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Innovation Eclipsed by Simplistic Resourcefulness: The Root Cause of Miseducation in Teacher Education Institutions

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Abstract

There is a clamour about innovation concerning the production of goods and services in many third world countries. The prime conviction is that the economies of such countries are going to be improved through innovative production of goods and services. About Zimbabwe in particular, all students pursuing either higher or tertiary education are supposed to embark on projects which are focused on innovation. Consequently, every institution of higher or tertiary education is supposed to construct an innovation hub. There is a conviction that the students are going to do their innovations in the innovation hub. The educators could be more focused about innovation if they get some insights from the 'laboratory school' initiated by John Dewey. However, both the educators and the students have not been formally conscientized of the philosophy informing the modus operandi of carrying out innovative ventures. The students are resorting to simplistic resourcefulness and are considered to be innovative. Lack of attuning of the mind to the transformative paradigm which is embodied in action research is indispensable to authentic innovations. There is a symbiotic synergy between action research and genuine innovation which should be carried out in a 'laboratory school'. In education, the disruptive innovation theory anchors the contextual framework of innovation. A qualitative research was carried out with lecturers and students in a teacher education college. The aim was to ascertain the extent to which the dearth of insights from the laboratory school promotes simplistic resourcefulness which eclipses innovation and the modus operandi thereof. The informants were purposively selected on the basis of awarding and being awarded distinctive marks in the production of the presumed prototypes. The data were analysed by employing the thematic approach. The findings are that the students anchor their artefacts on baseless intuition which has extreme rarity in producing prototypes in the contemporary technologically driven world. In earnest, the students have hardly produced any prototypes which can be patented. There is a dire need to orient the students in action research so that they are engaged in systematic actions for the creation of prototypes. First and foremost the students are supposed to generate baseline data about the dysfunctionalities of artefacts and services which they endeavour to improve on.

Keywords: Innovation; Simplistic resourcefulness; Miseducation; Laboratory school; Action research

Introduction

Innovation is one of the central pillars of Education 5.0. In Zimbabwe a lot of lip-service has been done by both politicians and educators about innovation at academic forums like graduations. A graduation theme devoid of the term 'innovation' is a nullity. The wave of innovation has precipitated the construction of innovation hubs at institutions of higher and tertiary education. Those institutions which did not get involved in the construction of innovation hubs turned some of their buildings into 'innovation hubs'. Innovation is noble and is informed by Dewey's philosophy of pragmatism and Schon's theory of reflective practice. The very theme which is focused on by the two theorists is the 'laboratory school' which in the context of this research is conceptualised as the modern-day innovation hub. The embodiment of the noble idea of innovativeness in practicing spaces needs to be systematized for the sake of credibility. All the practitioners wherever they are practicing, they are in their laboratories - the innovation hubs. The practitioner should never be contented of the prevailing situation in practicing. There is always room for improvement. Such a disposition is anchored on the transformative paradigm and precipitates reflective thinking. The innovation hub should be considered as intellectual rather than physical. The infrastructural hub is not a prerequisite for innovative thinking.

In the education phenomenon, the innovation hubs are the classrooms, lecture halls and the asynchronous platforms. According to Dewey [1], the experimentations on how learners learn should be done where the practicing is being done. Practicing should be contextual and not separated from realities being experienced. Innovations on practicing strategies are always anchored on reflections on the practicing. Thus, there should be reflection-in-action and reflection-on-action for effective reflection-for-action to follow. The practitioners should research on their practices for efficacy. Research on practice is hinged on action research. Consequently, improved practice or innovative ventures on practice are anchored on action research. Action research is the modus operandi of credible innovations.

