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REFLECTIVE TEACHING FOR EFFECTIVE TECHNICAL VOCATIONAL EDUCATION AND TRAINING INSTRUCTIONAL DELIVERY IN A KNOWLEDGE-BASED ECONOMY

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Abstract

Today's world is currently knowledge-based due to globalization which brought information and communication technology into being. This paper highlights the concept of Technical Vocational Education and Training (TVET), its objectives and training areas. The paper discussed the concept of knowledge-based economy, the pillars of knowledge-based economy, and the characteristics of knowledge-driven economy. The paper also discussed instructional strategies for effective delivery of TVET in knowledge-based economy. The paper affirms that reflective teaching model allows teachers to closely and critically observes all that goes on in the class and enables the teacher to examine his/her work in order to consider alternative ways of ensuring that students learn thereby encouraging joint construction of knowledge. The paper also looked at the characteristics, benefits and limitations of reflective learning. Conclusively, the paper suggested among other that: teachers should constantly question their aims and actions because they need to be clear on what they want to achieve and how they intend to achieve it; the curriculum of TVET should include training on effective communications in an increasingly technical and knowledge-driven environment. It should also include training on willingness to take on responsibility, collaborative work skills, innovation, critical thinking and problem-solving.

Keywords: Reflective Teaching; Technical Vocational Education; Training Knowledge Based Economy.

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1. Introduction

Education is the bedrock of any society. Globally, education is the panacea to various problems and an instrument for economic advancement. It is the key determinant of progress in developed countries (Odekunle, (2014). An educational programme is an instrument that can be used to bring

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about desirable change in people or society by equipping them with skills and knowledge needed for self-reliance and sustainable development through teaching and learning. Educational programme, as a teaching and learning device can be manipulated in order to cause a desirable change in any community. Education has a lot of programmes but this paper is focused on technical, vocational education and training (TVET). TVET is capable of enhancing transformation of a person and can lead to a desired change in the society (Smart, 2015). There is virtually no problem that cannot be solved through education. The problem of increased population growth, civilization, poverty and unemployment are due to lack of employable skills and other related factors that can be solved through TVET.

Concept of Technical Vocational Education and Training

TVET is an educational programme that a person receives which equips him/her with functional and relevant knowledge, skills and aptitudes in relation to the three domains of learning (affective, cognitive and psychomotor) necessary for creating/securing, progressing and retaining an occupation which leads to production of an educate-ably self-reliant individual. TVET involves the study of technologies and related sciences, the acquisition of practical skills, attitudes, understanding and knowledge relating to occupation in various sectors of economic and social life in addition to general education. Different researchers have looked TVET in various perspectives. TVET is the learning aimed at developing skills in the practice if certain trades as well as learning aimed at preparing students for entry into the labour market in general (UNESCO, 2012). It encompasses programmes that provide participants with skills, knowledge and aptitudes that enable them to engage in productive work, adapt to rapidly changing labour markets and economies and participate as responsible citizens in their respective societies. To Guskey (2010), TVET is the education designed to develop skills, abilities, understanding, attitudes, work habits and appreciation encompassing knowledge and information needed by workers to enter and make progress in employment on a useful and productive basis. TVET is an education set up to produce skilful manpower for industries (Osuala, 2015). It is an integral part of the total educational programme that contributes to the development of good citizens by developing their physical, social, civil, cultural and economic competence all in a bid to fostering national development. The objectives of TVET according to the Federal Republic of Nigeria (FRN) (2014) are: (i) provide trained manpower in the applied sciences, technology and business particularly at craft, advance craft and technical levels; (ii) provide the technical knowledge and vocational skills necessary for agricultural, commercial and economic development; and (iii) give training and impart the necessary skills to individuals for self-reliance economically.

