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Highlights

- New Interpretation of Plate
- Student Teachers Interaction
- Jewelry Education in Ghana
- A Detailed Study of Settler

Discovering Thoughts, Inventing Future

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New Interpretation of Plate Structure Theory Optimization Design Training Program

By Wen Bo & Wen Tian Yang
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Abstract- The world competitive sports games, showing a very competitive situation, the winner will have to participate in the support behind is a high level of theory and technology, more discipline involved in training to improve the effect of training quality, plate training theory involves the track and field, swimming weightlifting project, through access to relevant data, USES the analogy analysis method; According to the research and analysis results, there are still differences in the plate training structure of jumping project training, and there are obvious gaps in the application of training theory and practice. Therefore, the training plan is not specific and specific. The research conclusion of this paper argues that the theory of sports training needs to be updated and improved to meet the needs of the intensity of modern sports competition. Multidisciplinary evaluation data and multidimensional structure are used to formulate medium - and long-term training plans to guide jumping training for athletes to achieve excellent results.

Keywords: *professional athletes, track and field sports, triple jump, pole vault, competitive status.*

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New Interpretation of Plate Structure Theory Optimization Design Training Program

Wen Bo[α] & Wen Tian Yang[σ]

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I. This Paper

In the process of modern sports training, systematic control, biochemical detection and scientific and efficient sports training have become an effective way to train professional athletes' high-level competitive ability and optimal competitive state, and are a practical problem concerned by scientific research on sports training of competitive sports. Training scholar Ver. Ehesehanskii) proposed a new theory of "periodic training", that is, the training mode known as "plate". From the "general training and specific training" and "training volume and training intensity" point of the process of interpreting training for different types of sports from the aspects of the quality and ability of concrete to training arrangement, based on the characteristics of high level athletes training "concentrated load effect" training method is proposed, which is a key factor for athletes special performance and relatively weak quality concentrated in the form of plates inserted into the training cycle, the total load exercise under the condition of relatively constant, increase the quality and ability of sports training load. Through its centralized training and priority development, the achievement of special sports can be improved. The theoretical model of "plate" training is based on the adaptation theory of human biology, which interprets the process of sports training as an adaptation cycle. The training process is divided into three stages: the first stage is the special basic training stage. The main task of this stage is to develop the athletes' potential for special competitions. The second stage is a special training stage. The main task of this stage is to enable athletes to make full use of their improved sports potential and show it by gradually increasing the intensity of the competition. The third stage is the main competition stage, which is the end of an adaptive cycle. The main task of this stage is to maximize the performance of the athletes' improved sports potential in a typical competition.

Plate training focuses on selectively identifying a few qualities for intensive training within 3-4 weeks. To enable high-level athletes to receive a single or two relatively large training stimuli in a relatively concentrated time, and check the training effect through physical quality, competition performance and physiological, biochemical and medical indicators in each training section. In this way, the three or four sections constitute the training preparation period. In the annual training cycle, different sports training loads and objectives are converted. In the theory of plate mode training, the preparatory period should also be arranged to participate in the competition, and the basic training should also be arranged in the competition period. This basis is professional athlete is in high level athletic training, the stimulation of training already cannot achieve to athlete high intensity requirement and excitement point, must pass attend a competition to come true high intensity changes. "Plate" the essence of the theory of training is to make the cycle training theories in high level athletes training in a variety of quality under parallel development is not, as the key to minimize negative factors, through one by one "the organic combination of plate structure, centrally developed the athletes' special ability, solved in a" plate structure ", "plate" and "plate", different load characteristics and load size between the quality and ability of different organic ground recovery and cohesion. "Plate" training mode emphasizes the special training, so training "plate structure" theory for a long time to maintain a high level player continuous competition ability will become the important guiding

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role of competitive projects, buoyed by the strength of the body, to obtain the function of competitive state reserves, special means of training and exercise load can effectively improve the athletes' special performance, can make the athlete body in shape, structure and function to hold special direction, the run-up to professional athletes in the competition ability of competitive state. For the development of the competitive state of professional athletes or athletic ability, on the basis of biology to acquire the basis, solve the problem of improving special sport technology, the characteristics of the future training of scientific development, effective support to the formation of competitive stage and diversified characteristics, the regularity of formation of professional athletes competitive state, the training mode of sports training this is conditioned by many factors influence of track and field sports, to a high degree of coaches through training stage and different training phases, training means and different load exercise, can more easily control into the general law in sports training. As the athletics sports limit peak, the competition between the high level athletes differences often performance is only one percent "seconds" or "one centimeter", this special ability for professional athletes, must be accurate planning, design and training of monitoring in sports training, extensive training theory it is difficult to guide the high level athletes in training. The theory of plate training is that there are some gaps in these aspects;

The lack of necessary energy reserve training in the plate training plan is not due to the placement of certain required qualities, but the inability to form a large period wavy curve. What is concerned is not the excess recovery process of athletes, but the excessive focus on special achievements and big prize competitions. The monotonous disconnection curve formed by the quality of the training and development unit of the plate does not grow the overall medium - and long-term training plan content of the chain, and it is unable to link and develop another quality in detail. It repeatedly lacks the necessary link process. If the link is re-linked, the phenomenon of repeated docking will occur, which reduces the over-recovery process of further improvement.

Plate training without full preparation, if during the period of preparation training prepare adequately for the athletes, sustainability is not systematic, metabolism will make energy reserves are missing, really come to the race will generate power is insufficient, affect the athletic state, frequent games in a row, consume large amounts of energy to deal with the winter and summer games. Actually plate structure is not a small cycle for game plan, is clear for performance and local design, plate structure is not the overall layout, do not have long-term overall design, lack of development of the concept of comprehensive quality, design do not have enough time for short, if is the elder, big intensity caused by injury, athletes sporting life will retire ahead of schedule because of the heavy injury.

Plate structure priority to the development of training which training content plate, should be fully on the basis of biochemical data, not with coaches feeling experience or training plan, and scientific training plan, based on the scientific technology and methods, such as a muscle cell fission, that fine muscle cell fission to what degree, scientific training, selection of plate structure after training, the training of the plates now meticulous and complete enough, can't reflect fine accuracy, diversified, three-dimensional multifaceted structure characteristics of thinking. For example, aerobic training is used to strengthen the ability of anaerobic projects, plateau hypoxia training is used to enhance the endurance of aerobic projects, and biochemical indicators used as the theoretical basis for plate training will be more objective and persuasive. The principle of the objective reality of the real, there are a lot of movement to be meticulous research, such as complex formation law of sandstrom, high level technology development speed, improve the power law, accumulation change quality, the low level to high level factors, quality training structure, many training law phenomenon are outside the cycle training principles.

In the face of training practice, it should be refined to refer to the biochemical data of athletes, physiological functions and the reference data of various bodily functions, such as blood lactic acid volume, oxygen debt capacity, muscle hemoglobin quantity and muscle cell mitochondria. If there are high levels of energy reserves plate training plan, now coaches to use good biological monitoring measures, and ensure athletes to achieve a high level of long-term exercise load capacity, monitoring and control, the implementation of good sports load, improve the level of professional core capacity, a variety of strength quality is different, is different solutions to improve.

Plate can't wave curve bridge for medium and long-term plan, training structure is divided into strength cycle, density and strength cycle, plate structure provides training coaches often change program content, and free transform the chances of training goals, links are not considerate not closely, lack of considering the excess resume link plate structure, strengthen to the defects of continuous intensive training.

Lack of physiological and biochemical experimental data that can reflect the various functions of athletes' bodies. During the period of cell fission, muscle tissue protein declines, cell growth cycle is accelerated, and cell growth cycle is destroyed. Incomplete physical quality simply pursues competitive status, which weakens the link of a certain quality and leads to premature injury. When the mitochondrial

membrane function was fatigue, the generation of oxygen free radicals increased, the peroxidation level of membrane lipid increased, and the phospholipid content and membrane fluidity decreased. The destruction of mitochondrial membrane structure and function is an important reason for the decrease of energy generation and sports fatigue. In the state of exhaustion, the normal structure and function of mitochondria are seriously damaged, which can cause many factors to induce apoptosis. Mitochondria are the control center of cell apoptosis, and there is a very close relationship between the changes of their structure and function and apoptosis. The intensity of sports training will have different effects on human mitochondria.

II. Optimize the Structure of Training Plan

To further examine the practical effect of plate structure training, coaches should accurately design and grasp the maximum training efficiency. For the purpose of plate structure training, we should not rush for the purpose of competitive performance. There are many health factors in the training. If we fail to fully understand it, we will have to follow the plate structure training mode in all sports and at all levels, at the expense of the athletes' sports life. After the end of a plate training period, there is a lack of necessary continuity, and there is a new plate training plan. Next, if there is a lack of scientific and reasonable basis for the selection of plate training, it is relatively imprecise and specific. Attention should be paid to the following;

Plate training is mainly designed for high-level athletes. Priority should be given to the training plates that have an impact on and play a key role in improving athletes' special performance, and then to the training plates that are relatively weak in athletes' quality. Training plan plates, change a plate, plate to connect the next training should be built-in main continuous nature, especially athletes mainly ability quality, not stagnation, should consider the development of special ability of training means, sports load properties, physiological load of exercise load change basically consistent, stable running from training the mainstream of the fault situation, focus on comprehensive physical quality foundation.

The total load and amount of exercise during the training shall not fluctuate abruptly due to the change of training plate, unless the athletes suffer from injuries or heavy and large competitions. The intensive training cycle of the training plate for athletes should not exceed 4 weeks. The training recovery plate should be relatively independent and should not be mixed in the training plate for improving the quality of athletes. Coaches are ready for the competition. Before the competition in 2-3 weeks, there should be a technical training content section to solve the technical problems of athletes, close to the intensity of the competition, check the technical problems of athletes, the process of the technical training section has the characteristics of integration, adjustment and recovery, and then improve the competitive state.

In the training plan for athletes of long jump, triple jump, high jump and pole vault, there are two parts to formulate the content of plate structure: focus on improving the special quality and compatible auxiliary quality. For example, to develop the maximum strength of athletes, it is necessary to combine the fast jumping training to improve the quality of muscle speed and strength. For example, to develop athletes' special jumping skills, it is necessary to complete technical movements in a fast rhythm, combined with fast strength training. In order to improve the running speed training of athletes, it is necessary to combine sprinting speed training to improve the lactate free ability level. For example, to improve athletes' muscle explosive power, it is necessary to combine special strength quality and aerobic rehabilitation training. In order to improve the strength and endurance of athletes, glycolysis level should be combined to improve the non-oxidative endurance.

In the long jump, triple jump, high jump, pole vault athletes competitive state in the process of the formation, not because the athlete special features affect the competitive state, but due to the short, limiting the athletes special features of the play, very important is to strengthen the training of the ability quality, short, plate special content and compatibility in training quality to improve the level of competitive ability has very big effect. In-depth understanding of the details of the training law, the internal relationship between the quality, sports characteristics, the role of each plate structure in the development of athletes' ability, the role of improving performance, the weight of the sports load on the role of the body, these are related to the improvement of athletes' physical quality level. Different special sports loads interact with each other and have different effects on the body. The results generated between the effects are also regular and can be followed. Jumping events of track and field plate structure training mission, focus on the development of special quality, to be compatible with other qualities, have different special characteristics, such as the development of maximum strength, must be combined with explosive force training, special technical training, have no ability to lactic acid, such as development to combine fast strength training and aerobic training, such as the development of technical ability training to combine rapid run ability training. For example, after the development of the maximum strength training section lasts for 3 weeks, there should be a small recovery cycle, a gap micro cycle, and some aerobic exercises to

buffer the transition to the next training. The next step is to choose fast strength training to enhance the obvious effect of specific ability. According to the laws of the human body muscle cell fission, the growth of muscle cells, mature degradation period, medium weight training for athletes body recovery time need at least 24 hours, the maximum load training of athletes body recovery time needs at least 48 hours, the limit load of athletes training the body recovery time need at least 72 hours, whether it's ability to stay in motion, or improve the development of sports ability is need enough time to recover, but, at present professional athletes didn't make full use of recovery time, most of the training is in the condition of fatigue, often under the three times a day for training, The means to restore the process are increasingly necessary.

Pursue multidimensional structure characteristics of the plate structure of training, provide the basis of plate training plan, the largest value scientific rationalization, comprehensive participation training plan using a variety of disciplines, such as intensive training top curve (including the results of the competition), end of wave crest and wave difference do not issue a visa more than 4 weeks, not less than 7 days, big density training day interval should be in 3 days to recover completely, this respect, the regularities of exercise training can reduce the blindness of training guidance. Adhere to the principle of training means diversification, although in each task and content includes development training plate 1-2 special quality and compatible with auxiliary quality, this does not mean that the training methods of the rationality of simplified single, make use of training means diversification in the training session, it is advantageous to the comprehensive development of athletes special physical quality, to improve special performance. Zhu jianhua, the former high jump world record holder, has a successful training practice example.

Professional athletes in training load a fatigue, restore to improve the process and the time is different, if do not have enough time to give each quality and capability adaptability to improve and maintain, some quality and ability is lost or fall, especially for jumping special ability has the ability to support this is disadvantage to improve the ability of athletes. This requires more scientific training arrangements for coaches. Due to the complexity of the interaction of various abilities, it is difficult to apply the study of human sports biology to improve the accuracy and subtlety of adaptability of each training unit and training week for different events, athletes' qualities and abilities. Training cycle and "plate structure theory, is based on outstanding development of core competence, the training content is in accordance with the special ability to play a central role adaptability to schedule, quality and ability needed by each class session key stimuli and continuous stimulation depth, in order to realize the professional athletes beyond the original adaptive fitness levels, to expect to achieve higher level to adapt to the physical stamina training. At the same time in improving the quality and ability of the practice interlaced with some compatibility can play a regulatory and auxiliary role. In terms of professional athletes the principle of adaptation, the quality and ability of a single of the flexibility of the time, compared to the cycle training preparation more emphasis on the quality and ability of parallel development is relatively easy to control, at the same time jump special core competence on the body caused by fatigue is effective, less effect on the overall training fatigue.

During the preparation period, the development speed training mainly focuses on 150-200 meters distance running, with the maximum development speed of moderate intensity running and the proportion of high-intensity running less than 100 meters distance. Develop leg leg strength in preparation period, undertake core strength training first, because athlete jumps motive force to come from lumbar back abdominal muscle.

III. Conclusion

To improve athletes' performance in competition, it is necessary to update and improve the theoretical thinking of training, and to study the core essence of sports training, so as to conform to the new trend of the development of competitive sports in the modern world. The training theory has become an important guiding role for the long-term maintenance of the continuous competition ability of high-level athletes in competitive events. Analysis and study movement systems have different effects on training, to applicable range, control theory, high quality of the training phase, the training content to make buoyed by the strength of the body, to obtain the function of competitive state reserves, special training means and exercise load can effectively improve the athletes' sport achievement, therefore, should weaken run-up professional athletes in the competition ability of competitive state, beneficial to the development or professional athletes competitive state competitive ability training, for enrichment, out on the basis of solve the problem of improve the level of sport technology, in line with the training of scientific development, development need the support of physiology theory in biology, To form diversified characteristics of competitive state, explore the law of the formation of competitive state of professional athletes, enrich and develop the training theory needs the innovation of training thoughts.

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Can Manifest Destiny Justify the Ruckus on the Klamath River Basin? A Detailed Study of Settler Colonialism on Klamath Tribes

By Anjitha Gopi
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Abstract- The headlines of contemporary news articles render the following “Fish Blood in their veins, fewer Salmon in their river,” “Removal of Klamath Dams would be the largest River Restoration in U S History,”, and “Will the Klamath River Salmon survive after the dams are gone?”.A closer look into these heated discussions helps us understand that all is not well on the Klamath River Basin. Although dams and low salmon runs feature among the current debates, water allocation remains the crux of the issue. These issuesmake us question the why and how of water distribution among the populace that sustains on the Klamath Basin and how power plays an important role in water allocation. The Klamath River, the life blood of indigenous communities is virtually connected to their identity, culture, spirituality and thereby sovereignty. This research paper probes into this issue on the Klamath Basin over land and water resources and help us define how changing patterns of Settler Colonialism has invaded Tribal Sovereignty in the twentieth century.

Keywords: *klamath river, settler colonialism, tribal sovereignty, salmon kills, klamath dams.*

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I. Introduction

Gazing at the Klamath river basin, where the river meets the ocean, one cannot fathom the ruckus that has changed the face of the river. As the river merges into the ocean one feels the balance of life, although temporarily as the headlines of contemporary news articles have a different story to render. "Fish Blood in their veins, fewer Salmon in their river,", "Removal of Klamath Dams would be the largest River Restoration in U S History,"(KQED news), and "Will the Klamath River Salmon survive after the dams are gone?" (KQED archive). These present-day discourse about the violence and injustices on the Klamath River elicits that the balance is a fragment of imagination. Perhaps a century of westward expansion and maneuvering of resources in the name of progress has decimated the Klamath River- the epicenter of tribes living on the Klamath watershed. While Manifest Destiny and Capitalism have paved destructive ways to the Klamath, the tribes are trying to resist this incursion on their land something that is not just a part of their ecosystem, but also inevitable to their spirituality and culture. This act of revitalizing their land and water resources is resistance to settler invasion on the one hand and a way to assert their inherent sovereignty on the other.

A closer look into these heated debates helps us understand that although dams and low salmon runs feature among the current discussions, water allocation remains the crux of the issue. The building of dams and resultant lower salmon counts makes us question the why and how of water distribution among the populace that sustain on the Klamath Basin and how power plays a major role in water allocation. For the tribes, the Klamath Basin conflict characterizes something beyond water and salmon, "perhaps more than any other issue, fishing rights disputes epitomize the tribes' struggle to revive traditional culture, treaty rights, and sovereignty" (Wilkinson 153). The Klamath River is virtually connected to their identity, culture, spirituality and thereby dominance. Thus, probing into this issue on the Klamath Basin over land and water resources help us define how changing patterns of Settler Colonialism has invaded Tribal Sovereignty in the twentieth century.

The third largest watershed in the western United States, the Klamath River originates in eastern Oregon, defies boundaries and runs through five counties thus giving life to four federally recognized tribes. Eight tributaries of the Klamath feed the "wild lands and human enterprise" (May,1). While the Upper Klamath is the traditional homeland of Klamath, Modoc and Yahoo skin peoples, the mid and lower Klamath serves as an ancestral land of the Karuk, Hupa and Yurok people respectively (May, 1-3). Over the years, the vast marshlands and mountains shapes human life on the basin is shaped and in the words of Stephen Most, "In the Klamath Basin, geography is destiny" (ix). But the nineteenth century saw the arrival of white settlers who saw these as potential farmlands and this altered the indigenous lives and natural processes. These colonizers who came with a spear to own this land reshaped nature itself and Klamath eventually became a product of westward expansion and American colonialism.

The Klamath Basin is fragmented into layers of contested history. With abundant resources and native people on the basin, the white settlers felt the need to conquer both. Confining the Yurok and other tribes onto the Klamath Indian Reservation in 1855 was the solution

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to the "Indian Problem" (Huntsinger 169). The late 1800s was the beginning of settler colonialism that threatened the sovereignty of the tribes. In the words of Whyte, the indigenous community of Klamath was "standing in the way of their achievement of aspiration" (158), and the reservation marked the inception of systematic infliction incurred by the white settlers on the tribes. The new reservation system cut off access sites for gathering and spiritual practice and greatly reduced access to wild game and fish (Huntsinger 167). A Hoopa Valley Reservation was formed in 1864,and President Harrison ordered the incorporation of a twenty mile stretch between the reservations to form the Hoopa Valley Reservation Extension (Huntsinger 169). A Dawes General Allotment Act sprung up with the failure of reservation to assimilate natives into mainstream society. It authorized the allotment of Original Klamath River Indian Reservation in 1892 to break up the kinship system of indigenous peoples and give them individual land bases. While "all unallotted properties would be returned to the public domain and disposed of to settlers" (Huntsinger 170). This General Allotment Act led to land and resource dispossession from native hands to that of settlers. This pattern of land grabbing and exploitation of resources formed the microcosm of the larger story of Settler Colonialism.