Background to the Study

In Zimbabwe, embarking on innovative projects by students pursuing teacher education is mandatory as stated in the quality assurance framework (QAF) by the University of Zimbabwe. Innovation is considered as one of the criteria of quality education in Zimbabwean tertiary education [2]. However, innovation as a pillar of education 5.0 is nebulous. It's not clear as to what the students are supposed to produce in realisation of innovativeness. Even students who do not pursue studies in the technical domain are compelled to produce prototypes in the technical domain. The innovation hubs constructed in the institutions of higher and tertiary education are meant to be laboratories or workshops to produce tangible artefacts which are prototypical [3]. The students seem not to be producing any prototypical artefacts. Some students contract some people to make artefacts which are far from being considered as prototypes. Very often, such artefacts are credited by some educators as showing some innovations. At some institutions the artefacts are kept in some rooms which are referred to as innovation hubs. However, innovation is not as simplistic as considered by some teacher-educators. There seems to be a confusion of innovation with resourcefulness [4]. The confusion obfuscates what innovation is all about. There is a very thin dividing line between innovation and resourcefulness. The confusion of these two constructs adversely influences engagement in innovative ventures. Resourcefulness is one of the criteria enroute to innovation. Thus, the misconstruction of what innovation is begets complacency when one thinks that he or she has made innovations when one has just been resourceful.

Statement of the Problem

Explications about the root causes of confusing innovation with resourcefulness are indispensable in situations where innovation is the prime criterion of quality education. The purpose of this article is to ascertain the extent to which the lack of knowledge about the modus operandi of coming up with innovations has presumably obscured and caused misconstructions of the conceptualisation of the innovative practice. The presumptions need to be confirmed and rationalized. There is research about the importance of innovation reigning over the other pillars of education 5.0. However, there is a dearth of research about the reasons why innovations are not being realized but simplistic resourcefulness. Even though there is articulate advocacy about the essence of innovation in teacher education colleges there no explications of the modus operandi thereof.

Theoretical Framework

Innovations in the realm of education are best conceptualized in the disruptive innovation theory which was coined by Clayton Christensen in 1997. The disruptive innovation theory emphasizes on innovations which are meant to improve products and services which should disrupt the prevailing markets and value networks [5,6]. This characteristic of disruptive innovation anchors the emphasis on the synergy between innovation and entrepreneurship in teacher education [7]. The disruptive theory conceptualises innovation as process [8]. Thus, the disruptive theory provides a relevant framework since the focus of this research is on procedural knowledge of innovation.

Explications of Constructs

There are some constructs which are related to innovation which need some explications to ward off misconstructions. The distinguishing explications of the related terms help in the clarification of the term 'innovation'. The terms related to innovation are resourcefulness and invention.

Innovation

The etymology of the term innovation is from the Latin verb 'Innovare' which means to introduce something new [9]. Innovation is very often confused with invention. The two constructs are related in terms of the consideration of novelty of strategies, services and artefacts. An innovation is a substantially improved modification of the prevailing ideas, methods or artefact which is a consequence of the planned interventions. An innovation does not happen by chance or intuitively, but it is planned systematically [10]. The one who innovates firstly detects a dysfunctionality in either a strategy, service or an artefact. The dysfunctionality thus becomes the knowledge gap which should be closed by embarking on action research. The researcher ideates on possible means of alleviating the dysfunctionality. The ideas are then actualised systematically in action research cycles which are meant to eradicate the dysfunctionality. The successful eradication of the dysfunctionality becomes an innovation. The documentation of all the interventions made enroute to the eradication of the dysfunctionality scientifically authenticates the innovation. Thus, innovation is closely intertwined with empiricism. The embodiment of ideas through action research is empirical.

Innovation is defined by Jain [11] as the process of bringing about new ideas, methods, products, services or solutions. The definition needs some rethinking. Innovation should be considered as the outcome of a process which produces the desirable results. The unpacking of the process points to active participation of the researcher to transforming the existing strategies, services or artefacts.

According to Johnson [12], innovation involves coming up with new ideas, concepts, products or methods. The definition is not explicit about how the new valuables could be generated. The definition is more aligned to invention. About innovation, there should be an enhancement of the existing situation. Johnson elevates the essence of creativity in innovation and explicates how it begets novelty. Creativity is requisite during intervention when the researcher is trialling ideas [10]. Novelty should be realized in terms of enhancements of the then prevailing statuses of situations not as independent and standalone ingenuity. When novelty is not vigorously interrogated, there could be confusions between innovation and resourcefulness.

