashanti New Town in Kumasi because of the concentration of gold and silversmith shops in those areas. Both interview and observation were carried out extensively at the workshops and studios where sometimes work was in progress. This gave the researcher the opportunity to establish a cordial relationship with the respondents. The respondents included practicing goldsmiths and jewellers who have taught before. The interview was conducted in “Twi” which of course allowed free flow of ideas. Direct interviews were carried out at the respondent’s homes, workplaces and offices of respondents; and they provided useful ideas and information within the duration of thirty 30-40 minutes. Recording of the interviews were done in writing.

The researcher also made a keen observation on certain objects and behaviour which were deemed useful for the study. The tools of the jewellers such as punches and dies, their methods of production and the finished jewellery products were observed. In some cases, photographs were taken with a digital camera where allowed. This was done immediately after the interview.

3. Results and Discussion

The presentation and discussion of the results have been done under four main headings. These are:

- Cost of precious metals in Jewellery Production.
- Handling of orders by gold and silversmiths in Kumasi.
- Works and methods of production by gold and silversmiths in Kumasi.
- Gold and silversmiths knowledge of dies and punches in Kumasi.

3.1 Cost of Precious Metals and Jewellery Production

The rising cost of precious metals lately is impacting on jewellery production in Ghana. All respondents interviewed agree that the current prices of precious metals such as gold (Au) and silver (Ag) negatively affect the costing of jewellery production. Ten (10) of the respondents, representing fifty percent (50%) explained that the high cost of gold and silver do make customers feel cheated when the price of finished jewellery is mentioned to them. The customers were now resorting to ordering low carat gold jewellery such as nine (9) carat gold articles and sometimes they even ordered for brass jewellery articles as substitutes for gold wares. Figure 1 shows goldsmiths working on brass instead of gold.



Fig. 1: A goldsmith working on brass rings

This has made it difficult for customers to patronise jewellery products and has brought about a reduction in the number of customers who visit their jewellery shops. For example, formerly, it was possible to have ten (10) customers ordering for works but now, you hardly get two (2) customers a day. The respondents explained that only a few customers who were abreast with the current trends of prices of gold and silver did not complain but the rest complained that the prices of the works they ordered were expensive. They asked for a reduction in prices and if they did not get it, they left and did not return. All the respondents agreed that the cost of precious metals was also affecting the profit margins of goldsmiths.

Four (4) of the respondents representing (20%) believed that the type of work decided the costing and that if the weight of the work was heavy, it automatically made it cost high. Six (6) of the respondents representing (30%) argued that the difficulty to come by precious metals lately was contributing extensively to the expensive nature of jewellery made from precious metals. They added that their inability to produce and display works was due to inaccessibility and the high cost of raw materials. Agya Osei Frama who has worked in the jewellery business for sixty-five (65) years in a personal conversation stated that “it was easy to buy silver and gold coins in the early days for making jewellery but it is not the same today”. Again, in another personal conversation with Kwodwo Addo, he also added that formerly precious metals such as gold and silver could be bought from the banks but currently, there are no legal spots to purchase the materials for jewellery production.

3.2 Handling of Orders by Goldsmiths

Handling of orders from clients by goldsmiths did not vary so much. Ninety (90%) percent of the respondents

interviewed were of the view that they handled both small and large orders depending on the nature of the works that a client commissioned them to do. The works they produced were mainly done by using piercing and fabrication methods. However, they sometimes employed casting method as well. Ten percent (10%) of the respondents were of the view that they usually assessed the method which was suitable and used it to execute orders. Figures 2a and 2b show pierced jewellery works at a jeweller's shop.



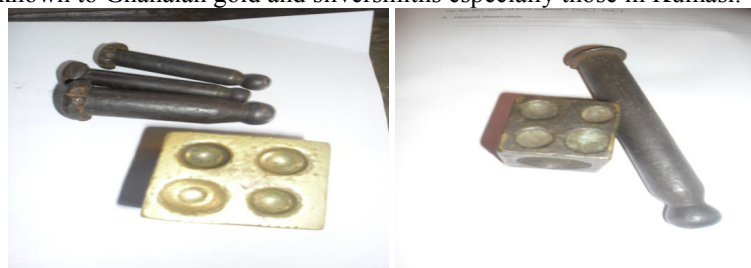
(a) (b)
Fig. 2a & 2b: Pierced jewellery works

3.3 Works and Methods of Production by Gold and Silversmiths

At all the goldsmith shops visited, it was observed that almost all jewellers employed the same methods in producing their works. These methods included casting, fabrication and piercing. Due to the similar methods of production, the jewellery pieces produced tended to be similar and included assorted rings, chains, pendants, and earrings as well as bracelets and anklets.