According to Kyle Whyte's definition

"Settler colonialism refers to the complex process in which at least one society seeks to move permanently on to the terrestrial, aquatic and aerial places lived by one or more societies which already derive economic vitality, cultural flourishing and political determination from the relationships they have established with plants, animals, physical entities, and ecosystems of those places" (158).

The story of Klamath Basin complies with Whyte's definition of Settler Colonialism accurately. The white settlers slowly encroached into native lands, gradually eliminating the indigenous peoples and their ecosystem through various degrees of making policies. With the Dawes Allotment Act, a considerable amount of land shifted from native hands into that of the white settlers. But, the indigenous stewardship of land was in constant danger with the changing policies of the United States Federal Government, who "sought to capitalize on the region's rich farmlands and abundant timber" (May, 3). With the advent of the twentieth century, this greed to build capital out of land and resources manifested itself in the selling of federally owned lands to farmers for agricultural and construction of several dams across the Klamath River to provide irrigation for farmers. The 1902 Reclamation Act, managed by the Bureau of Reclamation built several dams for the benefit of farmers, ignoring the native's sustenance and spiritual needs. "The original plan of the Reclamation Act was simple. Federally owned land to be irrigated by the project were sold to farmers, the proceeds deposited in a trust fund dedicated to financing the initial irrigation works and later the reclamation of additional lands" (Doremus 48).

By 1960, under the Klamath Project, four deadly dams were built on the river that diverted over "1.3acre-feet of water to irrigate a quarter million acres in both Oregon and California" (Doremus 50). These dams not only narrowed the flow of water, but it also destroyed the cycle of salmon prohibiting its free movement. In the years that followed, war veterans received priority for new homesteads, and hydrological development for agriculture increased. The Termination Act of 1953, a federal policy that supposedly solved the "Indian problem" culminated with the decimation of tribal governance of remaining land and water resources. Thus, the ecology of Klamath basin and autonomy of the Klamath people was in a continuous mode of exigency (May 3). The effects of American expansion in terms of excessive mining, logging ,and agriculture by the mid-1990s saw its aftermath when the Klamath Coho salmon featured in the list of Endangered Species Act. This onward colonial expansion was further precipitated by 2001 drought in eastern Oregon which drew large gallons of water from the Klamath for irrigation and years of expansion, exploitation,and misuse of resource led to the historic fish kills of 2002, which left thousands of salmon corpses floating on the riverbanks.

American exploitation fragmented the Klamath river basin, and a closer look at it helps us understand the pattern of Settler colonialism that has invaded native space and autonomy. Klamath Basin has witnessed a clash of cultures over time, as Gordon Bettles' writes in the foreword of *Salmon is Everything: Community Based Theatre in the Klamath Watershed*. The variegated perspective of the white settlers and that of the Indigenous population of Klamath goes back to their creation stories. Bettles writes, "Transposed onto the New World, the newcomer's creation story unleashed a harmful dynamic between people and land, and one that was very different from the story that had sustained the tribes for thousands of years" (xiii). The newcomer's worldview informed that the land was a "resource, a commodity harnessed for the good of mankind, the newcomers fell into a pattern of exploitation without self-regulation." (xiii). The tribes of the watershed, on the other hand, believe that the Creator has provided these resources to use them in a sustainable manner.

It is this variegated perspective of the settler that invaded the sovereignty of tribes from enclosing Klamath peoples to reservations, capitalizing lands through allotment policies, building deadly dams on the river for irrigating agricultural lands and therebydestroying the food of Klamath peoples - the Salmons. Salmon is the largest martyrs of Settler Colonialism. The historic fish kills of 2002 was a tragedy

that decimated the lives of Klamath people. The Salmon kills was not just an environmental disaster, but a cultural and spiritual disaster for the indigenous peoples of Klamath. Salmon is the epicenter of their existence - subsistence and spiritual. Indeed, "salmon is the totemic spirit of the region and key to its history" (Most 69). Sue Masten, former tribal chair of the Yurok Tribe and president of the National Congress of American Indians at the turn of the 21st century declared: "We are salmon people. We couldn't let anyone take that from us" (Wilkinson 150). A concise version of the creation story from Stephen Most's *River of Renewal: Myth and History in the Klamath Basin* rendered by Geneva Mattz goes as follows,

At the beginning of time, the Creator came to the mouth of the Klamath. He stood on the beach and thought: "This is a great river. I want to leave my children here. But there's nothing for them to eat." So, the Creator called to the spirit of the river, Pulekukwerek.... Pulekukwerek answered, "I can feed them. I can send fish" ... Greatest of all, Nepewo entered the river each fall, leading the salmon people. Then the river spirit made human people. (69).

These origin storieshelp us understand how fundamental salmon to the existence and identity of the Klamath peoples is. Western ideologies can never comprehend the intrinsic connection between salmon and the indigenous communities. For the white settlers, water in general and salmon, in particular is nothing more than modes of capitalization, but for the Klamath peoples, the salmon connects every facet of their lives. For them,

Catching the first salmon of the season had significance beyond the return of a chief food source. Traditional Yuroks understood that salmon are somehow responsible for the renewal of life on land as well as in the river. Salmon bring nitrogen from the ocean to the forest floor via the intestines of mammals that eat them. But for Yuroks, it was and remains a spiritual reality that their ceremonies are part of the annual cycle of life within their world. (Most, 2006: 73)

Therefore, salmon suggests a balance between human beings and nature and this balance disrupts with the incursion of settler expansion. The settlers, ignorant of the traditional way of living designed indigenous lives according to their growing needs, condemning their sovereignty that predates even the formation of the United States.

In the Klamath River Basin, the biggest question is who holds authority over resource and its allocation, the reasons for discourse on sovereignty. To understand the United States' definition of tribal sovereignty, one must look into the Marshall Trilogy, a Supreme Court case (1823- 31). In one of three lawsuits: *Cherokee vs.Georgia,* Marshall defined natives as "domestic dependent nations." He offered an analogy to this relationship as that of "a ward to its Guardian" (Fixico 382). But on the Klamath, the guardian has always played the role of a "conqueror" as mostly the solution to Indian problem resulted in the violation of their inherent sovereignty.

Despite this, the Klamath peoples have always opposed this invasion by exercising self-autonomy. The fish wars of 1978 remain a crucial moment of Tribal Sovereignty. During the 1960s, with dipping salmon runs, the sports fishermen and offshore commercial fishing joined hands together to put a restraint on the native people, even though the former was at fault. New regulation in BIA set time for indigenouspeople, irrespective of tides and federal coast guards were put to watch the native fishermen. Thus, from the late 1960s, "a miniature naval battle" on the estuary of the Klamath River prevailed where Indians tried to fight back the federal invasion using unusual gill nets or no gill nets at all. Raymond Mattz, a Yurok fisherman, was a prominent figure during protest fishing, when one day he was "tired of being chased all the time" and decided to go to jail. Stephen Most jot down the incident as a turning point of exercising sovereignty on Klamath.

On September 24, 1969, Raymond and a group of friends had spent a typical day fishing. Raymond recalls:

It was before dark ,and we were sitting around the fire. We went up to look for our nets and it [sic] was gone. And I said "Well, I thought I saw the game wardens go up earlier. I'm going to ride up the river and see if they're up there." And they were up around the corner from where we were at, you know? I went and asked everybody, "Who wants to claim their nets?" Because you could go to jail, and we didn't want to go to jail.So, Raymond claimed all five nets. This time he went to theprison andthe courthouse. (Most 106)

Instead of paying a fine of one dollar, Raymond proclaimed that he wanted his fishing rights back. This incident turned to Supreme Court Case*Mattz vs. Arnett* which ruled in favor of the Yurok fishing rights. Thus, "Salmon wars were an act within the larger drama" (Most 110-121). The Supreme Court verdict marked the beginning of native activism in Klamath directed towards Tribal Sovereignty with the Self Determination Act of 1975 passed.

The unprecedented fish kills of 2002 rang the urgent need to condemn the conquest of settle state. Years of perseverance of tribal and fishing organizations led to the signing of two agreements on February 10th 2010 which heralded the removal of four major dams. Although the stakeholders have signed the Klamath Basin Restoration Agreement and Klamath Hydroelectric Settlement Agreement, the dam removals are bound only by 2020 as it requires federal funding to take them down. While this accounts as a considerable milestone of Tribal Sovereignty, some still argue that the removal does not "guarantee adequate water for salmon during droughts" (May 10). Dam removal is just one side of

mending and poor water quality due to excessive mining and logging is still an issue that the tribes face as a result of which salmons don't thrive. Klamath people are still struggling with low annual return of salmons and have to pay for the deeds of the colonizers. The Yurok has spent the last two decades restoring the fish and wildlife habitat on the Klamath Basin. Yurok is governing these issues with Fisheries, Watershed Restoration and Environmental Protection, thereby exercising their sovereign powers against the invasion of settler colonialism.

But, water allocation under federal control is a supreme challenge to the sovereignty of the tribes. Even though the federal government has reached a consensus about dismantling the dams, water allocation is a recurrent contention. According to Cordalis, a tribal member, "The problem is they don't manage the river for fish. They manage it for agriculture" (Bland).The allocation of water has always been a biased practice. The contemporary counterparts of settlers, the farmers and ranchers' concerns weigh more than any natives. Dam construction was the beginning, but with the drought in 2001agriculture demanded more water from the river. As the farmers revolted for more water through a movement called Bucket Brigade otherwise known as the farmer's civil disobedience movement, water allocation for irrigation purposes reached maximum. Thefederal government decided to favor the farmers even though scientific research had shown low water levels would result in salmon kills. This move by the government was an attempt to win the elections at that point in time (May, ix). As we delve deeper into the issue, water allocation is power- laden and political and infringes tribal sovereignty, the tribe's ability to govern their resources.

However, adding up to the conflict of exercising sovereignty is the contemporary illegal cultivation of marijuana on the Basin that demands the diversion of large gallons of water. Barely recovering from the fish kills of 2002, another challenge before the Klamath people is the draining water from the streams for marijuana cultivation and contamination of resources through chemical releases from abandoned sites. Marijuana cultivation on the basin is another form of Indian removal, as it deprives them fromthe resources that sustain them. Now, Klamath people are fighting against this form of invasion. More recently, The New York Times published a news article on March 8, 2018, titled "The Next Standing Rock? A Pipeline Battle Looms in Oregon" which talks about a proposed 229 miles long pipeline which is to pass underneath the Klamath River. The pipeline proposal poses more risks than the dams and will put its watershed, forests, cultures, bay, homes, climate and future in danger. For the pipeline to get built the Federal Energy Regulatory Commission must decide in public interest ,and it has already turned down twice. But with the Trump administration speeding up permission of natural gas pipeline, things are worrisome for the Klamath people, contrary to the trustee responsibilities of the federal government to the tribes.

These power- laden decisions of resource allocation and policies are understood betterwith Iris Marion Young's concept in "Communication and the Other: Beyond Deliberative Democracy" which she calls as "deliberative democracy" where only majority voices are taken into considerations to achieve a common ground of decision making. In the Klamath Basin as well, federal government works in favor of the farmers in comparison to that of natives simply because the former constitutes the descendants of American pioneers, hence a majority voice. Thus, Klamath Basin remains an analogy of the mechanism of exclusion that settler colonialism has played throughout.

These issues in the Klamath River Basin is a product of settler colonialism, where the "singular goal of the settler state relative to Indigenous peoples is the elimination of the Native to gain access to land" (Ortiz 48). The arguments laid out above helps us understand that settler colonialism is ongoing in the everyday lives of the tribes and transgresses sovereignty at every point. Voices from the Klamath River basin form a powerful form of resistance to centuries of injustice and violence. It stands as a microcosm of indigenous struggle against the Euro American ideas of capitalism. The story of the Klamath basin privileges the marginalized voices and stands as an example of Iris Marion Young's "communicative democracy,"where every opinion matter. Such stories when pushed into the contemporary discourse helps in asserting tribal sovereignty that would heal the historical trauma of sufferings. More than terms like tribal sovereignty or settler colonialism, we are left with questions about humanity like why do decimate the very force that feeds us, the Klamath River?

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Summative E-Examination for High Stake Assessment in Higher Education: A Case of Undergraduate Students at the Kwame Nkrumah University of Science and Technology

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Abstract- The previous era witnessed larger student numbers, reduced resources and increasing use of digital technologies which have led to the increased use of multiple-choice question types as a method of assessment in higher education courses. As KNUST advances towards the complete adoption of multiple-choice questions for high-stake paper-based summative assessments, there are associated challenges that accompany this phenomenon. Chiefly is them is placement of scantron sheets, time needed to mark the sheets and enormous pressure mounted on the Optical Mark Recognition device due to large students' numbers in KNUST. Hence, the study sought to investigate the feasibility ofe Examination as an alternative for paper-based examination, and evaluate students' acceptance of e-Examination. The study used a sample of 162 (n = 162) students in a multimedia in publishing course. Examinees performances in the e-Examinations were tested against five factors including prior experience of e-Examinations, digital literacy skills, gender, age and academic standings.

Keywords: e-examination, computer-based examination, learning management systems, digital literacy test, multiple-choice questions, objective-typed questions.

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Harry Barton Essel [α], Paul Kwame Butakor [σ] & Samuel Nortey [ρ]

Abstract- The previous era witnessed larger student numbers, reduced resources and increasing use of digital technologies which have led to the increased use of multiple-choice question types as a method of assessment in higher education courses. As KNUST advances towards the complete adoption of multiple-choice questions for high-stake paper-based summative assessments, there are associated challenges that accompany this phenomenon. Chiefly is them is placement of scantron sheets, time needed to mark the sheets and enormous pressure mounted on the Optical Mark Recognition device due to large students' numbers in KNUST. Hence, the study sought to investigate the feasibility ofe-Examination as an alternative for paper-based examination, and evaluate students' acceptance of e-Examination. The study used a sample of 162 (n = 162) students in a multimedia in publishing course. Examinees performances in the e-Examinations were tested against five factors including prior experience of e-Examinations, digital literacy skills, gender, age and academic standings. The results evident that prior experience of e-Examinations, digital literacy skills, gender and age did not have statistically significant difference on the e-Exams performance. However, academic standing had significant effect on the e-Exams performance. The examinees responses after experiencing the e-Exam were favourable towards its implementation for high stake summative assessment in the university. The study recommended that the university develops a policy that will drive the universal implementation of e-Examination for high-stakes assessments.

Keywords: e-examination, computer-based examination, learning management systems, digital literacy test, multiple-choice questions, objective-typed questions.

I. Introduction

State-of-the-art technology offers many new opportunities for innovation in educational assessment through rich new assessment tasks and potentially powerful scoring, reporting and real-time feedback mechanisms (Scalise & Gifford, 2006). Examination or testing in higher education plays a pivotal role when combatively assessing the learning outcome of a process; nonetheless, it determines whether effective teaching and learning has taken place in an academic process. Jamil, Tariqand Shami (2012) opine that examinations determine the extent to which educational objectives have been achieved as well as the extent to which educational institutions have served the needs of community and society. This highlights the awareness that examination, also described as test, extends beyond the frontier of measuring educational or societal objectives. The role played by examination in education process is to significantly define what transpires in the classroom and how teachers teach and students learn, and its impact on teaching and learning (Khattak, 2012).

In the higher education process, lecturers(Instructors) employ several high-stake summative methods to assess learning out comes; a key purpose of summative assessment is to record, and often grade, the students' performance in relation to the stated learning objectives of the programme (JISC, 2008). These summative assessment methods include paper and pencil-based examination, assignments, peer and group assessments, and projects-based assessments. When students are many, to effectually assess paper-based exams in bulk, man-power is not substantial; dead line have to be extended in such circumstances; Marking therefore, is a terrible experience (Bacon, 2012). None the less, deploying any of these high-stake assessment methods in Ghanaian higher education become difficult and occasionally ineffective due to large class size. The issue of large class size has arisen because of increase in the population, the quest for higher education and better living conditions of life (Yelkpieri, Namale, Esia-Donkoh, & Ofosu-Dwamena, 2012).Ricketts, Filmore, Lowry and Wilks (2003), opine that tuition fees are shooting up tremendously in higher education due to the cost of assessing large classes. Conversely, assessments which employ digital or open content shrink the cost of tuition (Wales & Baraniuk, 2008).

Large class size is an issue that bed evils comprehensive high-stake examination of students in

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the Kwame Nkrumah University of Science and Technology (KNUST). An initial observation on conventional examination evident that most lecturers in KNUST employed the Objective testing - Multiple Choice Question (MCQ) exams to be precise - as an auxiliary method to measure undergraduate students' academic achievements when confronted with large class sizes. According to Nicol (2007) multiple-choice questions (MCQs) are being progressively used in higher education as a means of augmenting or even substitute ingup-to-date assessment practices. As a stop-gap approach, the university academic board made it mandatory for all lecturers in KNUST to conduct high stake send-of-semester summative exams with MCQs for undergraduate programmes. However, in times of large class size and declining resources, MCQs can offer a viable addition to range of assessment types accessible to lecturers (McKenna & Bull, 1999). The introduction of MCQs, though effective with regards to assessments for large class sizes, has not utterly stamped out the issues associated with conventional high-stake summative examination somewhat making it unappealing (Archana & Leela vathi, 2013). The issue of examination malpractices, delay in results generation and instant feedback, mismanagement of print resources and invariable human errors due to negligence persist in conventional high-stake examination in Higher Education. Moreover, there is continually enormous pressure on the Optical Mark Recognition (OMR) device as lecturers who used Optical Answer Sheets (Scantron sheets) submit for marking. Though, lecturers occasionally resort to marking the sheets manually in lieu of anticipated delays and erroneous results in marking the optical answer sheets with OMR device. Suggestively, it has become imperative to look at alternative exemplars of assessing high-stake summative examinations at the KNUST; henceforward, the need to explore and adopt computer-based examination or e-Examinations.

The study, however, sought to test the practicality of implementing high stakes computer-based examination by exploring examinees (students) exposure to and performance of computer-based exam, and factors relating to acceptance or rejection of e-Exam exams. The factors considered for the study included prior experience in computer-based exams, digital literacy skills, gender, age and academic standing. Additionally, the study is limited to MCQ sand other objective-based question types; however, the study does not consider the validity of the question types implemented.

II. Computer-based Examination

Computer-based systems of examinations which are termed as "Computer Assisted Testing, Computerized Assessment, Computer-Based Testing (CBT), Computer-Aided Assessment (CAA), Computer-Based Assessment (CBA), Online Assessment, e-Assessment and Web-Based assessment"(JISC, 2008), are shifting the paradigm of examinations in higher education from traditional paper and pencil based examination(Uysal & Kuzu, 2009).Luecht & Sireci(2011) opines that Computer-Based Examination in corporate myriad assessment types, purposes, test delivery designs, and item types appropriated for educational accountability and achievement testing, college and graduate admission testing, and adult education use. According to Chalmers and McAusland (2002) pedagogically Computer-Based Examinations enable instructors to test their students covering a wide range of content, reduced instructors' workload especially in the case of double marking, saved time and resources, and helping to identify students' learning problems by adapting to match their abilities.

III. Materials and Methods

a) Research Instrument

An Online Survey System (OSS) was used to obtain data from the students sampled for the study as it is a great way to reach and engage with target audience (SmartSurvey, 2017).The survey contained four (4) questions and was administered to respondents at the end of the study to evaluate their experience and acceptance of e-Examination. The OSS was administered to the respondents by generating a short Uniform Resource Locator (URL) which was posted on the LMS used for the study.

The Microsoft Digital literacy test was also used to assess the digital literacy skills of the respondents. The test assesses five dynamic concepts including Computer Basics; the Internet, Cloud Services and the Web; Productivity Programs; Computer Security and Privacy; and, Digital Lifestyles. The test wasbased on Version 4 of the Digital Literacy Standard Curriculum which clarifies generic ICT skills and concepts(Microsoft Corporation, 2018).The test consisted of 30 questions, and it covers all the five key areas of the curriculum. Data for the study was collected within a period of 4 months (January 21 to May 15, 2018).

b) Survey Participants

Respondents for the survey involve done hundred and sixty-two (n=162) final year student examinees in the multimedia course who had registered for the second semester of the 2017/2018 academic year. There were 89 (54.9%) males and 73(45.1%) females involved in the study. It was a prerequisite for the 162 students to sign up to the LMS which was used to administer the e-Exams. Students are automatically assigned to Digital literacy test,5 weekly quizzes for formative assessments, a mid-semester exam and an end-of-semester exam after signing in into the LMS. Except the digital literacy test, the other examinations

were categorized into formative and summative e-examinations. The five weekly quizzes constituted the formative e-exams while the mid-semester and end-of-semester activities constituted the summative e-exams. The e-examinations were scheduled for specific days and timed accordingly. Each quiz had 20 items to be completed in 12 minutes; the mid-semester and end-of-semester had 150 (85 minutes) and 200 (110 minutes) items correspondingly. All students who completed the computer-based examinations were asked to appraise their experience by answering an online-based questionnaire directly after completing the end-of-semester CBE; the return rate of responses for the questionnaire was 100% of the sample.