Resourcefulness

Resourcefulness is the ingenuity to find efficacious strategies to mitigate or totally eradicate a problem. The ingenuity is realised when one explores and exploits the resources that are readily found in the environment. Thus, resourcefulness requires that one uses the locally available resources for the creation of artefacts and provision of services to satisfy some needs. Resourceful people realize a lot of dormant resources and strategies ready to be exploited for serving some needs. Consequently, resourcefulness is partly a mind-set and partly a strategy. One who is resourceful has a mind oriented towards exploiting the resources in the environment for satisfying some needs. The aspect of being partly a strategy is about being the way to innovation.

Invention

The construct 'invention' is very much confused with the construct 'innovation'. The terms are erroneously used interchangeably since both focus on 'newness'. The construct 'invention' is comprehensible when it is explicated with reference to innovation. Invention is the anchorage of innovation. Thus, the requisite knowledge for innovation is based on invention.

It is invention which provokes innovation. Invention denotes the origination of a concept, process or product. In invention there is absolute newness in the outcome [13]. The outcome of an invention should have a functional purpose. The utility value to society is a paramount consideration. A specific problem experienced by the society is mitigated or at best eradicated [14].

The synergistic Explications of Invention, Innovation and Resourcefulness

The synergistic explications are focused on the analytic explications of the relationships of the constructs. When there is mutuality in the explications, the clarity of each of the constructs is enhanced. When mutuality is underlying, the explications are to some extent symbiotic. The symbiotic explications are mutually beneficial to all the constructs.

Invention is the initial creation of an idea, procedure or product. The initial creation is the anchorage of innovation which focused on the development of an idea, procedure or product to satisfy the needs of society. The innovations of the outcomes require that there is resourcefulness. Thus, the available resources should be exploited efficiently to solve some problems. The three constructs are closely intertwined.

Laboratory School

The Laboratory School was an experimental school which was founded at the University of Chicago by John Dewey in 1896 [15]. The experimental school was dubbed the Laboratory School. The school was created to be a laboratory for testing ideas which were meant to improve on teaching and learning [16]. Simultaneously, the results from the Laboratory School were meant to expose the vices of traditional education. Dewey had a vision of creating a school environment which could be improved by; research on teaching while teaching and experimenting on teaching with critical reflections on the results. There was an obsession on the teacher professional development through praxis. Thus, through their practicing, the educators were expected to generate theories and instantaneously reflect on theory to improve on practice. The educators were supposed to be reflective practitioners who could improve on their practices through their research [17]. Accordingly, praxis is transformational in education [18,19]. The goal of incorporating praxis in the Laboratory School was to revolutionize education and usher in proclivity of innovations in educational institutions. What was done in the Laboratory School should be done, mutatis mutandis in the innovation hub. The innovation hub should be considered as the practicing space of any practitioner.

Some nation-states which have considered insights from the laboratory school, for example Finland has made remarkable reforms in their education systems. The Finnish education reform programme has benefitted from the research-oriented teacher educators [20]. The educators who are research-oriented are guided by the transformative paradigm and have a propensity for innovativeness using the available resources [21]. The practitioners should not await the construction of a physical structure to carry out innovative ventures but should do so in their practicing spaces.

Action Research

The authenticity of the innovative ventures is embedded in systematic interventions by the researcher into the dysfunctionalities of either a strategy, service or an artefact. The intervention should be researched action. In this regard, the modus operandi of innovation is action research [22].

Action research is defined by Kemmis & McTaggart [23] as;

... a form of collective self-reflective enquiry undertaken by participants in social situations to improve the rationality and justice of their own social and educational practices and the situations in which these practices are carried out.

Accordingly, action research is an indispensable research strategy that should be employed by practitioners when they make innovations in their practicing environments [24]. Action research is basically the means for improvement and innovation is the outcome of researched improvement. Consequently, there is a strong synergy between action research and innovation [25].