TVET areas include: agricultural, business, computer, industrial (auto-mechanics, building, electrical/electronics, metal-work and woodwork), home-economics and entrepreneurial trainings. These training areas are further broken down into different occupational trade areas as contained in the national policy on education. They include: auto electrical work, auto mechanical work, air conditioning and refrigeration, electrical installation and maintenance work, radio, TV and electronic servicing, block laying, brick laying and concrete work, painting and decoration, machine woodworking, carpentry and joinery, furniture making, upholstery, catering craft practice, garment making, cosmetology, photography, data processing, store keeping, book keeping, GSM maintenance and repairs, marketing among others (FRN, 2014). All these trades under TVET are structured to prepare trainees for direct entry into the world of work.

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To achieve these laudable objectives, laid down principles are usually adopted. These principles include: ensuring that training is conducted with the same operations, tools, materials and machines as in the occupation itself; and ensuring that individuals are trained in the thinking and manipulative habits required in their chosen occupations. Perhaps, it is this principle that give TVET its meaning and direction.

Therefore, TVET was traditionally meant to prepare persons for an industry- and agriculture-driven economy. This can be traced to industrial revolution era when industrialists and businessmen and women were out to make profit from the soaring industrial sector. To realize this goal, TVET was repositioned to produce compliant and docile workers to ensure efficiency and better returns. This development gave rise to the utilization of stimulus – response learning strategies as way training students to be competent and docile workers (Herrick, 1996). But today's global economy has become highly knowledge-based due of globalization and development in information and communication technology (ICT). Knowledge is no longer slow, limited or stable, knowledge is now dynamic, rapidly expanding and information overloaded. The educational institutions are no longer the sole conduit for knowledge and information acquisition. Presently, there is the internet and a variety of social media which include the following platforms: facebook, instagram, twitter, whatsapp among others. These media platforms are tremendously impacting on education and human life generally, thus the emergence of a knowledge-driven economy. This is indeed a challenge and must be tackled head-on if TVET is to remain relevant in the scheme of affairs.

Concept of Knowledge-Based Economy

Knowledge-based economy was developed to depict a shift from the conventional economies which majorly focused on land, labour and capital as factors of production to ones which are based on information and innovation (intellectual assets) (Okafor, 2017 in Uwameiye, 2020). Okafor added that exploitation of natural resources and adequate manpower were the primary mechanisms of economic growth. Nevertheless, information is now widely understood to be the forthcoming basis of prosperity and notably indicating raw materials, which are transformed using human capital intelligence, into economic growth. Knowledge-based economy is based on economic success or structure that is deep-seated on effective exploitation of knowledge, skills and innovation potentials as the key resources for competitive advantage. Knowledge-based economy comprises the production of goods and services, rooted mostly upon knowledge intensive performance in which a large quantity of economic growth and employment is as a result of knowledge-intensive activities, and it involves the compilation, analysis, and synthesis of information (Grimsby, 2019). Success in a knowledge-based economy requires assurance of both workers and firms to persistently learn and to enlarge their skills and expertise, which will promote innovation.

According to Wokocha (2012), a knowledge-based economy is one that is dependent on production, distribution, and use of knowledge and information. The theory gives a prominent role to knowledge and technology in the pursuit of economic growth. Wokocha added that according, knowledge is codified to: know-what, -why, -how and –who. There are four essential pillars of knowledge-driven economy.

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Pillars of Knowledge-Driven Economy

The pillars essential for a nation (Nigeria inclusive) to fully partake in a knowledge-driven economy as articulated by World Bank (2013) are:

- Education and training: A highly and flexible human capital is vital to compete in the current world and is a core building block of a knowledge-driven economy. This entails exposure and access to quality education such as TVET which determines the proportion of the economy that is literate and skilled. An educated and skilled population is necessary to create, share and use knowledge. TVET is rooted under this platform to equip its graduates in Nigeria with quality saleable skills that will empower them for employment, self-reliant and continue further education;
- Information infrastructure: A dynamic information infrastructure ranging from radio to the internet is imperative to enhance effective communication, dissemination and processing of information;
- Economic incentive and institutional regime: A regulatory and economic setting that allows the free flow of knowledge, supports investment in information and communication technologies (ICTs), and motivates entrepreneurship development is crucial to the knowledge economy. The ICT infrastructure strengthen exposure to the telecommunication sector, which is open to the number of people with ability to use computers and other facilities with access to internet and mobile telephony subscribers' base; and
- Innovation system: A network of research centres, educational institutions, think tanks, private enterprises and community groups are essential to tap into the increasing standard of global knowledge, incorporate and adapt it to local needs and produce new knowledge (World Bank, 2013). Effective use of knowledge in any nation entails appropriate policies, institutions investments and coordination across these four crutches.

Education is the mechanism that drives the knowledge-based economy. According to Growth Engineering (2018), education is an investment in knowledge. Government globally are investing in education, all areas of life should provide opportunities for intellectual growth. The workplace should afford workers and TVET students to keep learning. This implies that learning and development should be the focus TVET and the workplace. Knowledge-based economy has certain characteristics that make it unique as an instructional strategy.

Characteristics of a Knowledge-Based Economy

A knowledge-driven economy has so many defining characteristics. Some of these characteristics according to Wokocha (2012) include: requirement for conceptual, interpersonal and communication skills as the economy no longer relies solely on machines for the production of goods and services. It requires initiative, creativity, problem-solving, flexibility, and continuous learning which include learning by doing, using, and interacting. Also included is the avoidance of excessive specialization of knowledge and skills. In its place, multi-task job responsibilities are being advocated. Other characteristics include: adaptability, ability to construct viable knowledge, self-regulation, and collaboration work skills (ability to work in groups) (Doolitle & Camp, 1999). Blanche (2004) outlined the following as key characteristics of knowledge-based economy:

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- Global: The globe characteristic means that local events are conditioned by global knowledge system. This implies that those trained in a knowledge-based economy can compete globally.
- Networked: This implies that institutions no longer exist as clearly bounded or separate entities, but are immersed in overlapping webs of cooperation and competition. Also, knowledge workers are no longer bound to single institutions.
- Knowledge as a commodity: In a knowledge-driven economy, information is mass produced, packaged, distributed, exchanged and sold as discrete objects. This requires persons to learn to critically consume knowledge products provided by educators.
- Rapid turnover: The value of knowledge decays rapidly in a constantly changing global environment. Thus persons and organizations need to learn how to be up to date with current developments to enable them make contributions in the society.
- Scarcity in abundance: This is synonymous with information overload. Information is freely and abundantly available. Hence people need to learn how to filter use less information, in order to make use of useful one in transforming the economy appropriately.

Persons and organizations need the above mentioned skills to enable them get on in the system or be thrown out of the very fast-moving system. These requirements pose a very big challenge to the core philosophy of TVET. Brunner (2001) stated that educational institutions cannot remain indifferent to the happenings in the environment if it is to remain relevant. A thoroughly developed human capital is the only panacea for wealth creation, and any nation that fails to develop the skills and knowledge of its citizens, and deploy them effectively in the global knowledge-based economy will remain a mere miserable observer (Wokocha, 2012). Thus Brunner (2001) asserted that schooling should be viewed as a venture in life-long learning. It therefore becomes imperative to align TVET with the requirements of knowledge-based economies to enable it fulfil its mandate without let or hindrance. This can be achieved by a shift in paradigm and revisiting the instructional strategies.