Data were analyzed using mean and standard deviation. Inferences was made from the data employing correlational analysis, independent sample t-test (with unequal variance) and one-way Analysis of Variance (ANOVA) with a confident Interval of 95% at a 0.05 (5%) level of significance.

c) Course Content and Implementation

Multimedia in Publishing course, which is part of the undergraduate Publishing Studies programme, was used to effectively and efficiently implement and evaluate students' acceptance and academic performance in the Computer-Based Examination. The course adopted a hybrid or mixed model (face-to-face and online learning) as the instructional stratagem. The discrete units of the course were arrayed using Schoology, a cloud-based Learning Management System (LMS) that allows students and faculty to communicate, share resources, host collaborative groups, and stay actively engaged from any device (Schoology, 2018). Students had to sign up to gain access to the contents of the LMS.

The strategy for instructional delivery in the course combines theoretical know-how, and practical skills carried out in a computer laboratory to help students gain mastery in the planning, designing and development of web contents. The course was taught across 12 weeks within an academic semester interspersed with five weekly quizzes. The weekly quizzes focused on previous lessons taught and used as "scored formative" assessment to examine and heighten students' comprehension in the course. The quizzes were used as means of scaffolding students experience with CBE since it was their first-time involvement. Students' summative assessments were based on a mid-semester and end-of-semester examinations which were both proctored in a well-stocked and connected computer laboratory. All the examinations (including the 5 weekly quizzes) were strictly CBE; no pencil-and-paper based exams were employed in the study. The weekly quizzes, mid-semester and end-of-semester e-exams were set with objective-typed questions which included multiple-choice, True/False, Ordering or ranking, Fill-in-the-Blank and Matching questions.

IV. Results and Discussions

a) Need assessments of examinees

Meta-analysis of research works manifested that the digital divide is gradually tapering and ICT education is accentuating in Ghanaian higher education. This is attributable to the fact that the global impression of ICT integration is differentiated as additional motivation to learn to deriving from the Hawthorne effect of novelty; or a skill set to master in addition to the content knowledge addressed (Fluck, Pullen, & Harper, 2009) providing state-of-the-art technologies and flexibility to engage students to work smarter(Media Planet, 2014).The focus of the needs assessment was to ascertain the personal operational ICT skills of the examinees; and other known online technologies available to them (Table 1).

Table 1: Sample ICT personal operational skills (digital literacy); self-ratings by examinees

Variable	ICT personal operational Skills					
	Excellent	Very Good	Good	Average	Low	Total
Gender						
Male	-	21 (13.0)	51 (31.5)	15 (9.3)	2 (1.2)	89
Female	-	7 (4.3)	38 (23.5)	25 (15.4)	3 (1.9)	73
Total		28 (17.3)	89 (54.8)	40 (24.7)	5 (3.1)	162

Examinees' digital fluency plays a pivotal role in the effective deployment of Computer-Based Examinations. None the less, the format and demands of Computer-Based Examinations require that students obtain a constructive level of ICT expertise. (Chalmers & McAusland, 2002) by the instructor. From Table 1, 17.3% and 54.8% of the examinees rated themselves as very good and good personal operational ICT proficiency ratings respectively, while 25.0% rated themselves as averagely skills; and 3.0% of the examinees registered poor know-how. About gender, table 1 also shows male examinees rated their digital literacy level higher than the females. The overall results indicate that there is substantial rating of digital literacy with regards to the examinees used for the study though 3.0% of the sample were digital immigrants.

Table 2: Learning styles inventory, Age and prior CBE exposure and academic standings of examinees

Variable		Frequencies			
		Male	Female		Total
Learning Styles					
Aural		29 (17.9)	29 (17.9)		58 (35.8)
Visual		39 (24.1)	26 (16.0)		65 (40.1)
Kinesthetic		21 (13.0)	18 (11.1)		39 (24.1)
Age					
22 - 25		62 (38.2)	57 (35.2)		119 (73.5)
26 - 31		20 (12.3)	9 (5.6)		29 (17.9)
32- 37		4 (2.5)	5 (3.1)		9 (5.6)
above 37		3 (1.9)	2 (1.2)		5 (3.1)
Previous Experiences with other CBE Systems					
Yes		11 (6.8)	12 (7.4)		23 (14.2)
No		78 (48.1)	61 (37.7)		139 (85.8)
Academic standing					
First Class		6 (3.7)	14 (8.6)		20 (12.3)
Second Class Upper		46 (28.4)	44 (27.2)		90 (55.6)
Second Class Lower		32 (19.8)	15 (9.3)		47 (29.1)
Pass		5 (3.0)	-		5 (3.0)

Table 2 evident that there are more visual learners that aural and kinesthetic leaners in the study. This implies that most of the examinees are spatial learners; hence, they will better understand and retain information when ideas, words, and concepts are associated with images (Inspiration Software, Inc., 2015).The learning style similarly influenced the presentation of the test driver's Graphical User Interface (GUI),activities and canons of the question prompts.

It was also realized that majority (73.5%) of the examinees fall within the modal class of 22 -25 years. The results also show that there were more males in the modal class as compared to females. However, the age groups were recategorized into two groups (25 years of age and under; and 26 years above) to determine whether the performance of examinees and acceptance of e-exams differed among the groups.

Examinees' prior experiences with other CBE systems (i.e.online quizzes and other test drivers) were crucial to the study. Table 2 evident that minority (14.2%) of the examinees had prior experiences with other computer-based assessment systems which included Driven Vehicle and License Authority (DVLA) test, Students Aptitude Test (SAT online) and quizzes from online courses. The data infers that majority (85.8%)of examinees were novel and needed probationary exposure to the CBE system as they had marginal experiences.

Examinees' academic standings were also considered as an independent variable to infer whether it will have a significant effect on their performance in the e-Examinations. The result in table 2show that majority (55.6%) of the examinees were within the second-upper division; implying standard academic standing of the examinees.

The result of the preliminary study influenced the choice of the test driver for computer-based examination, the presentation of the Graphical User Interface, organization of the question prompts as well as test delivery model to implement. Furthermore, these factors were used to govern the difference in performance and acceptance of the e-Examinations.

b) Scaffolding Experience of the Computer-Based Examination for Examinees

Examinees ability to effortlessly navigate the e-Examination system was very crucial in the study; hence, the need to introduce original activities that will scaffold examinees' experiences from the actual

development level (with or without prior experience with other e-Exam platforms) to the potential development level in CBEs. According to Wertsch (1984) Vygotsky opinionated that when a student is at the Zone of Proximal Development for a particular activity, providing the needed assistance (Scaffolding) afford students enough encouragement to achieve the activity. In order for examinees to effectively navigate thee-Exam platform, three equally weighted activities were designed. The activities were to assist examinees negotiate a new learning curve in CBE ecosystem, and also accelerate summative grading for the study. The digital literacy test constituted activity one. The test served as diagnostic assessment tool to perceive examinees' basic skills in computing; the Internet, Cloud Services and the Web; Productivity Programs; Computer Security and Privacy; and, Digital Lifestyles; however, the emphasis was on basic computing skills. Activity two (Formative e-Examinations) comprised of the five (5) weekly quizzes structured from the individual units of the multimedia course. The purpose of activity two was to heighten and scaffold the formative experiences and adaptability of the examinees to the CBE system. However, activity two was synchronous home task (all 5 weekly quizzes not proctored but equally timed) in which examinees explored new learning outcome realized uniquely through computerized examinations. The five weekly quizzes were used for formative objective assessments, purposely, to motivate and encourage students to keep pace with teaching and learning; and also, monitor their progress on the use of the CBE platform.

Activities3 was mid-semester and end-of-semester e-Examinations. This activity (summative e-Examination), likewise, were time bound but proctored under stringent exam conditions in a well-equipped brick-and-mortar computer lab with low latency and jitter-free internet connection.

c) Setting Objectives Question Types for the e-exams

Zakrzewski (2002) discourses that, objective testing is the most commonly used form of e-examinations. Formulation of question prompts for the e-examinations was based on a synergy of the content of the multimedia course and experiences with paper-and-pencil test concepts. The core of any robust system of CBE is the creation of appropriate, user-chosen question pools with appropriate question prompt to be built upon over time, allowing their reuse in suitable circumstances and ensuring time savings.

The nature of question prompts for the e-exams revolved around two commonly adopted Multiple Choice Question (MCQ) Types, i.e., A-Type and R-Type. The A-Type typically provides 4-5 options - without any psychometrical law behind the number of options - from which the student can choose; and, the R-Type involves given a theme for each question, where students match the options with the scenarios, and the matching process is introduce by a lead-in question (Abdalla, Gaffar, & Suliman, 2011).The Blooms digital taxonomy for evaluating digital tasks was used as a basis to formulate the objective type questions as it gives flexibility in framing, classification, and breakdown of what learning outcomes and thinking skills expected in every learning task (Churches, 2008).The questions were set to appraise the experiences of examinees from low order thinking skills (LOTS) to high order thinking skills (HOTS).Churches (2008)and Krathwohl (2002) describe the spectrum of LOTS to HOTS as follows: remembering, understanding, applying, analyzing, evaluating and creating, and this is evident in figure 1.

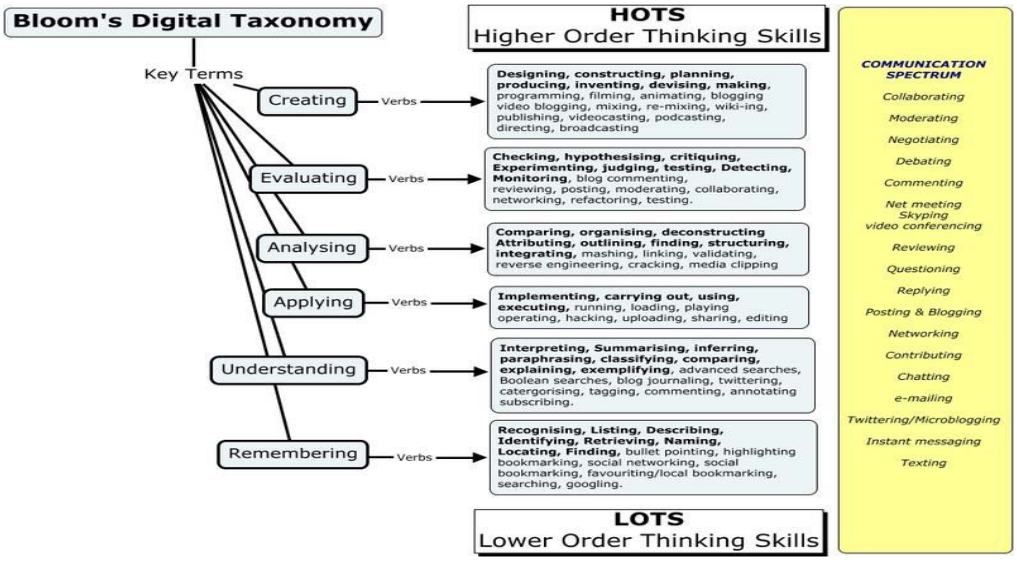

Fig. 1: Bloom's Digital Taxonomy
(adapted from Educational Origami, cited in Munzen maier & Rubin, 2013)

The Objective Test Questions (OTQ) adopted for this study was also based on the categorization of Computer Assisted Assessment Centre (CAAC). McKenna and Bull (1999) emphasize that, Objective Test Questions are well-suited for Computer-Based Examination as the right responses are pre-determined. Table 1 is a matrix table that illustrates how the Bloom's Digital Taxonomy was employed to formulate objective type questions that reflects the various thinking skills.

Table 3: Matrix of Bloom's Digital Taxonomy and Objective Test Questions in designing questions for the e-examination

Objective Test Questions	Bloom's Digital Taxonomy Lower Order Thinking Skills<----------->Higher Order Thinking Skills					
	Remembering	Understanding	Applying	Analyzing	Evaluating	Creating
Multiple Choice Items(MCQ)	•	•	•			
Multiple Response Questions	•	•	•	•	•	
Extended MCQs	•	•	•	•		
Assertion Reasoning Questions	•	•	•	•	•	•
Matching Questions	•	•	•	•		
Fill-in the blank Questions	•	•	•	•	•	•
Ranking Order Questions	•	•	•	•		
Sore finger Questions	•	•	•	•	•	•
Graphical Hotspot Questions	•	•	•			
Sequencing Questions	•	•	•	•	•	•

Source: Authors' construct 2018

MCQ types adopted and adapted are modified for the e-exams to develop new rubric for the question base reflecting the functionalities of the CBE platform. Depending on the number of correct options the examinee selects, differentiated points (Marks) are allotted to a question prompt.

d) The Architecture of the Computer-Based Examination test drivers

The e-exam platform used functions on a 3-tier architecture, namely, the presentation, logic and data tiers, which is a three-way interaction in a client/server environment (Sarma, 2009). The presentation tier is the Graphical User Interface (GUI) of the CBE platform representing the top-most level. The function of the GUI is to translate tasks and results in something the user can understand. The logic or business tier coordinates application and process commands, make logical decisions and evaluations, and performs calculations. The data tier stores or retrieve questions prompts from a database or file system. The question prompt is passed back to the logic tier for processing and eventually back to the examinee. The 3-tier architecture gave the researchers the opportunity to fully integrate third-party applications (plugins) and enhanced logic (additional question types) to alter the functions of the e-exam platform.

The presentation tier or client-side functionality of the CBE platform are modularized into authentication or identification module, and assessment or examination module:

- The authentication module, which encompasses the username and password verifications, validates the login details of both the lecturer and students. The validation process gives the examiner (lecturer) the privileges to create, update, upload and administer the question base. The students on another hand, if appropriately verified, have the pleasure to join a course as a digital citizen of the CBE platform.
- The assessment module presents the examiner with options to enhance the policy settings for the examination (time, date, number of question, types of questions, randomization of the question and answer presentation, and Marks per question) before uploading for examinees to attempt. Examinees, after verification, see the questions on the screen if uploaded.

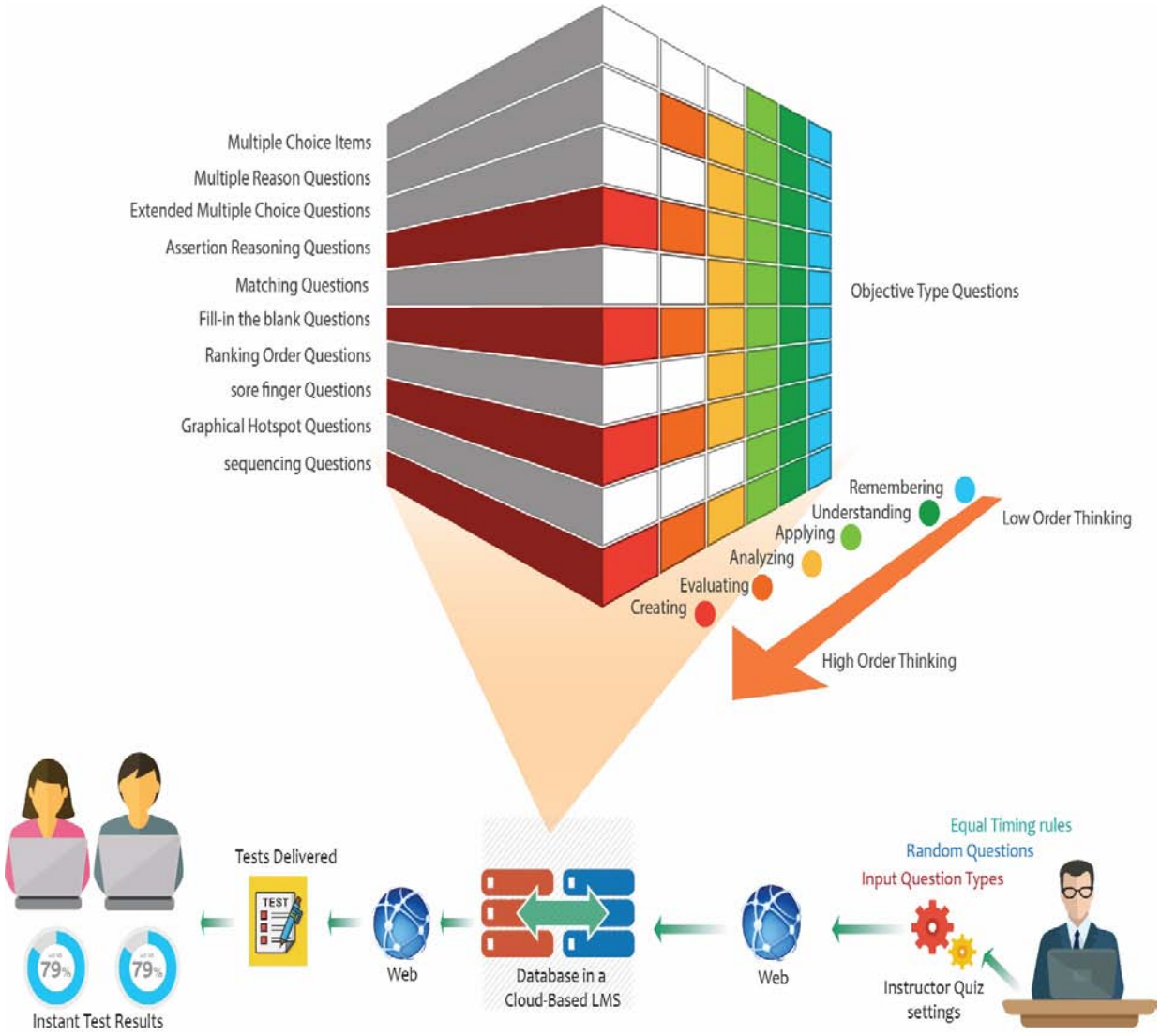

Figure 1: Represents the workflow or implementation model of the CBE system

Table 4: Examinees' experiences and performance in the CBE

Examination	N	Mean (M)	Standard Deviation (SD)	Median	Mode	Highest Score	Lowest Score
Digital Literacy Test	162	7.61	1.92	8.33	9.33	9.97	1.0
Quiz One	162	5.82	1.52	6.0	6.5, 7	9.0	-
Quiz Two	162	4.97	1.73	5.0	5.0	8.7	-
Quiz Three	162	5.58	1.89	5.75	6.0	10.0	-
Quiz Four	162	5.74	2.12	5.80	-	9.33	-
Quiz Five	162	6.29	1.36	6.33	5.0	9.11	1

Formative experiences: As evident in table 4the average scores and standard deviations show there were variations in the formative e-Exams (digital literacy skill test and the five weekly quizzes) administered to the examinees. The digital literacy test recorded a mean (m=7.91; sd=1.81) which represents the highest mean of all the formative. These infer that examinees' digital literacy skills - in terms of knowledge, the ability to manipulate and maneuver computers – are substantial.

Table 5: Associations between digital literacy test and the five weekly quizzes (n = 162)

	Digital Literacy Test	Quiz 1	Quiz 2	Quiz 3	Quiz 4	Quiz 5
Quiz 1	0.2240* 0.0042	1.0000				
Quiz 2	0.2984* 0.0001	0.4301* 0.0000	1.0000			
Quiz 3	0.2863* 0.0002	0.4666* 0.0000	0.4016* 0.0000	1.0000		
Quiz 4	0.2780* 0.0003	0.4353* 0.0000	0.4615* 0.0000	0.3966* 0.0000	1.0000	
Quiz 5	0.0917 0.2461	-0.0909 0.2498	-0.0156 0.8438	-0.0246 0.7558	-0.0642 0.4171	1.0000

Significant at 0.05*, Confident Interval of 95%, Sig. (2-tailed)

The study wanted to establish whether there was a constantly progressive pattern in the five formative quizzes; and correspondingly, the association between examinee's digital literacy score and the quizzes. The results from a Pearson product-moment correlation coefficient computed to assess the relationship between the formative e-Exams revealed moderate and low positive linear association between the five quizzes (Table 5). These indicate at that there was a progressively marginal pattern between the quizzes as relatively similar scores are observed. The results also indicate that obtaining a high score in the digital literacy test does not correlate increase in the score of any of the other five quizzes; hence, examinee's basic skill in computing did not have an impact on the formative experiences of the examinees.