3.4 Gold and Silversmiths knowledge of Dies and Punches in Kumasi

Out of the twelve goldsmiths shops visited, doming blocks and doming punches were observed at eight (8) shops. However, all the twenty goldsmiths interviewed revealed that they have been using metal doming blocks and punches. Those who did not have metal doming punches and doming blocks at their shops explained that when it became necessary, they borrowed them from their friends or colleague goldsmiths and use them. Figure 3a and 3b shows metal punches and doming blocks found at the goldsmiths or jewellery shops. All the metal punches and doming blocks found at these goldsmiths shops were the same in design. They were all foreign made and could be used only for stamping letters and making domes. The doming punches were fabricated using steel and the doming blocks made of brass. The focus of this study, however, is the making of embossing dies and punches (die making) which is different from simple doming blocks and metal punches as shown in figures 3a and 3b that are well known to Ghanaian gold and silversmiths especially those in Kumasi.



(a) (b)
Fig. 3a & 3b: Samples of doming blocks and metal Punches used by the goldsmiths



(a) (b)
Fig. 4a & 4b: Letter Punches used by the Goldsmiths

Figure 4a and 4b show letter punches used by goldsmith in Kumasi. All the interviewees admitted that they only use doming blocks and metal punches to create “balls” and “half balls” which are used for pendants, earrings and chains. It should be added that there were stamped hollow jewellery works at some few workshops

visited but the goldsmiths admitted that they were imported and used as elements for jewellery sets. Figure 5a & 5b show the back and front parts of imported embossed elements

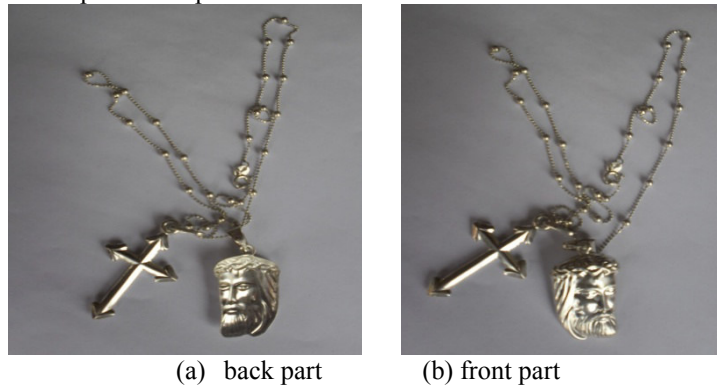


Fig. 5a & 5b back and front parts of imported embossed elements in silver

Table 2: Number of Years the Respondents have been in the Jewellery Business

Years	Frequency	Percentage
5-10	12	60%
15-20	0	0%
25-30	7	35%
35-40	0	0%
45-50	0	0%
55-60	0	0%
65-70	1	5%
Total	20	100%

Source: Fieldwork 2012

Table 2 shows the number of respondents interviewed and the number of years they have worked as gold/silversmiths. Their experience in the field of gold/silversmithing enabled the researcher elicit their understanding on dies and punches.

Table 3 Distribution of Responses from gold/silversmiths on the uses of Dies and Punches in Kumasi.

Items	Yes%	No%
I know about dies and punches	100%	0%
I have used dies and punches in jewellery production before	100%	0%
Dies and punches reduce cost of production and increase profit margin	100%	0%
Dies and punches can be used for making three dimensional works	90%	10%
Uses of dies and punches can help standardize weight of jewellery	90%	10%
I want to know how to fabricate my own dies and punches	100%	0%

Source: Fieldwork 2012

Table 3 shows gold and silversmiths knowledge about dies and punches. This gave the researcher insight into how they perceived dies and punches in the production of jewellery elements. The distributions on the number of years the respondents have been in the jewellery production show that majority of the practitioners have been in the jewellery business for a considerable number of years (See table 4.1). It was observed that majority of the practitioners are youthful. Sixty percent (60%) have had five to ten years (5-10) experience, thirty-five percent (35%) have had twenty-five to thirty years' experience and five (5%) had practiced over sixty-five (65) years.

If fifty percent (50%) of the goldsmiths lamented that because of the current high prices of precious metals makes customers feel cheated and because of this high patronage of jewellery made from precious metals is going down, majority of respondents agree that high cost of precious metals inevitably affects the price of finished jewellery. This is also making customers prefer purchasing cheap “fake jewellery” which is mostly imported into the country to those locally made jewellery with precious metals. That is why one of the goldsmiths stated that “Formerly, it was possible to have ten (10) customers ordering for works a day but now you hardly get two (2) customers a day”.

If thirty percent (30%) of the goldsmiths argue that it is difficult to obtain gold and silver to buy for their jewellery production, then it could be deduced that lack of specific legal places for goldsmiths to easily purchase gold and silver metals is also contributing to the high cost of jewellery production. If twenty percent (20%) of the respondents think that the type of work and its weight affect the pricing of the works, then goldsmiths could be made to understand that a change in the method of production such as embossing can reduce the heaviness of jewellery products and still maintain the integrity of the forms. However, if casting, fabrication

and piercing are the main methods used by goldsmiths for producing jewellery works, then it becomes obvious that dies and punches are not often used. They, however, admitted that they used punches and doming blocks for making works which involve the making of 'balls' and 'half balls' which are used for pendants, earrings and chains. Also, it could be said that if doming block and punches used by the goldsmiths are all imported as observed, then it could be established that it demonstrated limited creative abilities of the goldsmiths as it showed they were unable to use their own ideas to create dies to emboss jewellery elements for their jewellery production. They merely rely solely on already made ideas in the form of doming blocks and punches to create some of their jewellery.