Instructional Strategies for Effective Delivery of Technical Vocational Education and Training in a Knowledge-Driven Economy

The content component of curriculum is delivered through instructional models, methods and strategies. Teaching methods are the systematic means of presenting subject matter to achieve set goals. To Onyemerekeya (2008), teaching methods are ways and means of conveying, communicating and inculcating ideas, skills and values implied in the goals and objectives of teaching. Instructional strategies are techniques employed by the teacher to communicate the ideas in a subject in order to achieve the stated objectives. The achievement of instructional objectives in turn is expected to bring about solution to societal problems. A way of addressing the issue of knowledge-driven economy in relation to TVET might be to revisit the instructional strategies presently being employed in TVET delivery with a view to producing employable TVET graduates who are adaptable and capable of operating effectively in a knowledge-driven economy. This is necessary as the current instructional strategies are mainly anchored on the stimulus – response learning theory which does not make for higher-order learning. The present global issues call for teaching strategies that are anchored on constructivist principles. An instructional strategy that needs urgent attention in the current state is the reflective teaching model.

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2. The Reflective Teaching Model

Zakariya (2009) defined Reflective teaching as what you do in the classroom and thinking about why you do it and whether it works – a process of self-observation and self-evaluation. It is the process of thinking about your teaching through self-evaluation and evaluation by your colleagues (Bosire, 2015). It does not mean criticizing yourself but recognizing what is going well and thinking about why it is going well. Bosire opined that teachers' cannot be effective by simply following scripts. Instead their effectiveness lies in their ability to create knowledge – in – use.

Reflective teaching is a process of looking at what you do in the classroom and giving it a meaning by attaching the why question to what you go through (Olitoquit, 2014). The why question is not limited to the teacher, the student is also empowered to ask these why questions to their classroom experiences. Olitoquit added that reflective thinking is a technique that informs the teacher and student that they are in charge of the teaching/learning situation, thus they have crucial contributions to make towards its success. Hence their behaviour must not be taken for granted as it needs to be continuously evaluated to let their actions and experiences be meaningful. Similarly, Serra (2015) described reflective teaching as a personal tool that teachers can use to observe and evaluate the way they behave in their classroom. From the above definitions, it is clear that reflection teaching is the instructional delivery strategy where the teacher closely and critically observes all that goes on in the class. The observation includes both self observation and observation by peers aimed at improving his/her professional practice and the kind of support being offered the students. It enables the teacher to examine his/her work in order to consider alternative ways of ensuring that students learn. It is a constructivist learning approach as it encourages joint construction of knowledge.

Characteristics of Reflective Teaching

There are several approaches to reflective teaching. Zakariya (2009) posited that reflective teaching is characterized by the following steps: (i) planning an activity; (ii) teaching by putting the plan into action; (iii) observing how the lesson goes; (iv) recording your observations; (v) discussing your observations with colleagues; (vi) reflecting on what happened; (vii) revising your plan or making a new one; (viii) putting the revised or new plan up for teaching; (ix) recording and reflecting again, and so on and so on.

Other proponents of reflective teaching identified the following as its key characteristics: (i) perception of a need or identification of a problem; (ii) exploring for relevant information or knowledge; (iii) constructing a meaningful explanation – one that fits in as a solution to the problem; and (iv) confirming the solution through action. This confers on the learner the responsibility for and control of the learning process (Garrison, 2003). Garrison also liken reflective teaching to other higher – order learning constructs such as self – direction and meta-cognition.

Poblele (1999) projected the following six-dimensional reflective teaching model: (i) love of teaching; (ii) knowledge base; (iii) ethics of caring; (iv) artistic problem-solving; (v) inquiring attitude towards education; and (vi) constructivist approach to learning. Constructivist approach to learning refers to teaching and learning as an interactive engagement; an active construction of

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meaning; students as active participants in teaching and learning; and learning as a continuous reconstruction of students' experiences (Poblele, 1999). Other approaches to reflective teaching include: collecting data; analyzing data; evaluating data; reflecting; planning; making decisions; and acting (Olitoquit, 2014). Also, Serra (2015) stated that the key characteristics of reflective teaching include: peer observation and written accounts of experiences. Other characteristics of reflective teaching include: open-mindedness; responsibility; wholeheartedness; activeness; persistent search of information to problems; care and concern for self and others; thinking through difficult issues in-depth; positive and nurturing classroom environment; self-evaluation and evaluation by others; rational; proactive; and healthy scepticism about educational theories and practices (Bosire, 2015).