Furthermore, the study also estimated the effect of gender on the formative e-examination scores using an independent T-test (p = 0.05, unequal variance). The results evident that there is no significant difference between the digital literacy scores of the male (n=89, m=7.63,sd=1.974) and female (n=73, m=7.6, sd=1.855)examinees who took part in the study; t(157.034) = 0.0906, p = 0.9279 .In table 6, the results show that gender had a significant effect on the scores for quizzes 1 to 3,implying differences in the performance of the males' and females' formative e-exams scores. However, the was no significant effect of gender on quizzes 4 and 5 implying similarities in the formative e-exam scores for males and females. Though there were differences in gender distribution in the first three formative e-exam scores, it improved with the subsequent e-exam scores.

s of gender on the formative

Table 6: Effect

e-examination scores

Quiz	Independent T-test (unequal variance)
1	t(159.546) = 2.5125, p = 0.0130
2	t(159.533) = 2.2410, p = 0.0264
3	t(159.189) = 2.0156, p = 0.0455
4	t(158.844) = 1.7652, p = 0.0795
5	t(157.331) = 0.2504, p = 0.8026

Summative Grading: In table 7, both summative CBEs generated different means (m_{mid} =47.06, sd_{mid}=12.35; m_{end} =50.25, sd_{end} =11.74). The results indicate that the examinees performed slightly better in the end-of-semester exam as compared to the mid semester exam. Moreover, the variability of the two examinations show that results obtained by examinees in the mid semester exam was a bit varied than the end-of-semester exam.

Table 7: Examinees' scores on Summative Assessment Exams (N = 162)

Examination	N	Mean (M)	Standard Deviation (SD)	Median	Mode	Highest Score (100)	Lowest Score
Mid-Semester	162	47.06	12.35	47.98	39.32	72.92	17.20
End of Semester	162	50.25	11.74	50.84	51.6	83.77	15.80

There was a low linear positive correlation between digital literacy test score and the summative e-Exams scores (Table 8)inferring that an examinees' digital literacy levels had marginal increase on the mid semester and end-of-semester performance.

Table 8: Association between mid semester and end-of-semester examination (N = 162)

	Digital Literacy score	Mid semester Examination	End-of-semester examination
Mid semester Examination	0.2161* 0.0057	1.0000	
End-of-semester examination	0.1020 0.1966	0.5259* 0.0000	1.0000

Significant at 0.05*; Confident Interval of 95%; Sig. (2-tailed)

Table 8 also revealed a significant pattern between the mid semester and the end-of-semester e-Examinations. The Pearson product-moment correlation coefficient designated moderate positive association between the two examinations. The association indicates that an increase in the mid semester examination taking by the examinees correlated an increase in the end-of-semester examination.

Table 9: Effects of gender on the summative examination scores (N = 162)

Quiz	Independent T-test (unequal variance)
Mid semester Exams	t(154.839) = 0.9931, p = 0.3222
End-of-semester Exams	t(157.533) = 1.5173, p = 0.1312

Evaluation of the summative e-exams scores revealed no significant difference (P>0.05) among male and female examinees (table 9) who participated in the study. It implies that gender did not play a considerable role in the performance of the examinees in both summative e-exams.

Likewise, One-way ANOVA is conducted to compare the effect of academic standing of examinees on the summative e-exam performance. The results revealed that there was statistically significant difference between academic standings on the mid semester (F(3, 158) = 21.42, p = 0.000) and end-of-semester (F(3, 158) = 16.15, p = 0.000)e-exams at the p<.05 level. Regarding the mid semester e-exam, a Tukey post hoc test revealed the mean score of examinees whose academic standing was first class (m=59.04, sd=10.53) was significantly different from those with second class upper (m=49.25, sd=10.45), second class low (m=39.19, sd=10.4) and pass (m=33.74, sd=12.73).Additionally, those whose academic standing were second class upper had a significantly different mean score than examinees with second lower and pass. However, the score of examinees with second class lower did not significantly differ from those with pass. These suggest that higher academic standings of examinees had an effect in the mid semester e-exam scores.

With the end-of-semester exams, the Tukey post hoc test revealed that the mean score of first class examinees (m=60.79, sd=9.99) was statistically significantly different from those whose academic standing falls within second class upper (m=51.38, sd=9.29), second class lower (m=44.28, sd=12.83) and pass (m=33.72, sd=9.3). There was no statistically significant difference between the mean score of examinees with academic standings of second class low and pass. In a nutshell, these results suggest that high academic standings also had effect on the end-of-semester e-exam. Examinees with higher grade point performed better in the summative e-Examinations; this implies that academic standings can be an influential factor in determining the performance of an examinee in a summative e-examination.

e) Examinees responses after experiencing the Computer-Based examination

Upon completion of the summative e-exams, the examinees were giving a one-page survey to answer; the survey contained four questions. This exercise was voluntary; however, all the 162 examinees responded. The responses given by the examinees-being the first cohort to take summative e-exam, made the researchers feel a great deal of responsibility for making the summative e-exam experience one which students would want to reiterate. Moreover, there is also the likelihood the thoughts of the examinees would sculpt sentiments of innovation in KNUST with regards to summative e-exam implementation.

Feedback on the formative e-exams taken by the examinees (97%) suggest that it had a high impact on their preparation towards the summative e-examinations; a minority (3%) found the formative e-exams moderately useful.

Another critical question on the survey asked if the examinees would prefer the paper-based examination administration to a Computer-Based Examination. Opinions of the examinees were varied as109 (67%) and 31(19%) supported Computer-Based Examination and paper-based examination respectively while 22(14%) opted for both modes for delivering high-stake examinations. This finding supports that of Fluck, Pullen,and Harper (2009) compare with the study by Jonsson,Loghmani, and Nadjm-Tehrani (2002) where 95.4% of the sample preferred e-examination. Examinees who preferred paper-based examination confirmed that they are familiar with it hence transiting to CBE has not been a laid-back experience.

With regards to proportion reporting technical issues in the e-examinations, it is realized that the majority of the examinees (51%) stated difficulties with the formative e-exams. Chiefly among the technical

hitches encountered by the examinees included internet connectivity which may be a result of the examinees' dependency on wide-ranging Internet Service Providers to access the e-exams. Moreover, the examinees also complained about the timing allotted for the e-exams. However, there were no complains of routine complications on the summative e-exams by the examinees (100%). The complications are seemingly attributable to the conducive examination atmosphere provided for the e-examination.

V. Conclusion

E-examinations is an innovative engineering initiative that can changing the face of high-stake objective-typed questions for examination in KNUST. This study found that examinees (students) performance in the objective typed e-exams was substantial, hence, reflecting examinees' entire acceptance of e-exams. Furthermore, this case study of using objective-typed questions for high-stake summative e-examination have revealed noteworthy evidence about ICT insurgency which have inferences(Fluck, Pullen&Harper, 2009)in the direction of the mandatory implementation of Multiple-Choice Questions for assessment in KNUST. Though it is a known fact that paper-based exam is the standard in KNUST, capitalizing on e-examination may bring transformational returns for contemporary students who are more motivated and adaptive to digital technologies.

The e-exam model employed for the study support and validate the basis for university-wide implementation of computer-based MCQ and other objective typed questions for summative assessments. Moreover, the positives aspect of e-examination using objective-typed questions, and the absence of undesirable associations realized can be communicated to first-time examinees to maximize acceptance towards the implementation of e-exams (Boevé, Meijer R, Albers C, Beetsma, & Bosker, 2015). Finally, having huge question prompts in the database for the e-exams can assist as a measure to curb the pervasiveness of examination malpractices in MCQ test administration.

Further studies can be conducted to test the variability of acceptance among the different academic levels as possibility of students viewing e-examinations inversely at different level could be influenced by factors such as academic and technological experiences. Correspondingly, Adaptive e-examination administration can be explored for summative assessment.

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Jewelry Education in Ghana: A Comparative Analysis of School-Based and Apprenticeship Programmes

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Abstract- Acquiring jewelry education to become a jeweler in Ghana is either by School-Based or Apprenticeship. A concern expressed by some jewelry industry practitioners is that most students who acquire jewelry education through School-Based in Ghana are unable to practice as jewelers because there is a mismatch between skills that students acquired while in school and the jewelry industry's needs. Correspondingly, Jewelry Apprenticeship has also saw a decline in patronage in recent times due to lack of regulatory framework, which has led to some Master and Apprentice Jewelers exploiting the training process. This study sought to conduct a comparative analysis to establish the similarities and differences that exist between these two Jewelry programmes. The study adopted the Mix Methods research approach with descriptive and evaluation as the research methods used. The researchers used Purposive and Snowball sampling techniques to draw a sample size of 300. Data collection tools used were observation, interview, and questionnaire.

Keywords: *comparative analysis, jewelry, jewelry apprenticeship, school-based education, jewelry education.*

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Jewelry Education in Ghana: A Comparative Analysis of School-Based and Apprenticeship Programmes

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Abstract- Acquiring jewelry education to become a jeweler in Ghana is either by School-Based or Apprenticeship. A concern expressed by some jewelry industry practitioners is that most students who acquire jewelry education through School-Based in Ghana are unable to practice as jewelers because there is a mismatch between skills that students acquired while in school and the jewelry industry's needs. Correspondingly, Jewelry Apprenticeship has also saw a decline in patronage in recent times due to lack of regulatory framework, which has led to some Master and Apprentice Jewelers exploiting the training process. This study sought to conduct a comparative analysis to establish the similarities and differences that exist between these two Jewelry programmes. The study adopted the Mix Methods research approach with descriptive and evaluation as the research methods used. The researchers used Purposive and Snowball sampling techniques to draw a sample size of 300. Data collection tools used were observation, interview, and questionnaire. It emerged that the two jewelry education programmes have some similarities and differences in their processes of teaching and learning of jewelry that has to enable them to train jewelers for the industry. There is the need to incorporate where possibly the good practices of one system of jewelry education into the other.

Keywords: comparative analysis, jewelry, jewelry apprenticeship, school-based education, jewelry education.

I. Introduction

All over the world, different cultures/countries have a unique vocation that is practiced by its people. Jewelry (Goldsmithing) is one of such careers which is practiced in Ghana. Acquiring education to build a profession in Jewelry making in Ghana is done either through School-Based or Apprenticeship. Fening (2015) postulates that School-Based Jewelry education in Ghana started at the tertiary level in Kwame Nkrumah University of Science and Technology, Kumasi in 1968 and at the second cycle level in 1990 at the then Labone Secondary School. Since then many other schools both at the second cycle and tertiary levels in Ghana have introduced Jewelry into their programmes of study (CRDD 2008).

A concern expressed by some players in the jewelry industry in Ghana is that most students who acquire jewelry education through the School-Based programme are not able to practice as jewelers after graduation (E. K. Asante-Asare, personal communication March 20, 2016). The worry of the jewellery practitioners is that there is disparity between what is teachers teach and that of jewelry industry's needs (Atchoarena 2001). Before the introduction of school based jewelry education in Ghana, acquiring skills in jewelry making was only possible through apprenticeship. Even that one could get the opportunity to learn jewelry through once family relation to a jeweler, because they consider jewelry trade to be a legacy preserved for particular family and could only be passed on to its generation with women being excluded from practicing (Kotoku 2009; Palmer 2009). Available statistics show that apprenticeship in the area of Jewelry is responsible for training about 80 to 90% of Jewelers in Ghana (Atchoarena & Delluc 2001). However, patronage in jewellery apprenticeship has decline in the in recent times (Kotoku; Fening & Asomaning 2014). Among the reasons for the decline is the lack of policy that regulates the Apprenticeship in Jewelry system. Even though an Act of Parliament (Act 718) which was promulgated in 2006 to established Council for Technical and Vocational Education and Training (COTVET) to manage and oversee all aspects of Technical and Vocational Education and Training in the formal, non-formal and informal sectors of the country. Mean while the jewelry apprenticeship in Ghana is still not being regulated (A. R. O. Addo, personal communication, December 14, 2017).

According to Palmer (2009), the lack of regulatory framework has led to the exploitation of the apprenticeship programme by some masters and apprentice jewelers. For instance, some masters deliberately refuse to teach the apprentices what they should know to become jewelers (Anokye & Afrane 2014). Instead, the apprentices are used by their master to do all of the works (including domestic chores and source of cheap labor) that is not related in training to become a jeweler (Donkor 2006).

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Notwithstanding these problems, there are indeed some good practices within these two modes of acquiring Jewelry Education in Ghana. This study therefore, sought to undertake a Comparative Analysis to establish the similarities and differences between these two Jewelry Education programmes in Ghana.

II. Literature Review

a) Vocational Education Training

For me, the big driver in vocational education is that it involves real-time, real-world activities, with an opportunity to have a coach or guide available to review feedback, reflect with the person, or even to be that guiding hand through the process. (Andy Symth cited in Lucas, Spencer & Claxton 2012, p. 59).

The significance from Smith's statement is that the aim of Vocational Education and Training (VET) to be imparting individuals with skills that can be applied on-the-job at the workplace. In other words, individuals who acquire VET stand a chance of having direct and instantaneous effects on productivity which eventually contribute to economic growth. According to Greinert (2005), VET was introduced into the school-based system to enhance the apprenticeship system of training. However, apprenticeship turned out to be a source of training skilled labor in countries (Ghana and many African Countries) where VET in mainstream education is not well established (Aryeetey, Doh & Andoh, 2011).

Cohisn and Barnaart (2010) posit that Technical and Vocational Education is seen as the best avenue to eradicate poverty, especially in the developing countries. In this respect, multinational agencies including, The World Bank, United Nations Educational, Scientific and Cultural Organization (UNESCO) and ILO pulled resources together to push for the establishment of Technical and Vocational Education in those countries.

b) School-Based Jewelry Education in Ghana

Fening (2015) posits that jewelry is taught and learned at two levels of Ghana's educational system, these are Senior High School (SHS) and colleges or universities. Whereas the SHS level treats jewelry as a subject under Visual Art programme, those at the tertiary offer it as a programme. For example, AsanSka College of Design and Technology located in Accra runs a Bachelor of Arts in Jewelry Design Technology whiles KNUST in Kumasi offer both bachelor and Master degrees (BA and MFA in Jewelry and Metalsmithing programmes) respectfully. Others are Wa Polytechnic, and Takoradi Technical University are in the far advance process of introducing Jewelry.

Available information indicates that about twenty (20) SHS in Ghana offer Jewelry. Some of the SHS that offer Jewelry are, Achimota SHS, Kinbu Secondary Technical, Mawuli Senior, Chemu SHS, Amasaman SHS, Diaspora Girls La-bone SHS and Prempeh Senior High (Fening).

c) Apprenticeship

Apprenticeship is a system of acquiring knowledge and occupational skills through a combination of practical work experiences and in some jurisdictions theoretical component under the mentorship of Master Craftsman (MC) either in the classroom or at home (Chankseliani & Relly 2015). An empirical study identified informal apprenticeship as a provider of skills to young people in African countries. Unfortunately, available information by Nübler, Hofmann, and Greiner (2009) indicates that training policies in many third world countries paid more attention to promoting the formal vocational education and training system at the expense of the apprenticeship system. Some of these countries virtually have no training policies that give credence to the indigenous system of acquiring acknowledge and skills is considered as a contributor to the growth of a country's economy. As a matter of urgency policy makers needs to redirect their attention towards the informal apprenticeship training system which has the prospects of increasing youth employability, the productivity of enterprises, decent work as well as foster local and economic development. The ILO has led the way by launching a work programme on apprenticeship systems to identifies informal apprenticeship as the surest mode of training people for the informal sector of some third world countries (Ahadzie 2003; Walther 2008; Palmer, 2009).

Nilsson (2010) asserts that apprenticeship whether formal, informal or non-formal is useful for the following reasons:

i It is a means for promoting strong social integration.
ii It is a production hub for training human resource with the needed, skills and knowledge for the continue running of the industries.
iii It ensures regular a supply of skilled personnel for various trades.
iv Young people who yearn for a career when they start entering the working world and sign on to an apprenticeship system tends to derive a lot of benefits. As they go through apprenticeship and can complete, s/he is can build the confidence needed to secure their future with a good standard of living because the training acquired in the crafts are the skills that deemed highly in demand.

d) Apprenticeship Training Process in Ghana

Relating apprenticeship training to other skills development system Anokye and Afrane (2014) stated that apprenticeship training is an art and depend on the level of expertise of the MC as well as the methodologies s/he uses to handover the knowledge and skills to the apprentice. In effect, the training that is

offered establishes the type of Master Craftsman s/he produces. The process of training apprenticeship has been described by Frazer (2006) as a four-phase process, and they involve; the introductory stage; tools, equipment and materials; manufacturing process; and business management skills.

e) Comparative Research

Smelser (2003) posits that scholars have acknowledged comparative study as a research method that involves the description and explanation of similarities and differences of cases or outcomes that exist between social units, mostly in the area of regions, nations, societies, education, and cultures. In a like manner, it encompasses the analysis and synthesis of the likenesses, differences, and designs that reflect through two or more cases with a mutual focus or goals. The comparative analysis which is also known as comparative studies includes analysis and synthesis of the commonalities, variances, and patterns across binary or more cases that are required to attain a single outcome (Enli 2010).

Pickvance (2005) is with the view that though giving the bare description of data in a chronologically manner certainly provides information on the cases that is understudy, referring to this as comparative will fall short of pointing the variances and resemblances out to the reader. Successful execution of comparative study demands that the specific components of each case have to be spelled out in details, its rationale for selection has to relate to the main research questions as well as linking it to what is under investigation (Smelser). These will help in creating the basis for the analytic framework that will facilitate the cross-case comparison.

As it is already stated, the two most expected outcomes of comparative analysis are focused on the explanation of both the differences and similarities that exist between cases in order to ascertain the understanding, clearing up and construing of diverse historical outcomes, so that their significance is processed for their use in present institutional arrangements (Kamarainen 2015). But Ragin (2000) argues that some comparativists do not necessarily have interest in the relations between variables that symbolize broad groupings of cases but rather place more premium on themselves, particularly the different historical experiences.

The known classification of comparative analysis into types is outlined in the work of Tilly (1984). These include; Individualizing, Universalizing, Variation-finding, and Encompassing.

III. Materials and Method

The researchers adopted elements of both qualitative and quantitative research approaches in the study. The use of this research approaches opened up options of research designs for the study. Subsequently, descriptive and evaluation research designs were applied to address the concerns raised by the researchers in the study. A population of 300, comprising lecturers, student, master jewelers and apprentice jewelers were sampled through purposive, snowball and stratified sampling techniques from the Metals Product Design Section, KNUST in Kumasi and AsanSka College of Design and Technology in Accra to represent School-Based Jewelry Education. Again, the researchers also used some members of the Federation of Ghanaian Jewelers in Accra and Kumasi as the representation of Apprenticeship Jewelry Education in Ghana.

Data collection was done through the use of observation, interview, and questionnaire as tools. The two (observation and interviews) were used as to collect data because most of the respondents from the apprenticeship programme (both masters and apprentice jewelers) could not read and write effectively, and the number of lecturers involved was also not many. Secondly, these two data collection tools aided the researchers to check for nonverbal expression of feelings to determine what goes into teaching and learning of Jewelry in both formal and informal sector (DeWalt & DeWalt 2002). The researchers adopted *sequential* mixed analysis (Tashakkori & Teddlie 1998). In doing so, the qualitative data were analyzed to generate codes and themes with the aid of Hyper Research software. The qualitative data analysis was followed with quantitative data analysis with the assistance of SPSS (Onwuegbuzie 2003).