Action research for innovations in education was formally familiarized to teacher education by Stephen Cory at Columbia University in 1950s [22]. Cory postulated that.

We are convinced that the disposition to study ... the consequence of our own teaching is more likely to change and improve our practices than is reading about what someone else has discovered of his teaching.

Cory accentuated the prominence of action research as the modus operandi for innovative teaching by the practitioners themselves. The education practitioners are advised to employ action research in all their innovative ventures.

Empirical Investigation

The qualitative research approach was employed for the generation of empirical data. Consequentially the research paradigm was interpretivism. The conception of the interpretivist paradigm is illusive when juxtaposed with its contradistinctive paradigm which is positivism. Many scholars consider interpretivism and positivism as polarized and this consideration precipitates the misconstruction of interpretivism. When objectivity as the principal characteristic of positivism is emphasized, some scholars rush for contradistinctive descriptor, 'subjectivity'. The interpretivist paradigm should be conceptualised as a research philosophical viewpoint which posits that reality is a contextual social construct. The social interactive characteristic of the interpretivist paradigm is emphasized by Alharahsheh, and Pius [26] who posit that meanings of experiences are social constructions. Thus, the interpretivist paradigm seeks to explicate phenomena from the informants' experiences. According to the interpretivists, meanings of phenomena should always be in the contexts of participants. The so-called subjectivity lies in the *etic* (outsiders') interpretations of the *emic* (participants') interpretations of realities. The focus of the empirical study being on interpretation of the realities of the informants implies that the paradigm considered is hermeneutic phenomenology. Phenomenology deals the descriptions of the lived experiences of the informants and attempts to penetrate illusions of the experiences to explain the reality underlying the illusions realities [27]. Hermeneutics is concerned with

interpretations of the experiences. The researcher should subdue his or her idiosyncratic biases to come up with authentic interpretations of the empirical (that is as free as possible from any of the researcher's biases) narratives of the informants [28].

The data were generated from interviews which were held with eight student teachers and five lecturers. The informants were purposively selected. The criteria for selection were that the five lecturers had awarded distinctive marks for the so-called innovative artefacts and the eight student teachers are the ones who had been awarded the distinctive marks. The observance of anonymity for confidentiality was realised by assigning some pseudonyms to the informants. The lecturers were assigned pseudonyms; L1, L2, L3, L4 and L5. The student teachers were assigned the pseudonyms; S1, S2, S3, …S15. The consent of the informants to have the interview being audio taped was sought and was granted. All the valuable data generated were captured. Audiotaping ensures that there are no verbal data which are lost [8]. Consequentially verbatim transcriptions are guaranteed which subsequently lead to authentic data analysis. The data generated were analysed thematically by employing the Johnson-Christensen method . The recurring ideas in the data were identified and considered as the themes which are important for the research. The themes were crystalized from the excerpts. In the context of qualitative data, excerpts are verbatim quotes from the informants on which the themes are anchored. Thus, excerpts are the evidence for the etic interpretations [29].

Reflections on Findings

Confusing Innovation with Resourcefulness

In teacher education there is always emphasis on the resourcefulness of the teacher for effective facilitation of learning. The effective teacher uses the readily available resources so that the learners continue interacting with the resources even after school hours. The resourceful teacher also uses the available resources to make some artefacts which he or she uses as media [30]. The student teachers who are overly resourceful are fallaciously labelled as being innovative. Consequentially there is focus on pseudo innovations at the expense of genuine innovation.

The construct, 'pseudo innovations' has been precipitated by the adulteration and obscurity of the construct, 'innovation' due to its overuse and over-emphasis. In this era when everything and anything is supposed to be innovative there is dire need to distinguish innovation from pseudo innovation. Pseudo innovation artefacts, procedures and ideas are mimicries of previous innovations [11]. Pseudo innovations are labelled innovations by people who want to create impressions that they are innovative. Innovation is distinguishable from pseudo innovation by considering three criteria which are novelty, efficacy and utility [11]. Any venture which does not meet all the three criteria is pseudo innovation.