Fig. 6: Showcased jewellery pieces at a shop

Though ninety percent (90%) of the goldsmiths claimed they were aware of dies and punches (as shown in table 4.2) and could be used for mass jewellery production; to create three-dimensional works; and could be used to standardise the weight of works in mass production, it was observed that the ones they referred to as dies and punches are actually doming blocks with their doming punches. Gold and silversmith were not familiar with dies and punches created with one's own symbols or images which could be used to emboss jewellery products with less weight and in big quantities in a short possible time. This in-house ability could eventually lead to maximisation of profits with minimum materials. Hence, all the goldsmiths interviewed indicated they would be glad to learn how they could fabricate their own dies and punches for jewellery production.

The ownership of imported doming blocks and metal punches by the goldsmiths buttressed the fact that 'balls' and 'semi-balls' which they used for pendants and earrings were the only major three-dimensional works produced using doming blocks and dome punches. This means that the goldsmiths had little knowledge about dies and punches fabrication and how they could be used to emboss designs of Ghanaian origin. Ninety percent (90%) of the respondents confirmed using mainly fabrication, piercing and casting methods for making the jewellery ordered by clients. This reflects why almost all the works they produced were either flat or heavy in nature. Figure 6 shows samples of jewellery for sale at a shop. Three main reasons account for the high cost of jewellery made from precious metals according to the goldsmiths and silversmiths. First, the high cost of raw material such as gold and silver; second, lack of designated legal posts for selling gold and silver and third, method of production which results in heavy jewellery pieces.

4. Conclusions

Goldsmiths were not able to explore their own ideas using embossing methods because they relied solely on imported dome blocks and metal punches which could only produce domes and half dome forms. Steel and brass are the metals used for the manufacture of the existing dies and punches found in workshops with some having lasted for over thirty years. Jewellers mostly used dies and punches for making domes and half dome elements for onward use as pendant, earrings and necklace. Most of the jewellers learned the jewellery profession through apprenticeship system. Lack of designated legal centres for goldsmiths to purchase raw materials such as gold and silver also contributes to the high prices of jewellery. Goldsmiths used similar imported doming blocks and punches and therefore tended to have the same designs. The jewellery profession is still serving as a source of employment for a lot of people in Kumasi. This is evident in the data collected which shows that majority of the respondents (sixty percent) have spent between five and ten years in the trade. It means that the jewellery profession is still attractive to people. Since the learning of the profession is based on the traditional family apprenticeship system, elders pass on the knowledge to the young family members and this in a way perpetuates the jewellery practice in the family. This is the reason accounting for the numerous goldsmiths and silversmiths learning the trade in the apprenticeship system.

Directly or indirectly, all respondents agree that the cost of precious material (metals) inevitably affect the price of jewellery. Goldsmiths in practice are aware that the quantity of material one uses for a work determines its cost. This in effect also affects patronage of jewellery wares. For the respondents, it is only when the material is cheap that precious jewellery products can also become affordable. Makers of jewellery do not have control over the market cost of gold, silver and other precious metals. However, they complained of low

patronage because they have not taken full advantage of modern methodologies such as the use of dies and punches which can help them produce jewellery of high quality and form in less weight which will command lower prices and thereby attract more customers. The jewellery business thrives when jewellers produce wares of high quality at prices that meet the needs of customers in terms of affordability.

Execution of orders has also followed a tradition. Both large orders and small orders were worked on using piercing, casting or fabrication methods. The result is that their works were flat and light weight or in the round and heavy in weight. Though the goldsmiths claimed to have in-depth knowledge about the uses and benefits of dies and punches such as using less material to produce three-dimensional works; standardising weight of jewellery; reducing cost of production and increasing profit margin, they did not use them because most of them did not have technical know-how to design and fabricate their own dies and punches for production of jewellery of their own designs.

References

1. Rajput R. K. (2007) A Textbook of Manufacturing Technology: Manufacturing processes. Firewall Media
2. Codina, C. (2007) Goldsmithing and Silver Work: Jewellery, Vessels and Ornaments. Sterling. Page 49
3. Bawa, H. S. (2004) Manufacturing Processes – L, McGraw – Hill Education, page 120.
4. Leedy, P. D. and Ormrod, J. E (2010). Practical Research, Planning and Design. (9th Edition). Pearson Education, Inc., New York.
5. Frankel, J. R. and Wallen, N. E. (1994) How to Design and Evaluate Research in Education (3rd Edition) McGraw Hill inc. N.Y pages 13, 19 & 101
6. Marshall C. (2010) A Research Design for Studio-Based Research in Art. Teaching Artists Journal 8(2) Pages 77-87
7. Ndaji J. O. (1997) Essentials of Research Methodology for Nigerian Educators. Ibadan University Press. Pages 86-99
7. Tuckman, B. W. (1994) Conducting Educational Research. Harcourt Brace and Company. Page 366.

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