Because the number of students involved in the study was not too large to deal with, the researchers used descriptive statistics rather than inferential statistics to analyzed was the quantitative data. Descriptive statistics here refers to the use of some basic features of data in a study to describe the general tendencies such as percentage, mean, median and mode in the data (Trochim 2006). The researchers adopted Walk's (1998) comparative analysis theory to ensure the achievement of a sequential and scientific comparative analysis. According to Walk, for any study to be considered as a comparative study, the researchers must spell out the following principal elements:

a) The Frame of Reference for the Study

The characteristics of School-Based and Apprenticeship programmes of Jewelry Education in Ghana that were identified and described by the researchers created the basis that constituted the analytic framework for the cross-case comparison.

b) Grounds for Comparative Analysis

The basis for comparing Jewelry Education by school-based and apprenticeship programmes stemmed from the fact that they are the only institutions that one can be trained to become jeweler in Ghana. The cases (School-Based and Apprenticeship) used are terminal points of education Ghana. Meaning anyone who goes through education (formal and informal) to that level is expected to enter into the world of work.

c) Thesis for the Comparative Analysis

Based on the findings of the unique features of School-Based and Apprenticeship programmes of Jewelry Education in Ghana, the researchers established the eight specific subject areas (themes) as the theses. They include:

- Background of Jewelry Teachers and Learners
- Jewelry Learners' Enrolment Processes
- Subject Matter and Duration for Jewelry training
- Methods of Teaching and Learning of Jewelry
- Challenges that Confront Effective Teaching and Learning of Jewelry

d) Organizational Scheme for the Comparison

Among the two basic schemes which researchers can organize a comparative analysis are a point-by-point and a text-by-text of which the research found the former more appropriate for the study. By point-by-point scheme, the researchers alternated the discussion of the themes. Here the various subject areas as stated under thesis for the comparative analysis were deliberated on, and the same aspects in the Apprenticeship programme was also discussed. The use of point-by-point as against text-by-text is that the former allowed for the same subject matter of the two (cases) in the same paragraph, one point at a time. However, the use of point-by-point scheme made the presentation of issues a bit back and forth.

e) The Linkage between School-Based and Apprenticeship programmes of Jewelry Education in Ghana

A study of this nature became imperative to draw a link between the cases (School-based and Apprenticeship programmes of Jewelry Education). Failure to do that on the part of the researchers would have posed the challenge of coming up with logical and systematic variables that will create the needed similarities and differences contained in the cases which were studied.

The linkage of the two cases is that people who graduate from School-Based and Apprenticeship programmes of jewelry education (training) enter into the same jewelry industry (job market) and practice their profession as Jewelers for a living.

IV. Results

a) School-Based Jewelry Programme in Ghana

Characteristics of Jewelry Teachers and Learners

The study revealed that teaching staff of MPD section is 6, comprising 5 Males and 1 Female. Five (5) of them hold the position of lecturers and a Senior Lecturer. Their academic qualifications include one Ph.D (African Art and Culture), one MPhil (Art Education), two MFA (Jewelry and Metalsmithing) and two MA (Art Education). Also, the number of years they have been teaching spanned between 10 to 17 years for three lecturers, and the other three have also taught between 5 to 9 years. Meanwhile, 50% of them have practiced as Jewelers for more than 20 years while the other 50% have also practiced Jewelry for about ten years.

On the hand, the characteristics (Table 1) of students were made up of 78 undergraduates comprising 84.6% males and 15.4% females of which 2.8% are aged 16-18 years, 42.1% falling within the ages of 19-21, while the majority (57.8%) of were aged 22 years and above. Table 2 shows the class levels distribution of gender and ages of the respondents. People choose career paths based on certain instincts. On that score, the researchers enquired from the students what propelled them to study jewelry. The results as shown in Figure 1 revealed that 30.8% of the respondents decided to study Jewelry because of the careers that is associated with it. Another 30.8% said their decision to pursue Jewelry is based on the fact that the programme provides a good foundation for further education.

Besides these two reasons, there were those (14.1%) who said their previous examination grades prevented them from pursuing their preferred programme; hence, they had no option than to opt for the Jewelry programme. Furthermore, 12.9% argued that their former teachers encouraged them to enroll to pursue jewelry. Notwithstanding 2.5% and 3.8% claimed that it was their parents and friends that advised them to pursue, whereas 5.1% did not respond.

b) Enrolment Process

The responses by all the lecturers show that to enroll on Jewelry programme, the prospective students must first meet the admission requirements set by KNUST. For example, a minimum of grade C6 in six (3 Core and 3 Elective) subjects from the West African Senior Secondary Certificate Examination (WASCE). After admitting the person s/he has to pursue one-year Department of Industrial Art Foundation course and hi/her average mark in IAM Metal Product Design I and II courses should be above 67%.

c) Teaching and Learning Processes

Four out of the six lecturers stated that they start teaching jewelry by first introducing the students to the

theoretical background of the intended jewelry project and the various techniques and tools require for its execution. The students are then asked to read on the topic to gather other people's views and perception about the project so that it will not be only student's view or the lecturer that they rely on to do the work. One lecturer (L3) said "the processes of teaching and learning of jewelry is a three-stage which include Design, Modelling and Fabrication procedure which require approval from the lecturer after every stage of the processes."

Five of the lecturers indicated that students' do between 3 and 5 practical works (jewelry items) in a semester. Also, one lecturer said his students do one major jewelry project work every semester. Notwithstanding, the researchers noticed that availability or otherwise of tools, equipment, and materials determine the number of jewelry items that the students produce within the semester. The study also recognized that due to the expensive nature of some of the materials for jewelry practical, the lecturers sometimes become a bit flexible in demanding certain materials from students. For instance, L5 professed that in times where there is a scarcity of a particular material, he allows the students to use alternative.

On the same issue the majority of the students agreed with their lecturers' assertion that they undertake between 3 and five jewelry items in a semester as Figure 2 shows.

d) Challenges Confronting Effective Learning of Jewelry by Students of MPD Section

The researcher enquired from the respondents if they have resources like jewelry books and facilities for learning jewelry. The results of the study show that only 7.7% of the respondents own Jewelry Textbook, but 80.8% do not have any jewelry books while 11.5% were unable to give responses. One useful resource required by students to learn Jewelry is the ability to get regular access to materials. The result shows that the university is supposed to give materials to students for their practical works but this is not done presently as 57 out of 78 respondents confirmed the assertions by the lecturers that students buy their own materials for teaching and learning jewelry practical, while 2 of out 78 respondents said it is the department that provides materials for their activities. Meanwhile, 19 out of the 78 respondents could not indicate the source.

The next problem that was brought forth by the students was the improvement of facilities for teaching and learning. According to 70% of the respondents, authorities should endeavor to provide the school with the state-of-the-art tools and equipment as well as materials for their training. Another challenge the researchers identified were lack of Field Trip and Industrial Attachment. The study shows that 65 (83.3%) said they had not gone on any attachment while only 9 (11.5%) indicated that they had had some attachment and 4 (5.2%) had no response. Comparatively, 89% stipulated that they have not embarked on a field trip before with 6% declining any response.5% responded in the affirmative, whereas

e) Apprenticeship in Jewelry Programme in Ghana

The features (Table 2) of the people who were interviewed by the researcher are described as 4 Master Jewelers and 15 apprentice jewelers. All the interviewees were males. The ages of the Master Jewelers were 61, 42, 35 and 34 years respectively. Each of the MJs has his own jewelry business that is registered. All the 4 Master Jewelers have accumulated a wealth of experience as practicing Jewelers. Table 4.8 shows the other characteristics of the interviewed. master jewelers. Two (2) which is 50% of the MJs' had their jewelry training through apprenticeship programme while the other two had theirs through School-Based. The experiences gathered so far by the respondents as practicing jeweler range from 5 years to 27 years.

Collectively, all of them have trained 47 Jewelers and are currently having 24 apprentice jewelers. The characteristics of the apprentice jeweler are made of 15 males with their ages ranged between 21 and 27 years. The educational background of 7 AJs representing 46.6% had completed Junior High School. Again 26.7% signifying had completed either Senior High School or Technical School. Meanwhile, 13.3% were tertiary graduates with 13.4% not formally educated. At the time of the study, the apprentices had spent between 6 months and five years in their training.

f) Enrolment and Induction of apprentice in Jewelry Apprenticeship Programme

The study revealed that the process of enrolling people in the Jewelry Apprenticeship programme is categorized into two forms. These were traditional and non-formal methods. The first category involves is made of a relative, either an uncle's son or auntie's son or any other member of the MJ's family is brought to him for training. According to 3 of the MJ that were interviewed, almost 80% of all the people who have enrolled as apprentice jewelers in the past and currently are people who in one way or the other have a relationship with their family. Citing an example, MJ3 said:

If you are a carpenter by the roadside nobody will come until somebody who knows your character brings his/her son to stay with you because he is coming to copy everything about you but anything short of that the parents will not bring their son to you for training.

However, the other Master Jeweler said he enroll people through a non-formal method where the gardian of the prospective trainee fills and submits Jewelry Apprenticeship application form and then go

through an interview before s/he is enrolled. It emerged from the study that the process of enrolment in jewelry apprentice programme through the traditional method is not complete until the induction of the prospective apprentice takes place. The some of the activities that take place on the day of the induction ceremony are payment of fees and signing the apprenticeship agreement by the two parties (the Master Jeweler on one side and the parents and the prospective apprentice). The payment schedule of the fees is such that whatever the apprentice pays on the day of induction, doubled is paid during his/ her graduation. The items that the MJ demands from the prospective apprentice jeweler includes: Two bottles each of Whiskey and Schnapps, a Crate of Beer, 2 Fowls (a cock and a hen), a packet of cigarettes, and a specified amount of money. The amount of money paid is usually determined based on the family relation an apprentice has with the Master Jeweler.

Once the master accepts the apprentice, he provides him with accommodation, clothing, food and even pocket money. But as soon as the trainees learn and s/he can produce sellable jewellery, the MJ uses the proceeds to defray the deferred apprenticeship fees. Such apprentices are made to stay with their master for some time after their training.

g) Method of Teaching and Learning in Jewelry Apprenticeship Programme

The outcome of the study as three of the Master Jewelers indicated that teaching in Jewelry Apprenticeship programme is not structured. In describing the teaching process in jewelry apprenticeship in Ghana, MJ1 said "it is a seamless way of learning, there is no syllabus, there is no break, nothing, there is nothing like holidays. Anytime the workshop is opened the person is there until the period".

Again, the study was revealed that actual teaching of an apprentice jeweler does not begin immediately after the initiation ceremony, instead, he/she is made to go to work for three months without being taught how to use the tools and equipment. This period is considered as a probation period, is used to assess the apprentice's capabilities and readiness for learning. According to all the Master Jewelers, during the probation period, the Apprentice jeweler is made to watch his master whenever he is working (for example, milling wires, melting, pickling, and many more). He is also sometimes sent on errands.

The results of the study as indicated by 12 of the AJ interviewed show that during their probation period their masters exposed them to safety, handling of tools, equipment, and cleaning of the workshop. They were then allocated a workbench and made to start working with silver. The first practical jewelry item that the apprentice jewelers said they learned was chain making.

h) The Subject Matter and Duration of Jewelry Apprenticeship Programme

It was identified by the researchers from the responses of all the Master Jewelers that demands of the jewellery market determine the content (things that they teach and learn) of the jewelry apprenticeship is usually by the. For example, MJ2 said when he is commissioned to produce Curb-chain then that type of item is what the apprentice will be learn at that moment.

Three of the MJs said that an apprentice jeweler requires four years on-the-job training to become a qualified Bench Jeweler, while one MJ said those who come to him for training spend three years. It also emerged from the observation that the actual time spent by an apprentice jeweler to undergo training depends on the effort of the apprentice. According to one apprentice jeweler he was billed to undergo the training for 3 years, but as at the time the researchers conducting the interview, he had spent four years and still does not know when he was going to graduate from his training.

Concerning the hours that an apprentice jeweler spends at the shop each day, 11 of the apprentices said they report to work by 7:00 am and closes at 6:00 pm from Monday to Friday, except on Saturday that they close at 12:00 pm.

i) Challenges that affect Jewelry Apprenticeship Programme

The responses from the 4 MJs and the 15 AJs highlighted two challenges which in a way, affect the apprenticeship in Jewelry programme in Ghana. The foremost among them was the lack of Jewelry Policy and regulator. Expressing his dismay about unavailability of policy and regulator for the Jewelry sector MJ1 who has been practicing jewelry for more than two and half decades opined that "the Government of Ghana hasn't gotten any fine policy so far as the jewelry industry is concerned, which makes the industry not regulated as it exists in other vocations". He cited an example of dressmakers and beauticians' associations that regulate and supervise the activities of their members in their business operations and apprenticeship programme.

The second problem that arose from the study that was expressed by all the 4 MJs and 10 AJS is access to materials. All the Master Jewelers indicated that if the MJ is unable to have access or buy materials at a reasonable price, then giving some to the apprentices for learning become very difficult. Eight of the Apprentice Jewelers supported this assertion.

V. Discussions

a) Background of Jewelry Teachers and Learners

The demographic feature of lecturers of jewelry programme suggests that their professional competencies as teachers and jewelers place them in a position that makes them capable of teaching students to become jewelers. Comparatively, the experiences that the Master Jewelers have gathered as practicing jewelers and trainers can also march up to that of lecturers when it comes to transfer skills of jewelry making to people. Because both lecturers and Master Jewelers are in the Establishment Stage of their careers in jewelry as Super, Savickas, and Super (1996) state. According to them when an individual practice in a field of his/her specialty from a period of 6 to 10 years, such a person is said to be in his/her Career Establishment Stage (CER).

The trainees of jewelry on the other hand also have some common characteristics. For instance, the estimated mean age of the student happened is 21.6 years which is in line with that of the Apprentice Jewelers which was found to be 21 years. Kanfer and Ackerman (2004) have it that the ages of trainees have effects on the factors that motivate them to pursue a programme that results in better learning outcomes. The findings of the study where the majority of the students and the apprentice indicated that they decided to study Jewelry because of the careers it brings, reflect Kanfer and Ackerman's opinion. The assertion of the students may be true to some extent.

As for the apprentice the career path is limited to jewelry while that of the students go beyond jewelry. This confirms an observation by Koni, Zainal, and Ibrahim (2012). To them, it is not always that students who enroll in university programmes have the penchant for acquiring a degree in their area of study. The views expressed by Koni et. all (2012), may account for many School-Based Jewelry graduates not practicing as jewelers after their training. It also supports the point made by Ramirez and Dizon (2014) that some students who enter Higher Education sometimes pursue programmes that is different from the kind of vocation they practice in the future.

b) Jewelry Learners' Enrolment Processes

Enrolment of students on the Jewelry programme in Ghana requires the prospective students to meet certain academic requirements and does not need to be a relation to the Lecturers. Conversely, the widely used process of enrolling into jewelry education through the apprenticeship programme referred to by the researchers as Only Relation Enrolment Method (OREM). The process used in enrolling apprentice jewelers replicates and supports a similar claim by Palmer's (2009) study. The researchers however, reject the claim by Kotoku (2009) that the jewelry trade is sacred and therefore its operating system and information are not allowed to be shared with outsiders which is the basis for accepting only family members as apprentice jewelers. The researchers are of the view that the Master Jewelers deliberately do that to keep others away from the jewelry trade to keep the fortunes within the family.

c) Subject Matter and Duration for Jewelry Training

The school-based training has a well-structured system of what is to be taught and learned which is known as curriculum. Callahan (2000) was of the view that the heart of any educational activity is the curriculum and instruction that accompanies it. These two resources make it possible for instructors and learners foreknow what they are to do to become jewelers after school. The observation of the researchers reflects Mouzakitisa (2010), who states that curriculum in vocational programme (such as Jewelry) is the passageway that leads to the training of professional knowledge and skills that enable the drift from concept (theory) to hands-on. When the curriculum of the school-based jewelry education was examined, the researchers noticed that the jewelry curricula have the ability to generate all the six outcomes expected that exist in every vocational education programme; namely routine expertise, resourcefulness, functional literacy, craftsmanship, business-like attitudes and skills (Lucas & Claxton 2010). However, the contents of the courses are overloaded.

Distinctively, the results of the study reveal that the subject matter (content) of Jewelry Apprenticeship programme is not structured because it lacks clarity and defined methodologies. In other words, the process of teaching apprentice jewelers does not include curriculum that requires a conscious way of taking the apprentice to the classroom for him learn how to make jewelry. At best the Jewelry Apprenticeship programme can be described as a seamless way of teaching and learning of Jewelry where there is no syllabus and no timetable that guide it.

Meanwhile, the expected outcome for Jewelry education by apprenticeship is the same as that of vocational education except of functional literacy. Students have four years to complete jewelry education once s/he passes all his exams. On the other hand, the duration for training as a Jeweler through apprenticeship is between three and four years, but the actual time spent by apprentice jeweler to graduate depends on his effort and how quickly he learns.

Lack of specific structure for the content of the jewelry apprenticeship causes gaps within the flow of the training process. But if what the MJs teaches is organized well then, the apprentice will be made to progress in his learning by going through simple jewelry making techniques at the initial stages while s/he

undertakes more in-depth and broader aspects of the discipline as he advances in training.

d) Methods of Teaching and Learning of Jewelry

For a student to go through jewelry training to become a practicing jeweler, the person has to go through rigorous hands-on training throughout the person's entire period of training. As the study revealed, teaching and learning methods used by lecturers and students conformed to the tried and tested vocational pedagogy which blend hands-on or first-hand learning with in-depth reflection, teamwork, and feedback in a situation where teacher and the content of what he/she teaches has a strong affiliation. The lecturers adopt direct teaching methods which are particularly in helping students to acquire skills. This method of teaching has a well-structured approach that includes the teacher instigating direct interactions usually with the whole class but sometimes with an individual or a small group of students. Other methods that the lecturers use include Lecturing, Modeling, Demonstration, Mastery learning, Simulation and Coaching (Faraday, Overton & Cooper, 2011).

Students pursuing jewelry in school engaged in an active learning process, enquiry learning and exploration. Every jewelry item that the students learn has to go through three stages. The first among them is designing (concept development), the second is modeling and final is a fabrication. Students also use interactive experimentations, simulations and role play methods. Disharmonious to the School-Based Jewelry programme is the methods used by Master Jewelers to teach apprentice jewelers which largely depend on the skillfulness of the MJ and the efficiency of the facilities and techniques that he uses to transfer the skills. The finding clearly supports the study of Anokye and Afrane (2014) that state, apprenticeship training is an art that depends on the level of expertise of the MJ and the methodologies he/she uses to handover the knowledge and skills to the apprentice, which at the end establish the type of Craftsman he/she produces.

The learning process also involves a lot of repetition of the same job several times, a process known as Observational Learning. The learning processes in an apprenticeship in jewelry is likened to Bandura's (1977) Social Theory of learning where all the four components (attentional, retention, reproduction and motivation) are present. As the study shown, the apprentice jeweler begins his Jewelry learning by watching and paying attention to what the master does. His next step in the learning process is to make sure he retains the procedures and methods employed by his master. He then puts into practice by reproducing what he saw his master do. When he is able to make the item with little instruction from his master, he gets the opportunity to watch more activities that the MJ does which motivates him to reproduce more of the jewelry made by the MJ.

Once more, the School-Based Jewelry has high lecturer to student ratio (average of 1:27), while that of Master Apprenticeship is low (1:5). In situation the where there is a high trainer to trainee ratio it becomes difficult for trainers to monitor trainees' behavior as well as maintaining high learners' attention rate.

e) Challenges that Confront Effective Teaching and Learning of Jewelry

The finding of the study that indicates the lack of jewelry policy and regulators in the Jewelry Apprenticeship programmes is a contributing factor of some Master and Apprentice Jewelers exploiting the apprenticeship system. This finding confirms to a similar claim made by Palmer (2009), who states that lack of a regulatory framework for apprenticeship training in Ghana usually leads to the exploitation of the apprenticeship by Master Craftsmen and apprentices. In the same manner, Anokye and Afrane (2014) also opine that some MC deliberately refuse to teach the apprentices what they are supposed to know for them to become effective Master Craftsmen. However, the researchers disagree with Kotoku's (2009) claim that the lack of regulator in Jewelry Apprenticeship results in some apprentice stealing the gold of their masters to do their jobs to supplement their earnings. Because during the induction of the apprentice jeweler the curses that the master calls upon to befall the apprentice if he should steal from the master put fears in the apprentice to even dare. So, if any apprentice Jeweler takes pilfers from his master that may be the character of that person but not because the system does not have policy or regulator.