The postulations of the lecturers which are focused on pseudo innovativeness are presented below;
"*The student teacher is very innovative. She has produced very beautiful door mats using some cut-offs of fabric materials"* (L1).
"The doll made from waste plastic materials shows a lot of innovativeness" (L2).
"The student is very innovative since he has produced the model of the robot using some ordinary torch bulbs" (L3).
"The innovative student used the bottle tops to make a very beautiful office bin" (L4).
"The student showed great innovativeness, she has managed to make very tasty jam from guavas which are readily available in the forest" (L5).

The construct, 'innovation' is quite illusory to the teacher education student [31]. What the student teachers consider to be innovations are pseudo innovations. The students' conceptualizations of innovation are terribly astray. The students are essentially applying the age-old solutions to specific contextual challenges. Thus, the students are simply resourceful. Considering the symbiotic relation between innovation and entrepreneurship, none of the artefacts could be disruptive to the market and value networks.

The students who were awarded the distinctive marks for the artefacts they had shown resourceful had the following postulations.
"I was very happy when the lecturer appreciated my innovativeness. I used waste materials to come up with the beautiful mats" (S1).
"A student teacher who is innovative uses waste materials like plastic to come up with valuable artefacts like this doll" (S2).
"I thought about how I could make the model of a robot. I was happy when I came up with this innovative model which was awarded a distinction mark" (S3).
"*I was innovative when I made the model of a wheelbarrow using some scrap materials*" (S4).
"I was very innovative. I made a lot of teaching media from very cheap materials which are locally available" (S5)
"The model of a television set (TV) looks like a real TV. I was quite innovative. I made it from a cardboard box which had been thrown away as rubbish" (S6)
"I realized that there were a lot of guavas which were rotting in the forest, and I decided to be innovate by making some jam" (S7)

The students made use of the available resources in the ways which they deemed the best in their circumstances. Consequentially, resourcefulness in the context of the student teachers and the lecturers studied is quite idiosyncratic. The artefacts which were made are far away from being innovative and they do not have the potential for entrepreneurial value [6].

Confusing Innovation with Creativity

There is hazy understanding among the lecturers of the intertwined relationship between creativity and innovation. The two constructs are synonymous and there is obfuscation of issues which encapsulate them. The lecturers succumb to pseudo creativity which is considered as innovation. Pseudo-creativity has one of its defining characteristics as the imitation of the creative works of others Brem, et al. [32]. The ideas, methods and artefacts of others are manipulated to make them appear to be original. The postulations of the lecturers who mistook pseudo creativity for innovation are as follows.

"The student is very innovative. She has created a reading-spinning. It should be very efficacious when teaching the infant graders" (L1).

"The student teacher is innovative. She has made floor polish by mixing chlorophyll of some leaves with used oil and waste plastic" (L2).

"The student showed innovation by making some paint by mixing sap from some trees and glue" (L3).

"The student teacher is outstanding in innovation. He has created a model which shows how food is digested" (L4).

"The student is exceptional. He has infused music in the teaching of learners about some mathematics concepts. Learners are learning through entertainment" (L5).

The pseudo creativity which was appraised by the lecturers has pseudo self- evaluation on the performance of the learners. The learners become complacent in creativity having developed a reinforced-pseudo evaluation. Pseudo creativity stifles the students' motivation to confront challenges with genuine innovations [33]. Nurturing students for creativity requires that the educator provides truthful evaluation of the creative ventures of the students. Appraising pseudo creativity is mis educative. A mis educative experience impedes motivation for creativity by promoting pseudo creativity [34]. In such a situation the learners lose the impetus to learn [1]. After having got pseudo evaluation, the learner is not motivated to be engaged in authentic creativity [35]. Pseudo evaluations are caused by constraints due to misinformation about evaluation criteria. More so, considering not exploiting current technologies, most of the ventures in the interest of innovation and creativity are pseudo [36]. The postulations of the student teachers who had succumbed to pseudo creativity are.

"*When my grade three learners were not motivated to read, I was innovative, and I created the reading-spinning wheel*" (S8).