On the contrary, policy regulation is not an issue to the school-based programme as the findings shows. Unfortunately, school-based jewelry education also has its own constrains. Among them is getting materials and facilities for teaching and learning. The mode of organizing resources for students to undertake Jewelry practical replicates and lend further support to Opoku-Asare, Agbenatoe and deGraft-Johnson (2014) who state:

When it comes to materials for students to use in undertaking GKA practical levying the students and using the monies to purchase the required items every term. In this case, only students who pay are given the items they need for practical assignments for the term. (p.125)

The implication of students acquiring their materials for practical lessons translates into a low number of jewelry items that the students produce in a semester.

Industrial attachment and Field trips are valuable educational exercises that help to strengthen

the understanding of concepts that are taught and learned in school. However, the findings of the study that revealed the majority of the students (85% and 89%) have neither been on an attachment nor a field trip. This finding goes contrarily to what has been stated in their curriculum. According to the narrations, the MPD section organizes field trip/educational trips for students from which they present reports for assessments. Meanwhile, Hurwitz and Day (2001) are with the view that field trips for art students usually helps them to experience an original work of art of a high quality that could serve as a form of reference for understanding what the slides or prints they see in school represent. On the contrary, fieldtrips and attachments are not a requirement in Apprenticeship Jewelry Education in Ghana. The challenge with the Jewelry Apprenticeship programme is a policy that regulates the training.

VI. Conclusions

The study conducted a Comparative Analysis where the similarities and differences between the School-Based and Apprenticeship programmes of Jewelry Education in Ghana were established. Based on the findings obtained the researchers conclude that: The school-based jewelry education in Ghana has a structured system which makes teaching and learning sequential. Starting from enrolment, prospective students have to meet minimum requirement based on their results of West Africa Senior High Certificate Examination (WASSCE). This process gives the opportunity for everyone who meets the requirements without any restrictions to the prospective jewelry students. However, jewelry training through the apprenticeship programme does not have organized scheme for training apprentice jewelers instead what they learn is driven by contracts that the master jeweler receives, making training non-sequential. Also, enrolment is largely based on the family relationship that the prospective apprentice jeweler has with the Master Jeweler, which makes the enrolment process very restrictive.

The school-based system usually lacks relevant teaching and learning facilities and materials. This result in concentrating on theory instead of practical. But the apprentice jewelers do not have issues with facilities and material as the master them, making their entire training practical-based. There is high lecturer/student ratio (average of 1:27) in the school-based system, whereas those in the apprenticeship system haw low trainer/trainee ratio (1:5). The performance of learners in the school-based system can be tracked because, it has well-structured criteria for assessment, which is not the case with Jewelry Apprenticeship. Apprentice jewelers spend less time working since they go on errands for the Master Jeweler, seniors and sometimes the wife of their master.

The comparative analysis of School-Based and Apprenticeship of programmes Jewelry Education in Ghana has brought up the good practices in their training system. The researchers recommend that models for jewelry education should be developed by in cooperating in each programme good practices each system of jewelry education. Further research in comparing and contrasting teachers and learners of other skills-oriented in Ghana so that those who learn vocation through school and those who learn same through apprenticeship can end up in the same industry which will boost employment and economic development of Ghana.

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Table 1: Characteristics of Students

Respondents (Students' Level)	Gender		Age (years)		
	Male	Female	16-18	19-21	Above 22
2nd Year	22	8	2	11	17
3rd Year	14	3	-	13	4
4th Year	30	1	-	9	22
Total	66	12	2	33	43

Table 2: Background information of Master Jewelers

Respondents	Education Level	Age	Mode of Training	Years of Practicing Jewelry	Jewelers Trained	Apprentice
MJ1	BA Art	61	School-Based	27	36	8
MJ2	HND Jewelry	35	School-based	8	3	4
MJ3	JSS	34	Apprenticeship	13	6	5
MJ4	SSS	42	Apprenticeship	5	2	7

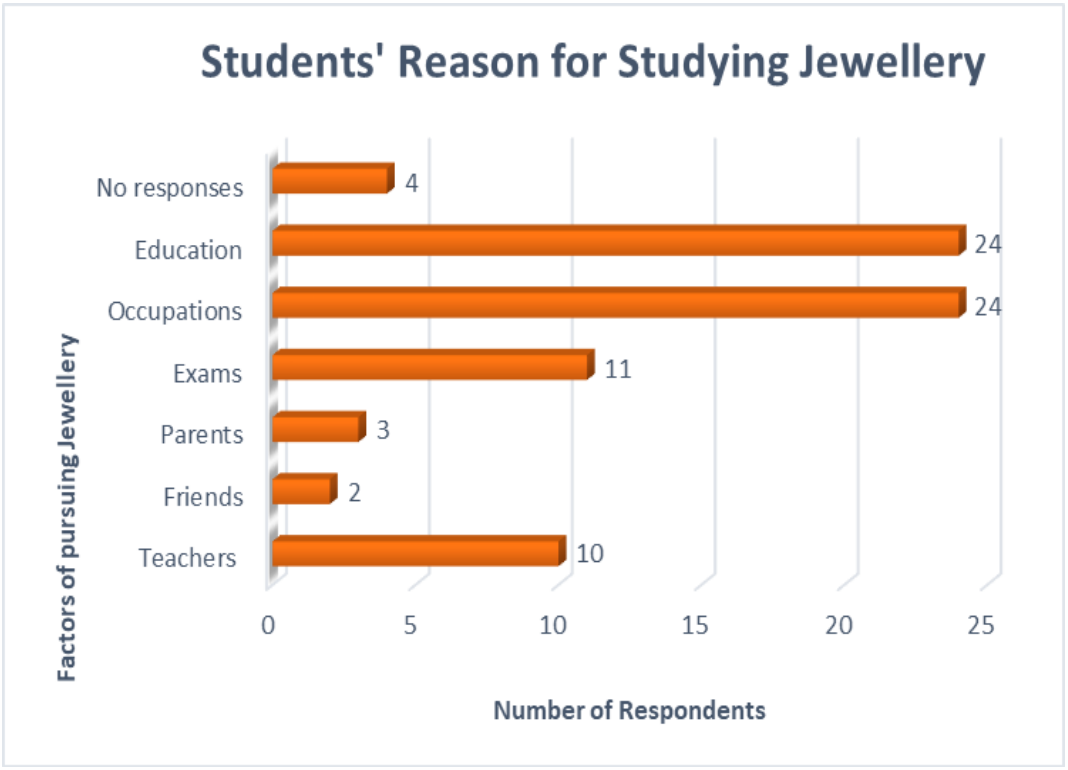

Figure 1: Factors that influence students' pursuit of Jewelry.

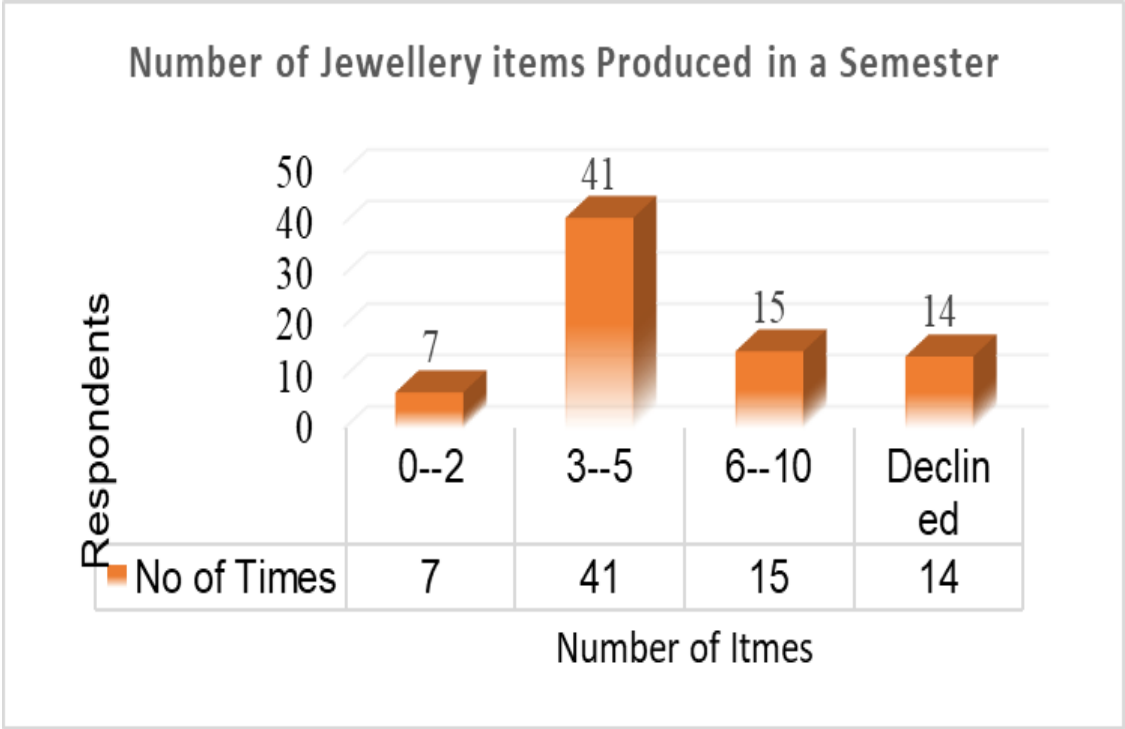

Figure 2: Student's view on number of practical they do at MPD section.

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The Relationship between Student-Teachers Interaction and Academic Achievement of Trainee Teachers in Dilla College of Teacher Education

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Abstract- This study was designed to investigate the relationship between selected psychosocial variables and academic achievement. Emphasis was made on establishing the relationship between student-teachers interaction and academic performance of college students at Dilla College of teachers' education. The study employed the use of correlation design to establish the nature of the relationships. The validity and reliability of research instruments was established and data was collected from 246 respondents selected from all streams in the college using simple random sampling method. To analyze the data, the analysis of variance (ANOVA), T-Test, Multiple regressions (MR) and Pearson product moment correlation statistical tools were used with the aim of establishing the difference and relationship between student-teachers interaction and academic performance of college trainee teachers at Dilla College of Teachers' Education. Findings revealed that there was significant difference in academic performance on students of different age, no significant difference in academic achievement of students from different parental occupation level, no significant difference in parental education level and place of residence.

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Bereket Merkine[α], Yohannes Bisa[σ] & Aklilu Ayele[ρ]

Abstract- This study was designed to investigate the relationship between selected psychosocial variables and academic achievement. Emphasis was made on establishing the relationship between student-teachers interaction and academic performance of college students at Dilla College of teachers' education. The study employed the use of correlation design to establish the nature of the relationships. The validity and reliability of research instruments was established and data was collected from 246 respondents selected from all streams in the college using simple random sampling method. To analyze the data, the analysis of variance (ANOVA), T-Test, Multiple regressions (MR) and Pearson product moment correlation statistical tools were used with the aim of establishing the difference and relationship between student-teachers interaction and academic performance of college trainee teachers at Dilla College of Teachers' Education. Findings revealed that there was significant difference in academic performance on students of different age, no significant difference in academic achievement of students from different parental occupation level, no significant difference in parental education level and place of residence. The findings also revealed that there was significant positive relationship between student-teachers interaction and academic performance. Based on the findings, the researcher made the following conclusions; Affection, advice and overall interaction of teachers do count on motivating students to read, attend and interact with high commitment. The researcher also confirmed the ecological and social learning theoretical model. Finally, the researcher recommended that; Dilla College of teacher education maintains its instruction by considering the influence of student teacher interaction.

I. Introduction

Learning in a classroom depends on a great deal of the structure and patterns of inter-personal relationships particularly pupil-pupil relationship, existing at a given point of time within the learning group. The transition from high school to tertiary institution of learning is a major life change and time of facing many psycho-social problems like peer pressure, different interpersonal relationship living far from parents and facing new environment for many youth. Attending education in tertiary institution offers students with learning experiences and opportunities for psychosocial development (Friedlander, Reid, Shupak, & Cribbie, 2007; Tao, Dong, Pratt, Hunsberger, & Pancer, 2000). However, entering the institution of higher learning may be a source of strain and an acute stressor (Friedlander et al., 2007). At the colleges and universities, academic demands increase and new social relations are established. However, students are often not sure of their abilities to cope with these demands (Dwyer & Cummings, 2001). According to research conducted by Jill Carlivati (2001) college performance correlates with quality of one's interpersonal relationships and additional developmental outcomes. Academic failure, as assessed by the frequency of problems with peers and difficulty with school work, has a great impact on relationships in the home, as students who have had a bad day at school are more likely to display aversive behavior towards their parents that evening (Repetti, 1996)

Education competence in the present world is interwoven with the progress of every society. According to the modern concept of education, cited in Deepa and Chamendeswari (2014) best adjustment of school climate, parental involvement, peer interaction and student teacher interaction is the ultimate goal of education.

Student's characteristics like motivation, learning styles and study habit, gender, and learning strategies played a very important role in academic achievement as cited in (Osher et.al, 2008). Abe (1995) noted that it is possible to perceive the totality of human as being guided and ruled by psychological and social variables. Onocha (1985) also avers that the modern man as a person has his educational aspiration and accomplishments projected by the psycho-social variables in the environment, the positions of these two sets of variables are unique and important and may be appreciated when it is realized that the variables are necessary for the understanding of human beings, their overt and covert behaviors', potentialities and

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performances in the three areas of educational domains (cognitive, affective and psychomotor).

All psycho-social factors are important variables that affect students' academic achievement and need investigation so as to bring students effectiveness in college of education and reach country development as planned. But the researcher would like to investigate the relationship between selected psycho-social factor that is student –teacher interaction and academic achievement of trainee teachers in Dilla College of teacher education by taking psycho-social factors as independent variable and academic achievement as dependant variable.

II. Statement of the Problem

Student success is at the heart of the educational enterprise. College success helps students to meet long-term personal and career goals and provides a range of monetary, psychosocial, and physical benefits (Baum & Ma, 2007). The research studies revealed that various psycho-social factors are responsible for scholastic failure of students, such as low socio-economic background, student's psycho-social factors, cognitive abilities, school related factors, environment of the home, or the support given by the parents and other family members (Khan & Malik, 1999; Fan, 2001; Gonzalez- Pienda, Nunez, Gonzalez-Pumariega, Alvarez, Roces and Garcia, 2002).

The alarming rate of low academic self-efficacy and eventual low academic achievement constitutes a great concern to parents, teachers, examination bodies, counselors, psychologists and colleges.Indeed, it represents a great wastage on the parts of students, parents and the government.

Parents, adult family members, teachers and peer groups contribute significantly to various components of personality of the students particularly in improving his/her academic performance Considine and Zappala (2002. The data from Dilla College of teacher education registrar show that, most students academic achievement are very low which is below average grade of the college. The researcher would therefore like to investigate the relationship between selected psycho-social variable and academic performance of College trainee teachersat Dilla College of teacher education with specific reference to teacher-student interaction on academic success of trainee teachers.

a. Research Hypotheses

The following hypotheses were planned for the purpose of this research which is investigation of the relationship between selected psycho-social factors and trainee teachers' academic achievement in college of teachers' education.

1. The higher teacher–student interaction, the higher would be college students' academic achievement among trainee.
2. There is significant difference in academic achievement between male and female trainees.
3. There is positive relationship between socio-economic status (parental education, place of residence and parental occupation) and academic achievement of trainee teachers in college of teacher education.

b. Research Questions

This study will answer the following research questions.

1. Is there significant relationship between student-teacher interaction and academic achievement of trainee teachers in college?
2. Is there statistical difference in academic achievement between male and female?
3. What is the relationship between parents' social economic status and academic performance of college students?

c. Objectives of the Study

The study would have the following objectives:

i. *General Objective*

To find out if Psycho-social variable student-teachers interaction affects academic performance of trainee teachers at Dilla College of teacher education.

ii. *Specific Objectives*

1. To examine the relationship between teacher-student interaction and academic achievement of college students.
2. To investigate academic achievement among male and female college students.
3. To examine the relationship between socio-economic status (parental education, place of residence and parental occupation) and academic achievement.

III. Research Methodology

The intention of this research was to assess the relationship between selected psycho-social variables and academic achievement among college students. The gender differences in academic achievement at college level, the level of student-teachers interaction and its relation with academic performance were part of the objectives. In order to achieve this research objective, the researcher decided to obtain the basic information from college students. Accordingly, the planned study area (geographical location), study design, study population, sample size, sampling techniques, methods of data collection, data quality assurance (validity and reliability), methods of data processing and analysis of results are explained in this chapter.

IV. Study Area

The study was conducted at Dilla College of Teacher Education (DCTE). DCTE is located in Dilla city which is about 365 kilometers to the south east of the capital city of Addis Ababa and about 90 kilometers to the west of the capital city of Southern Nation Nationalities and Peoples Region of Ethiopia (SNNPR). DCTE was first established in 1994 as Dilla Agricultural, Vocational and Technical College (DATVC), offering diploma level education in Agricultural fields (DCTE, 2013). In 2005 E.C, the institution was renamed as Dilla College of Teacher Education (DCTE).

V. Research Design

The study was conducted by using the correlation research design as it was intended to investigate the relationship between student-teachers interaction and academic achievement. According to Fraenkel and Wallen (1996), correlation research describes an existing relationship and differences between different dependant and independent variables. The study was conducted in line with quantitative approach for the reason that it is based on variables measured with numbers and the results were analyzed with statistical procedures.

VI. Population of the Study

The target population of the study was all 3rd year Dilla College of Teachers Educationstudents. The number of 3rd year college studentswas681, where 553 were males and 128 females. The respondents in this study were college students as itwas about assessing the relationship between selected psycho-social factors and academic performance of college students at Dilla College of teachers' education.

VII. Sample Size and Sampling Technique

According to Anthony and Picciano(2011, p121) various sampling techniques can be used depending up on the type of research to be conducted. The selection of the sample for this study made as follows: First, by using purposive sampling technique, 3rd year students taken for the reason it was intended to investigate the relationship between student-teacher interaction and academic achievement based on *Cumulative Grade-Point-Averages (CGPAs) in last five semesters.* Following this, they were further stratified based on stream and gender (sex) the reason that the number of female trainees in the college significantly lesser than that of male trainees in number and the number of students in each streams were not equal. The sample of the study was 248 3rd year students that the researcher selectedout of681 students based on Morgan and Krejcie's 1970 sampling determination table. The sampling determination table developed by Morgan and Krejcie is suitable to select sample from population based on its clearness which many researchers were used and confirmed its validity (Kyoshaba, 2009). In the process, the 681(553 male and 128 are female) third year students in the college and were divided into four streams. The 248 respondents were selected from all streams in the college of education by using the sampling table. Finally as randomization is effective in creating equivalent representative groups that are essentially the same on all relevant variables (Amin, 2005), the sample was done by using simple random sampling techniques which is procedure of lottery method to select participants from each stream so as to avoid bias andgive equal chance for whole 3rd year college students (see table 1).

Table 1: Sampling Frame for Sampling Techniques

Streams	Dep't	Male	Female	Total	Overall	Sample		
						M	F	Total
Social Science	Geography	36(13)	3(1)	39(14)	218	64	15	79
	History	36(13)	7(3)	43(16)				
	Civics	77(28)	16(6)	93(34)				
	Social studies	27(10)	16(6)	43(16)				
Math's and Natural Science	Math's	62(23)	8(3)	70(26)	232	75	10	85
	Biology	46(17)	5(2)	51(19)				
	Chemistry	40(15)	4(1)	44(16)				
	Physics	28(10)	0	28(10)				
	Math's and Natural Science cluster	29(10)	10(4)	39(14)				
Language	English	69(25)	12(4)	81(29)	188	49	19	68
	Amharic	28(10)	15(5)	43(15)				
	Language	39(14)	25(9)	64(23)				
Aesthetics	HPE	36(13)	7(3)	43(16)	43	13	3	16
Total	13	553(201)	128(47)	681(248)	681	201	47	248

NB. The number of students under brackets indicates the sample from each department

VIII. Data Collection Instruments

The researcher used questionnaire as the population of the study was literate and large. To gather enough information to this study the researcher used Questionnaire containingtwosets of items. The first set consists of questions demandedrespondents background characteristics(i.e., demographicvariables). It includes age, sex, cumulative grade point average (CGPA), department, family structure, parents or guardians Residence, parental educational level, and parental occupation. The remaining one sets of item isstudent-teachers relation scale (STRS).

IX. Student-Teachers Relation Scale (STRS)

Items desired to measure teacher-student interaction (STRS) are 28 in number which is developed by Robert C. Piñata (1999). It is useful for the purpose of this research which dealt with the relationship between teacher-student interaction and students' academic achievement.

Pilot Test

In order to assure data quality, high emphasis were given to minimize errors using the following strategies: First, the instruments were checked by three college language lecturers and the university advisors of the study to judge the items on their appropriateness of content and the language being used and to determine all the possible areas that needs modification so as to achieve the objectives of the study. Accordingly, one pre designed item was omitted from the questionnaire based on its reliability level to insure the content validity of the instruments as supported by Fraenkel and Warren (2000). Secondly, the questionnaire was pretested (pilot test) to insure its reliability. Responses to the instrument include clarity of directions; clarity of questions; relevancy of the question as an important aspect of a major issue; and narrowness or constraint of response.

Accordingly, after the pilot test was conducted, some contents of the questionnaires were modified based on its relevance's to gather the information. Finally, the pilot test data were reviewed checked and relevance of the questions in the questionnaire was evaluated for completeness. Subsequent correction and modification was done according to the feedback from the pilot test. Finally, the pretested data results were analyzed by using SPSS version 16 to see Cronbach's Alpha results for its reliability. Accordingly, the results showed that Cronbach's alpha = 0.845 for student-teachers interaction, which indicates a high level of internal consistency (reliability) for the items to be used as supported by Moskal, B.M., and Leydens, J.A. (2000) (see table 2 for reliability statistics and see appendix D for item statistics).

Table 2: Reliability Statistics for Data Collection Instruments

	Cronbach's alpha	Mean	Variance	SD	Number of items	Number of respondents
Student-teachers interaction(STRS)	.845	93.10	163.66	12.79	28	10

X. Data Analysis Technique

The data gathered through, questionnaire was processed through concurrent flows of activity of the quantitative data analysis system. Data from questionnaires was compiled, sorted, edited, classified and coded into a coding sheet and analyzed using a computerized data analysis package known as Statistical Package for Social Science 16.0 by using revert scale. The researcher used Pearson product-moment correlation coefficient (r) to compute the relationship among student-teacher interaction and academic performance. The researcher also used T-testto find out how academic performance varied with gender, place of residence, parental education, in terms of level of exposure to see the mean difference in the level of their teacher interaction. One way Analysis of Variance (ANOVA) was used to check academic achievement differences in terms of age and parental occupation. Standard Multiple Regression (MR) was also used to predict the academic performance of the students based on selected variabletaken as psychosocial variables and the prediction level of the independent variable for the dependant variable.

XI. Results

a) Demographic characteristics of the respondents

As per section A of the questionnaire the demographic characteristics (i.e., expressed by frequencies and percentages) of the study sample are displayed in Table 3 below.

Table 3: Respondents Demographic Characteristics

Respondents Demographic Characteristics		Sex		Overall
		Male	Female	
Parental education	No formal education	60 (24.41)	14(5.7)	74(30.1%)
	Primary /junior secondary	81(32.96)	19(7.73)	100(40.7%)
	Senior secondary	18(7.3)	4(1.6)	22(8.9%)
	Certificate/ diploma	19(7.7)	4(1.6)	23(9.3%)
	First degree and above	22(8.96)	5(2.03)	27(11.0%)
	Total	199(80.89)	47(19.11)	246(100%)
Family structure	Intact family	170(69.05)	40(16.25)	210 (85.3%)
	Non intact family	29(11.84)	7(2.86)	36(14.7%)
	Total	199(80.89)	47(19.11)	246(100%)
Parental occupation(Father male /guardian)	Government employee	49(19.93)	11(4.47)	60(24.4%)
	Private	25(10.16)	6(2.44)	31(12.6)
	Other	125(50.80)	30(12.2)	155(63.0%)
	Total	199(80.89)	47(19.11)	246(100%)
Parental occupation (Mother/female guardian)	Government employee	26(10.8)	6(2.5)	32(13.3%)
	Private	8(3.28)	2(0.82)	10(4.1%)
	House wife	165(67.05)	39(15.85)	204(82.9%)
	Total	199(80.89)	47(19.11)	246(100%)
Residence	Rural	101(41.21)	24(9.8)	125(51%)
	Urban	98(39.7)	23(9.31)	121(49%)
	Total	199(80.89)	47(19.11)	246(100%)
Age	Below 18	4(1.62)	1(0.38)	5(2%)
	19-22	158(64.15)	37(15.15)	195(79.3%)
	23-25	37(15.13)	9(3.57)	46(18.7%)
	Total	199(80.9)	47(19.11)	246(100%)

As it can be seen from the Table above, samples of female and male students, the majority of the participants reported that their parents had no formal education and/or had elementary/junior secondary educational level, and majority of the students were reported that their parents were not government employer. According to their report majority of the students' family are categorized under other job (such as farmer, merchant and etc). The majority of participants reported that they were from intact families (i.e., residing with both biological parents). As the table above shows majority of the students or respondents family are reside in rural areas. And when we come to mothers' occupation as majority of the students report shows that their mothers' occupation was house wife and majority of the students were aged between 19-22 years.

b) Respondents Academic Performance in Terms of Gender, Place of Residence and Parental Education

The study was interested in whether academic performance varied in terms of demographic characteristics. Table 4 shows the mean difference between gender, place of residence, parental occupation and academic performance as determined using the independent sample t-test results.

Table 4: Summary of the t-test results for the mean difference between gender, place of residence, parental education and Academic performance

Variables		N	Mean	SD	t	P -value
Gender	Male	199	2.82	0.48	1.875	.062
	Female	47	2.67	0.45		
Place of residence	Rural	125	2.84	0.512	1.795	0.074
	Urban	121	2.73	0.44		
Fathers' education	Illiterate	74	2.82	.486	0.694	0.489
	Literate	172	2.77	.480		
Mothers' education	Illiterate	113	2.76	.492	0.716	0.475
	Literate	133	2.81	.473		

Statistically not significant

An independent sample t- test was conducted to ascertain whether a statistically significant difference exists between academic performance and selected demographic characteristics of respondents which includes gender, place of residence and parental education.

As presented in Table-4, there is no statistically significant difference between academic performance in accordance with gender t (245) = 1.875 which is not significant at α= .05; place of residence t (245) = 1.795 which is not significant at α= .05; fathers education t (245) = .489; which is not significant at α= .05 and mothers education t (245) = .716which is not significant at α= .05. This implies that there is no difference in academic performance in accordance with gender of respondents, place of residence of the respondents and parental education.

c) Variation with Age and variation with parental occupation

The mean difference between age and academic performance was determined by using ANOVA. Table 5 shows a summary of the mean difference between age group and academic performance by using ANOVA.

Table 5: Difference of mean academic performance in accordance with Respondents' age

ANOVA summary					
CGPA	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.665	2	.832	3.673	.027
Within Groups	55.062	243	.227		
Total	56.726	245			

Multiple Comparisons						
(I) Age	(J) Age	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Below 18	19-22	-.52010*	.21559	.044	-1.0285	-.0117
	23-25	-.41091	.22415	.161	-.9395	.1177
19-22	Below 18	.52010*	.21559	.044	.0117	1.0285
	23-25	.10919	.07802	.343	-.0748	.2932
23-25	Below 18	.41091	.22415	.161	-.1177	.9395
	19-22	-.10919	.07802	.343	-.2932	.0748
*. The mean difference is significant at the 0.05 level.						

A one-way between-groups analysis of variance was conducted to explore the impact of age on academic performance, as measured by the cumulative grade point average (CGPA). Subjects were divided into three groups according to their age (Group 1: below 18; Group 2: 19-22; Group 3: 23-25).

There was a statistically significant difference at the $p < .05$ level in CGPA scores for the three age groups [F (2, 246)=3.673, p=.027]. Post-hoc comparisons using the Tukey HSD test indicated that the mean score for Group 1 (M=2.298, SD=.411) was significantly different from Group 2 (M=2.8181, SD=.474). Group 3 (M=2.7089, SD=.488) also differ significantly from Group 1 and2

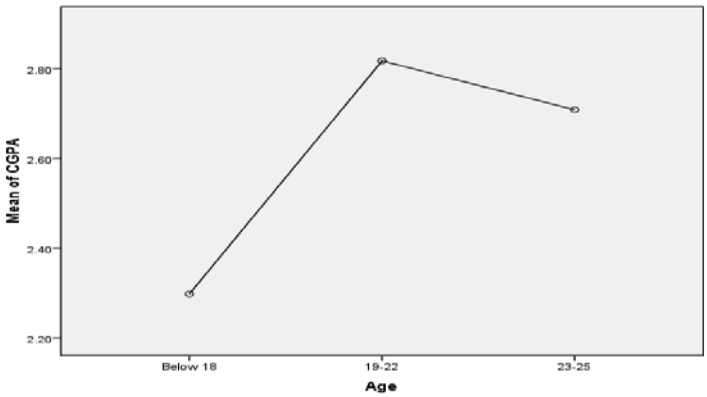

Figure 1: Means plot for impact of age on academic performance

As it can be seen from the above figure of means plot, academic performance is significantly different with different age group of the learners. The figure implies that academic performance (CGPA) is low at age of 18 and below while age groups 19-22 recording the highest.

d) Hypotheses: Students teacher interaction and academic achievement

The hypotheses was stated as; "There is a positive relationship between students-teacher interaction and academic performance of college trainee teachers." To test this hypothesis, the researcher asked respondents to rate their level of interaction with their teachers. The rating was according to Likert scale with one representing strongly disagree, two representing disagree, three representing undecided, four representing agree and five representing strongly agree and the reverse for questions which were negative.

Summary of the Pearson Product Moment correlation analysis for the relationship between student teachers interaction and academic performance

		1	2
CGPA	Pearson correlation	1	0.218**
	Sig(2-tailed)		0.001
	N	246	246
Students-teachers interaction			
	Pearson correlation	0.218**	
	Sig(2-tailed)	0.001	1
	N	246	

**. Correlation is significant at the 0.01 level (2-tailed).

According to the above Table, student-teachers interaction and academic achievement were significantly positively correlated, r (246) = 0.218, p = 0.001 at the 95% of confidence level. This indicates that academic achievement would be significantly positively affected by their level of interaction with their teachers. This result implies that the level of interaction increase or become high, the academic achievement of students increase.

e) Preliminary Multiple Regression Analyses

Preliminary analyses were conducted to ensure no major violations of the assumptions of multicollinearity, normality, linearity, were there. The results indicated that there were no major violations of the assumptions. Pallant (2007, P.155) explains that to check if there is multiple correlations among the predictors, the "*Tolerance and VIF*" values presented in the coefficients table are used. Accordingly, a Tolerance value less than 0.1 or a VIF value greater than 10 indicates multicollinearity. Thus, multicollinearity is not a problem in this study as all the Tolerance values were greater than 0.1 and the VIF values were less than 10. On the other hand, the normal probability plot (P-P) of the standardized residuals and the scatter plot of standardized residuals were used to check whether the normality and linearity assumptions were met. The normal probability plot should indicate points lying in a reasonably straight diagonal line from bottom left to top right. The output from the multiple regression analysis in this study indicated asound linearity of points along the regression line as it indicated in appendix. Furthermore, Pallant also states that residuals should be roughly rectangularly distributed with most of the scores concentrating in the centre (along the 0 line). The output for the scatter plot also appeared to meet this assumption as the distribution of the scores is greatly rectangular in shape. Thus, the analyses in general showed that no major violations of the assumptions have been there. For details, refer to the outputs attached as part of the appendices.

Multiple Regression Analysis of the Overall contribution of (Gender, Age, Parental Education, Parental Occupation and Student-Teachers Interaction) in Predicting academic performance (n=246).

Dependant Variable= Academic Achievement

Variables	B	SE	β	r	pr^2	spr^2	P-value
Gender	-.152	.080	-.124	-.119	-.0.015	-.014	.058
Age	-.070	.073	-.062	-.023	-.004	-.0036	.336
Fathers' education	-.083	.077	-.079	-.044	-.005	-.0045	.284
Mother education	.080	.077	.083	.046	-.0052	-.005	.268
Fathers' occupation	-.059	.042	-.104	-.003	-.0081	-.0076	.167
Mothers' occupation	.035	.052	.051	.031	-.0020	-.002	.489
Student-teachers interaction	.009.003	.222	.218	.0454	.0441		.001
R^2	0.074						
AdjR^2	0.042						
F	2.353			sig 0.019			

The result from standard multiple regression presented in Table above shows that the set of variables entered in to the model ,in combination, significantly predicted academic performance F(8,237)= 2.353, p < .05): R(.271), R^2(.074) and Adj.R^2(.042). This means that Gender, Age, Parental Education, Parental Occupation and Student-Teachers Interaction together accounted for 7.4% of the variance in academic performance. *R^2 was preferred over the Adjusted R^2because it gives a more approximate figure of the real variance in the true population when large samples are used (Pallant, 2007, p.158)*. On the other hand, the result also implies that some other unmeasured variables accounted for the remaining 92.6% of the variance in academic performance.

XII. Discussion

Objective: Student-Teachers interaction and academic achievement

The hypothesis stated as the highest student-teachers interaction the highest would be student's academic achievement in college. To test this hypothesis the researcher was developed standardized questionnaire and adopted into Ethiopian context. The reliability of the questionnaire was tested by pilot study by using crombach's alpha test and its reliability level

was 0.845 which was found to be acceptable. The Pearson Product Moment Correlation was used to determine the relationship between student-teachers interaction and academic achievement. The Pearson correlation result shows (r (246)=0.218, p=0.001) The finding reveals that there is significant difference in the academic performance between students who have high interaction with their teachers and students low or no interaction with their teachers. The mean academic performances of the students with and without teachers' interaction were 2.69 and 2.89 respectively. It is evident that students with high interaction with their teachers significantly score higher in their academic performance compared to students with less interaction with their teachers.

The findings of this study are consistent with the research conducted by Bembenutty, et.al. (2007) who argued that students with smooth relationship with their teachers tend to be more self-regulated and persistent in their learning, more motivated to learn and to be successful in their learning, experience less stress and good participation in class, and as a consequence have higher academic achievement and better perform in college than their counterparts who are low interaction with their teachers. Pianta, (1994; Lee, 2007) reported that students who have strong beliefs toward their teachers and the subject to perform well, they will have higher academic achievement than their counterpart students with low beliefs in their teachers and subjects well academically. Several studies conducted in colleges/ universities have found that student-teacher interaction had a significant and positive effect on academic achievement. The researcher noted that the studies by Silins and Murray-Harvey(1995), Elias and MacDonald (2007)were all correlative and regression studies and they had similar conclusions and so was this study.

This result may be explained by Robbins (2004), who argued that teacher and student interaction is highly related with both retention and academic achievement beyond that explained by more traditional (i.e., cognitive) academic predictors such as high school performance and standardized test scores. According to correlations of respondents on the interaction and academic performance, the two variables were highly correlated.

XIII. Conclusions

Based on the basic research question and objective of this research the following conclusions were made.

- Student-teachers interaction was statistically significantly correlated with students' college academic success. This implies that academic achievement would be significantly positively affected by students' level of interaction with their teachers. This result revealed that the level of interaction increase or become high, the academic achievement of students would become increase.
- There was statistically significant difference in academic performance between college students in different age groups.
- According to regression result the t-test associated with the beta value of the predictor (student-teachers Interaction) is making a significant contribution to the academic achievement.
- There was no statistically significant difference between male and female academic achievement of trainee teachers at Dilla College of teachers education. The result implies that male and female students have equal probability to succeed in college if the environment is conducive for teaching learning process.

XIV. Recommendations

Basing on the study findings and the conclusions, the researcher derived the following recommendations:

Objective: student-teachers interaction and academic achievement

Data collected from the study, presented information that suggests future workshops for educators and administrators, that may have a positive effect on the proven significance of the teacher-student relationship problem. Several issues should be addressed.

First, teachers should be provided with the appropriate resources and assistance to meet the needs of their students beyond academic instruction. Although here is no "one size fits all" solution, teachers should have the opportunity to develop a myriad of strategies that will help them understand the diversity and the complexity of their issues. Diversity and awareness training can be provided, while creating opportunities within the school for teachers and students to have non-academic interactions such as mentoring or family-type activities.

Second, students and teachers need to be provided with measurable and attainable goals to create experiences with and exposure to success. Accountability is crucial for both staff and students. Instructional and remediation strategies need to be implemented to prevent students from falling through the cracks. The development of effective professional learning communities would help teachers plan strategies to differentiate instruction and provide resources to create gender and culturally relevant lessons.

Third, there is a need for immediate action, highlighted by the slightly negative relationship between motivation and achievement. Research states that positive relationships positively influence motivation and

motivation is very important thing for academic success Bembenutty, et.al. (2007); the issue at hand is how to capitalize on these relationships and the student's motivation, to act as catalysts for achievement. If the students in college are motivated by their teachers, they start asking questions and it made them to make smooth relationship with their teachers and their academic performance will be good. Educators need to assist and challenge students to define their personal success, which can influence their performance.

Fourth, there is a tendency for colleges to focus on low achiever student so as to investigate the problem that affect their academic achievement taking immediate action accordingly. The need to meet state and national progress standards may be resulting in some colleges focusing so intently on the lowest performing students that their high performing students could begin to decline. High performance students could be experiencing lack of academic challenges and/or lack of recognition, as teachers are taking the time to build relationships with the lowest performing students. There needs to be a balance where all students are challenged and where the students who need additional assistance are provided with the appropriate scaffolds.

Lastly, the results of this study indicate there is indeed a statistically significant relationship between teacher-student interactions and motivation. This supports the need for more research to bridge the gap between motivating students and identifying the influential variables that influence their achievement.

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FELLOWS

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- The "FARSHS" is a dignified title which is accorded to a person's name viz. Dr. John E. Hall, Ph.D., FARSS or William Walldroff, M.S., FARSHS.

FARSHS accrediting is an honor. It authenticates your research activities. After recognition as FARSHS, you can add 'FARSHS' title with your name as you use this recognition as additional suffix to your status. This will definitely enhance and add more value and repute to your name. You may use it on your professional Counseling Materials such as CV, Resume, and Visiting Card etc.

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We shall provide you intimation regarding launching of e-version of journal of your stream time to time.This may be utilized in your library for the enrichment of knowledge of your students as well as it can also be helpful for the concerned faculty members.

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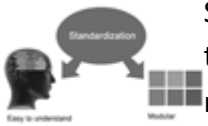

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MARSHS accrediting is an honor. It authenticates your research activities. Afterbecoming MARSHS, you can add 'MARSHS' title with your name as you use this recognition as additional suffix to your status. This will definitely enhance and add more value and repute to your name. You may use it on your professional Counseling Materials such as CV, Resume, Visiting Card and Name Plate etc.

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We shall provide you intimation regarding launching of e-version of journal of your stream time to time.This may be utilized in your library for the enrichment of knowledge of your students as well as it can also be helpful for the concerned faculty members.

The MARSHS member can apply for approval, grading and certification of standards of their educational and Institutional Degrees to Open Association of Research, Society U.S.A.

Once you are designated as MARSHS, you may send us a scanned copy of all of your credentials. OARS will verify, grade and certify them. This will be based on your academic records, quality of research papers published by you, and some more criteria.

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Institutional Fellow of Open Association of Research Society (USA) - OARS (USA)

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The IFOARS institution is entitled to form a Board comprised of one Chairperson and three to five board members preferably from different streams. The Board will be recognized as "Institutional Board of Open Association of Research Society"-(IBOARS).

The Institute will be entitled to following benefits:

The IBOARS can initially review research papers of their institute and recommend them to publish with respective journal of Global Journals. It can also review the papers of other institutions after obtaining our consent. The second review will be done by peer reviewer of Global Journals Incorporation (USA) The Board is at liberty to appoint a peer reviewer with the approval of chairperson after consulting us.

The author fees of such paper may be waived off up to 40%.

The Global Journals Incorporation (USA) at its discretion can also refer double blind peer reviewed paper at their end to the board for the verification and to get recommendation for final stage of acceptance of publication.