"I was innovative by making some floor polish from the chlorophyll of some leaves. I got a distinctive mark for my innovativeness" (S9).

"I scored a high mark for my innovativeness when I created some paint from the sap of some trees" (S10).

"I was very innovative when I created a model of the digestive system. The learners understood the digestive system very well" (S11).

"I was very innovative since the learners now enjoy learning by having music during learning episodes" (S12).

The students have embraced pseudo creativity which has been positively sanctioned by pseudo evaluations. None of the students was creative but their works were distinctive in creativity. The evaluators are not genuine since they make advocacy-based evaluations which push for a certain agenda aimed at supporting a specific recommendation [37]. The tertiary education curriculum requires that the student teachers should be innovative therefore the lecturers wanted the authorities to think that something innovative is happening in the tertiary education institutions.

Dearth of Knowledge of the Modus Operandi of Innovation

Innovation is not spontaneous [38] but is a result of a well-planned process which starts from situation analysis. The situation analysis exposes dysfunctional ideas, methods and artefacts. Thus, the internal and external factors which influence a dysfunctional situation are assessed. This involves generating and analysing baseline data which informs the prevailing situation, explore challenges and opportunities, and ultimately help in suggesting possible intervention strategies [39]. The planning for innovations structures the activities which help the actualization of creative ideas into concrete ideas. According to Si and Chen [40], the disruptive innovation as a process requires that a simpler, more affordable product or service is introduced targeting a niche market.

Some lecturers are not aware of the need for strategies to be employed for innovations. The postulations which they made are presented below.

"Innovation is just innovation. We are after artefacts which show innovativeness. Ingenuity is more important than procedures" (L1).

"I witnessed a student making a deodorant by mixing a variety of ingredients. She was innovative. The is no need for a plan" (L2).

"What is important in innovation is making something new

from one's imaginations" (L3).
"Am not sure if there is a systematic procedure which should be followed for innovative ventures" (L5).

One of the lecturers was aware of the importance of planning for the innovation. He postulated that;
"*One needs to assess the efficacy of the prevailing situation then plan the intervention strategies aimed at improving the situation"* (L4).

Planning is indispensable to genuine innovations [41]. Within the disruptive innovation theoretical framework, there is need to observe the stages of disruptive innovation which are: opportunity identification; ideation; idea refinement, evaluation, and prioritization; development and prototyping; and testing and iteration [42]. The steps of disruptive innovation require planning [43]. Through effective planning there is provision of a structured approach for implementing innovative ideas. Some students have embraced pseudo innovative approaches. The postulations of the students are presented below.
"Innovation just came to me as a flash of insight. There is no need to grapple with procedural issues about innovation" (S13).
"I had to engage someone to make an innovative item. I didn't have the knowledge and the skills of designing the artefact" (S14).
"*I am not sure if there are any procedures which innovators should employ. Innovation comes when it comes. It comes naturally*" (S15).

The student teachers who are not formally exposed to the modus operandi of innovativeness are being exposed to non-educative experiences. They are not capacitated with the requisite procedural knowledge about innovation [44]. The students are not actively involved in genuine innovation, but pseudo innovation is perpetuated. Pseudo innovation is non-educative since the student gain virtually nothing from the haphazard and educationally meaningless engagements.

Conclusion

The higher and tertiary education curriculum is obsessed by the innovation of the students. The over emphasis of innovation has degenerated into advocacy-based evaluations of innovation. The teacher educators are making pseudo evaluations about what innovation entails. The pseudo evaluations cause the student teachers to be engaged in pseudo creativity and pseudo innovations. The prevailing situation is tantamount to saying that the student teachers are exposed to non-educative and mis educative experiences. The teacher educators and the student teachers are not aware of that their practicing spaces are their laboratories which are in fact their innovation hubs. The practitioners are also not aware of the modus operandi of coming up with innovations, which is action research. Without the correct attuning of the mind to employ action research, innovation will always be a pipe dream being confused with resourcefulness and creativity.

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