The IBOARS can organize symposium/seminar/conference in their country on behalf of Global Journals Incorporation (USA)-OARS (USA). The terms and conditions can be discussed separately.

The Board can also play vital role by exploring and giving valuable suggestions regarding the Standards of "Open Association of Research Society, U.S.A (OARS)" so that proper amendment can take place for the benefit of entire research community. We shall provide details of particular standard only on receipt of request from the Board.

The board members can also join us as Individual Fellow with 40% discount on total fees applicable to Individual Fellow. They will be entitled to avail all the benefits as declared. Please visit Individual Fellow-sub menu of GlobalJournals.org to have more relevant details.

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After nomination of your institution as "Institutional Fellow" and constantly functioning successfully for one year, we can consider giving recognition to your institute to function as Regional/Zonal office on our behalf.
The board can also take up the additional allied activities for betterment after our consultation.

The following entitlements are applicable to individual Fellows:

Open Association of Research Society, U.S.A (OARS) By-laws states that an individual Fellow may use the designations as applicable, or the corresponding initials. The Credentials of individual Fellow and Associate designations signify that the individual has gained knowledge of the fundamental concepts. One is magnanimous and proficient in an expertise course covering the professional code of conduct, and follows recognized standards of practice.

Open Association of Research Society (US)/ Global Journals Incorporation (USA), as described in Corporate Statements, are educational, research publishing and professional membership organizations. Achieving our individual Fellow or Associate status is based mainly on meeting stated educational research requirements.

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The individual Fellow and Associate designations accredited by Open Association of Research Society (US) credentials signify guarantees following achievements:

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- In addition to above, if one is single author, then entitled to 40% discount on publishing research paper and can get 10%discount if one is co-author or main author among group of authors.
- The Fellow can organize symposium/seminar/conference on behalf of Global Journals Incorporation (USA) and he/she can also attend the same organized by other institutes on behalf of Global Journals.
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- • This individual has learned the basic methods of applying those concepts and techniques to common challenging situations. This individual has further demonstrated an in–depth understanding of the application of suitable techniques to a particular area of research practice.

Note :

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- In future, if the board feels the necessity to change any board member, the same can be done with the consent of the chairperson along with anyone board member without our approval.
- In case, the chairperson needs to be replaced then consent of 2/3rd board members are required and they are also required to jointly pass the resolution copy of which should be sent to us. In such case, it will be compulsory to obtain our approval before replacement.
- In case of "Difference of Opinion [if any]" among the Board members, our decision will be final and binding to everyone.

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Acknowledgments

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- First character must be three lines drop-capped.
- The paragraph before spacing of 1 pt and after of 0 pt.
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- Large images must be in one column.
- The names of first main headings (Heading 1) must be in Roman font, capital letters, and font size of 10.
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Structure and Format of Manuscript

The recommended size of an original research paper is under 15,000 words and review papers under 7,000 words. Research articles should be less than 10,000 words. Research papers are usually longer than review papers. Review papers are reports of significant research (typically less than 7,000 words, including tables, figures, and references)

A research paper must include:

a) A title which should be relevant to the theme of the paper.
b) A summary, known as an abstract (less than 150 words), containing the major results and conclusions.
c) Up to 10 keywords that precisely identify the paper's subject, purpose, and focus.
d) An introduction, giving fundamental background objectives.
e) Resources and techniques with sufficient complete experimental details (wherever possible by reference) to permit repetition, sources of information must be given, and numerical methods must be specified by reference.
f) Results which should be presented concisely by well-designed tables and figures.
g) Suitable statistical data should also be given.
h) All data must have been gathered with attention to numerical detail in the planning stage.

Design has been recognized to be essential to experiments for a considerable time, and the editor has decided that any paper that appears not to have adequate numerical treatments of the data will be returned unrefereed.

i) Discussion should cover implications and consequences and not just recapitulate the results; conclusions should also be summarized.
j) There should be brief acknowledgments.
k) There ought to be references in the conventional format. Global Journals recommends APA format.

Authors should carefully consider the preparation of papers to ensure that they communicate effectively. Papers are much more likely to be accepted if they are carefully designed and laid out, contain few or no errors, are summarizing, and follow instructions. They will also be published with much fewer delays than those that require much technical and editorial correction.

The Editorial Board reserves the right to make literary corrections and suggestions to improve brevity.

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The abstract is the foundation of the research paper. It should be clear and concise and must contain the objective of the paper and inferences drawn. It is advised to not include big mathematical equations or complicated jargon.

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Authors are advised to submit any mathematical equation using either MathJax, KaTeX, or LaTeX, or in a very high-quality image.

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Tables: Tables should be cautiously designed, uncrowned, and include only essential data. Each must have an Arabic number, e.g., Table 4, a self-explanatory caption, and be on a separate sheet. Authors must submit tables in an editable format and not as images. References to these tables (if any) must be mentioned accurately.

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1. Choosing the topic: In most cases, the topic is selected by the interests of the author, but it can also be suggested by the guides. You can have several topics, and then judge which you are most comfortable with. This may be done by asking several questions of yourself, like "Will I be able to carry out a search in this area? Will I find all necessary resources to accomplish the search? Will I be able to find all information in this field area?" If the answer to this type of question is "yes," then you ought to choose that topic. In most cases, you may have to conduct surveys and visit several places. Also, you might have to do a lot of work to find all the rises and falls of the various data on that subject. Sometimes, detailed information plays a vital role, instead of short information. Evaluators are human: The first thing to remember is that evaluators are also human beings. They are not only meant for rejecting a paper. They are here to evaluate your paper. So present your best aspect.

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12. Know what you know: Always try to know what you know by making objectives, otherwise you will be confused and unable to achieve your target.

13. Use good grammar: Always use good grammar and words that will have a positive impact on the evaluator; use of good vocabulary does not mean using tough words which the evaluator has to find in a dictionary. Do not fragment sentences. Eliminate one-word sentences. Do not ever use a big word when a smaller one would suffice.

Verbs have to be in agreement with their subjects. In a research paper, do not start sentences with conjunctions or finish them with prepositions. When writing formally, it is advisable to never split an infinitive because someone will (wrongly) complain. Avoid clichés like a disease. Always shun irritating alliteration. Use language which is simple and straightforward. Put together a neat summary.

14. Arrangement of information: Each section of the main body should start with an opening sentence, and there should be a changeover at the end of the section. Give only valid and powerful arguments for your topic. You may also maintain your arguments with records.

15. Never start at the last minute: Always allow enough time for research work. Leaving everything to the last minute will degrade your paper and spoil your work.

16. Multitasking in research is not good: Doing several things at the same time is a bad habit in the case of research activity. Research is an area where everything has a particular time slot. Divide your research work into parts, and do a particular part in a particular time slot.

17. Never copy others' work: Never copy others' work and give it your name because if the evaluator has seen it anywhere, you will be in trouble. Take proper rest and food: No matter how many hours you spend on your research activity, if you are not taking care of your health, then all your efforts will have been in vain. For quality research, take proper rest and food.

18. Go to seminars: Attend seminars if the topic is relevant to your research area. Utilize all your resources.
Refresh your mind after intervals: Try to give your mind a rest by listening to soft music or sleeping in intervals. This will also improve your memory. Acquire colleagues: Always try to acquire colleagues. No matter how sharp you are, if you acquire colleagues, they can give you ideas which will be helpful to your research.

19. Think technically: Always think technically. If anything happens, search for its reasons, benefits, and demerits. Think and then print: When you go to print your paper, check that tables are not split, headings are not detached from their descriptions, and page sequence is maintained.

20. Adding unnecessary information: Do not add unnecessary information like "I have used MS Excel to draw graphs." Irrelevant and inappropriate material is superfluous. Foreign terminology and phrases are not apropos. One should never take a broad view. Analogy is like feathers on a snake. Use words properly, regardless of how others use them. Remove quotations. Puns are for kids, not grunt readers. Never oversimplify: When adding material to your research paper, never go for oversimplification; this will definitely irritate the evaluator. Be specific. Never use rhythmic redundancies. Contractions shouldn't be used in a research paper. Comparisons are as terrible as clichés. Give up ampersands, abbreviations, and so on. Remove commas that are not necessary. Parenthetical words should be between brackets or commas. Understatement is always the best way to put forward earth-shaking thoughts. Give a detailed literary review.

21. Report concluded results: Use concluded results. From raw data, filter the results, and then conclude your studies based on measurements and observations taken. An appropriate number of decimal places should be used. Parenthetical remarks are prohibited here. Proofread carefully at the final stage. At the end, give an outline to your arguments. Spot perspectives of further study of the subject. Justify your conclusion at the bottom sufficiently, which will probably include examples.

22. Upon conclusion: Once you have concluded your research, the next most important step is to present your findings. Presentation is extremely important as it is the definite medium though which your research is going to be in print for the rest of the crowd. Care should be taken to categorize your thoughts well and present them in a logical and neat manner. A good quality research paper format is essential because it serves to highlight your research paper and bring to light all necessary aspects of your research.

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Informal Guidelines of Research Paper Writing

Key points to remember:

- Submit all work in its final form.
- Write your paper in the form which is presented in the guidelines using the template.
- Please note the criteria peer reviewers will use for grading the final paper.

Final points:

One purpose of organizing a research paper is to let people interpret your efforts selectively. The journal requires the following sections, submitted in the order listed, with each section starting on a new page:

The introduction: This will be compiled from reference matter and reflect the design processes or outline of basis that directed you to make a study. As you carry out the process of study, the method and process section will be constructed like that. The results segment will show related statistics in nearly sequential order and direct reviewers to similar intellectual paths throughout the data that you gathered to carry out your study.

The discussion section:

This will provide understanding of the data and projections as to the implications of the results. The use of good quality references throughout the paper will give the effort trustworthiness by representing an alertness to prior workings.

Writing a research paper is not an easy job, no matter how trouble-free the actual research or concept. Practice, excellent preparation, and controlled record-keeping are the only means to make straightforward progression.

General style:

Specific editorial column necessities for compliance of a manuscript will always take over from directions in these general guidelines.

To make a paper clear: Adhere to recommended page limits.

Mistakes to avoid:

- Insertion of a title at the foot of a page with subsequent text on the next page.
- Separating a table, chart, or figure—confine each to a single page.
- Submitting a manuscript with pages out of sequence.
- In every section of your document, use standard writing style, including articles ("a" and "the").
- Keep paying attention to the topic of the paper.
- Use paragraphs to split each significant point (excluding the abstract).
- Align the primary line of each section.
- Present your points in sound order.
- Use present tense to report well-accepted matters.
- Use past tense to describe specific results.
- Do not use familiar wording; don't address the reviewer directly. Don't use slang or superlatives.
- Avoid use of extra pictures—include only those figures essential to presenting results.

Title page:

Choose a revealing title. It should be short and include the name(s) and address(es) of all authors. It should not have acronyms or abbreviations or exceed two printed lines.

Abstract: This summary should be two hundred words or less. It should clearly and briefly explain the key findings reported in the manuscript and must have precise statistics. It should not have acronyms or abbreviations. It should be logical in itself. Do not cite references at this point.

An abstract is a brief, distinct paragraph summary of finished work or work in development. In a minute or less, a reviewer can be taught the foundation behind the study, common approaches to the problem, relevant results, and significant conclusions or new questions.

Write your summary when your paper is completed because how can you write the summary of anything which is not yet written? Wealth of terminology is very essential in abstract. Use comprehensive sentences, and do not sacrifice readability for brevity; you can maintain it succinctly by phrasing sentences so that they provide more than a lone rationale. The author can at this moment go straight to shortening the outcome. Sum up the study with the subsequent elements in any summary. Try to limit the initial two items to no more than one line each.

Reason for writing the article—theory, overall issue, purpose.

- Fundamental goal.
- To-the-point depiction of the research.
- Consequences, including definite statistics—if the consequences are quantitative in nature, account for this; results of any numerical analysis should be reported. Significant conclusions or questions that emerge from the research.

Approach:

- Single section and succinct.
- An outline of the job done is always written in past tense.
- Concentrate on shortening results—limit background information to a verdict or two.
- Exact spelling, clarity of sentences and phrases, and appropriate reporting of quantities (proper units, important statistics) are just as significant in an abstract as they are anywhere else.

Introduction:

The introduction should "introduce" the manuscript. The reviewer should be presented with sufficient background information to be capable of comprehending and calculating the purpose of your study without having to refer to other works. The basis for the study should be offered. Give the most important references, but avoid making a comprehensive appraisal of the topic. Describe the problem visibly. If the problem is not acknowledged in a logical, reasonable way, the reviewer will give no attention to your results. Speak in common terms about techniques used to explain the problem, if needed, but do not present any particulars about the protocols here.

The following approach can create a valuable beginning:

- Explain the value (significance) of the study.
- Defend the model—why did you employ this particular system or method? What is its compensation? Remark upon its appropriateness from an abstract point of view as well as pointing out sensible reasons for using it.
- Present a justification. State your particular theory(-ies) or aim(s), and describe the logic that led you to choose them.
- Briefly explain the study's tentative purpose and how it meets the declared objectives.

Approach:

Use past tense except for when referring to recognized facts. After all, the manuscript will be submitted after the entire job is done. Sort out your thoughts; manufacture one key point for every section. If you make the four points listed above, you will need at least four paragraphs. Present surrounding information only when it is necessary to support a situation. The reviewer does not desire to read everything you know about a topic. Shape the theory specifically—do not take a broad view.

As always, give awareness to spelling, simplicity, and correctness of sentences and phrases.

Procedures (methods and materials):

This part is supposed to be the easiest to carve if you have good skills. A soundly written procedures segment allows a capable scientist to replicate your results. Present precise information about your supplies. The suppliers and clarity of reagents can be helpful bits of information. Present methods in sequential order, but linked methodologies can be grouped as a segment. Be concise when relating the protocols. Attempt to give the least amount of information that would permit another capable scientist to replicate your outcome, but be cautious that vital information is integrated. The use of subheadings is suggested and ought to be synchronized with the results section.

When a technique is used that has been well-described in another section, mention the specific item describing the way, but draw the basic principle while stating the situation. The purpose is to show all particular resources and broad procedures so that another person may use some or all of the methods in one more study or referee the scientific value of your work. It is not to be a step-by-step report of the whole thing you did, nor is a methods section a set of orders.

Materials:

Materials may be reported in part of a section or else they may be recognized along with your measures.

Methods:

- Report the method and not the particulars of each process that engaged the same methodology.
- Describe the method entirely.
- To be succinct, present methods under headings dedicated to specific dealings or groups of measures.
- Simplify—detail how procedures were completed, not how they were performed on a particular day.
- If well-known procedures were used, account for the procedure by name, possibly with a reference, and that's all.

Approach:

It is embarrassing to use vigorous voice when documenting methods without using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result, when writing up the methods, most authors use third person passive voice.

Use standard style in this and every other part of the paper—avoid familiar lists, and use full sentences.

What to keep away from:

- Resources and methods are not a set of information.
- Skip all descriptive information and surroundings—save it for the argument.
- Leave out information that is immaterial to a third party.

Results:

The principle of a results segment is to present and demonstrate your conclusion. Create this part as entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Use statistics and tables, if suitable, to present consequences most efficiently.

You must clearly differentiate material which would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matters should not be submitted at all except if requested by the instructor.

Content:

- Sum up your conclusions in text and demonstrate them, if suitable, with figures and tables.
- In the manuscript, explain each of your consequences, and point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation of an exacting study.
- Explain results of control experiments and give remarks that are not accessible in a prescribed figure or table, if appropriate.
- Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or manuscript.

What to stay away from:

- Do not discuss or infer your outcome, report surrounding information, or try to explain anything.
- Do not include raw data or intermediate calculations in a research manuscript.
- Do not present similar data more than once.
- A manuscript should complement any figures or tables, not duplicate information.
- Never confuse figures with tables—there is a difference.

Approach:

As always, use past tense when you submit your results, and put the whole thing in a reasonable order.

Put figures and tables, appropriately numbered, in order at the end of the report.

If you desire, you may place your figures and tables properly within the text of your results section.

Figures and tables:

If you put figures and tables at the end of some details, make certain that they are visibly distinguished from any attached appendix materials, such as raw facts. Whatever the position, each table must be titled, numbered one after the other, and include a heading. All figures and tables must be divided from the text.

Discussion:

The discussion is expected to be the trickiest segment to write. A lot of papers submitted to the journal are discarded based on problems with the discussion. There is no rule for how long an argument should be.

Position your understanding of the outcome visibly to lead the reviewer through your conclusions, and then finish the paper with a summing up of the implications of the study. The purpose here is to offer an understanding of your results and support all of your conclusions, using facts from your research and generally accepted information, if suitable. The implication of results should be fully described.

Infer your data in the conversation in suitable depth. This means that when you clarify an observable fact, you must explain mechanisms that may account for the observation. If your results vary from your prospect, make clear why that may have happened. If your results agree, then explain the theory that the proof supported. It is never suitable to just state that the data approved the prospect, and let it drop at that. Make a decision as to whether each premise is supported or discarded or if you cannot make a conclusion with assurance. Do not just dismiss a study or part of a study as "uncertain."

Research papers are not acknowledged if the work is imperfect. Draw what conclusions you can based upon the results that you have, and take care of the study as a finished work.

- You may propose future guidelines, such as how an experiment might be personalized to accomplish a new idea.
- Give details of all of your remarks as much as possible, focusing on mechanisms.
- Make a decision as to whether the tentative design sufficiently addressed the theory and whether or not it was correctly restricted. Try to present substitute explanations if they are sensible alternatives.
- One piece of research will not counter an overall question, so maintain the large picture in mind. Where do you go next? The best studies unlock new avenues of study. What questions remain?
- Recommendations for detailed papers will offer supplementary suggestions.

Approach:

When you refer to information, differentiate data generated by your own studies from other available information. Present work done by specific persons (including you) in past tense.

Describe generally acknowledged facts and main beliefs in present tense.

The Administration Rules

Administration Rules to Be Strictly Followed before Submitting Your Research Paper to Global Journals Inc.

Please read the following rules and regulations carefully before submitting your research paper to Global Journals Inc. to avoid rejection.

Segment draft and final research paper: You have to strictly follow the template of a research paper, failing which your paper may get rejected. You are expected to write each part of the paper wholly on your own. The peer reviewers need to identify your own perspective of the concepts in your own terms. Please do not extract straight from any other source, and do not rephrase someone else's analysis. Do not allow anyone else to proofread your manuscript.

Written material: You may discuss this with your guides and key sources. Do not copy anyone else's paper, even if this is only imitation, otherwise it will be rejected on the grounds of plagiarism, which is illegal. Various methods to avoid plagiarism are strictly applied by us to every paper, and, if found guilty, you may be blacklisted, which could affect your career adversely. To guard yourself and others from possible illegal use, please do not permit anyone to use or even read your paper and file.

Criterion for Grading a Research Paper (Compilation) by Global Journals

Please note that following table is only a Grading of "Paper Compilation" and not on "Performed/Stated Research" whose grading solely depends on Individual Assigned Peer Reviewer and Editorial Board Member. These can be available only on request and after decision of Paper. This report will be the property of Global Journals

Topics	Grades		
	A-B	**C-D**	**E-F**
Abstract	Clear and concise with appropriate content, Correct format. 200 words or below	Unclear summary and no specific data, Incorrect form Above 200 words	No specific data with ambiguous information Above 250 words
Introduction	Containing all background details with clear goal and appropriate details, flow specification, no grammar and spelling mistake, well organized sentence and paragraph, reference cited	Unclear and confusing data, appropriate format, grammar and spelling errors with unorganized matter	Out of place depth and content, hazy format
Methods and Procedures	Clear and to the point with well arranged paragraph, precision and accuracy of facts and figures, well organized subheads	Difficult to comprehend with embarrassed text, too much explanation but completed	Incorrect and unorganized structure with hazy meaning
Result	Well organized, Clear and specific, Correct units with precision, correct data, well structuring of paragraph, no grammar and spelling mistake	Complete and embarrassed text, difficult to comprehend	Irregular format with wrong facts and figures
Discussion	Well organized, meaningful specification, sound conclusion, logical and concise explanation, highly structured paragraph reference cited	Wordy, unclear conclusion, spurious	Conclusion is not cited, unorganized, difficult to comprehend
References	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring

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