In all, reflective teaching has been identified as an instructional delivery strategy that is basically characterized by critical thinking, self-inquiry and peer observations about one's teaching practices. It also involves care and compassion towards the student. These change-oriented activities are aimed at maximizing students learning and improving one's professional development.

Benefits of Reflective Teaching for TVET Instructional Delivery in a Knowledge-Based Economy

Reflective teaching has been reported to be beneficial to the student and the teacher in the following ways:

1) It provides learners with concrete examples of how to approach subject matter for purposes of constructing personal meaning;
2) It enables students learn how to manage and monitor their own learning and, in the process demystify knowledge development; and
3) It helps learners gain the ability and confidence for self-directed learning (Gattison, 2003).
4) It also helps them develop reflective and metacognitive skills. By teaching students using reflective teaching strategies it helps them develop higher-order thinking skills by prompting them to: (i) relate new knowledge to their prior understanding (ii) think in both abstract and concrete terms (iii) apply specific strategies to novel tasks, and (iv) understand their own thinking and learning strategies. This way they can develop skills for tackling the complex situations that arise in their everyday life (Hinelo & Ferrai, 1997).
5) It has the capacity to equip students with the skills that will enable them to be competitive in a knowledge-based economy. Such skills include: adaptability, flexibility, resourcefulness, and creativity, which are the skills being sought after by today's world of work the only way to have students improve their work and themselves was by encouraging them to reflect (Herrick, 1996).
6) It has the potential to produce enlightened and flexible workers who will be able to keep pace with industrial and job changes. It imparts in learners the ability for personal growth through the acquisition of higher-level habits and skills.

According to Allen and Miller (1990), when teachers engage in collaborative efforts to address challenges encountered in the classroom, it will help them to:

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- Become more conscious decision makers;
- Acquire skills for working as a network;
- Develop thinking and problem-solving skills;
- Enhance professionalism among the teachers;
- Provide opportunity for teachers to pursue their goal of life-long learning in a more productive way; and
- Support one another in their professional growth efforts, without losing sight of what is required to be effective in individual teachers setting. Reflective teaching ensures teacher professional growth by encouraging deeper understanding of one's teaching and solving problems in a systematic manner. Serra (2015) and Olitoquit (2014) asserted that professional growth is also enhanced as experience is combined with reflection.
- Reflective teaching serves as intrinsic motivational device as it enables the teacher to be empathetic and caring in his/her goal of preparing young people for life in the society (Olitoquit, 2014). Presently, life in the society is widely characterized by knowledge-driven economic structures.
- It can turn a teacher into a researcher because of its dimension of self-inquiry (Olitoquit, 2014). Through self-inquiry, much of what is unknown becomes clear so that the teacher ends up improving his/her practices. Thus reflective teaching can serve as a professional alternative to action research.
- By engaging in critical reflection as a way of exploring their own teaching, teachers develop changes in attitudes and awareness which can benefit their professional development and improve the kind of support they provide their students.

From the above, it can be said that reflective teaching helps students acquire the skills needed to function effectively in a knowledge-driven economy. It also helps teachers deliver their professional practice in such a way that will impart in students the skills required for tackling daily issues.

Reflective Teaching Limitations

As promising as reflective teaching may be, it does have limitations, which include:

1) Considerable demand on time: With the use of journal writing, self inquiry and reporting, peer observation, the practice of reflective teaching can be very time consuming. Clearly, the practice needs more time than the normal school system can afford.
2) Reflective teaching appears more effective on written communications. This is opposed to the manipulative skills required for success in TVET and the related disciplines.
3) It requires patience and careful observation of the entire lesson experience.

With teachers' poor working conditions, one wonders how they can effectively implement reflective teaching with all its demands on critical resources such as time, money and energy. The issues of working conditions of Nigerian teacher have been articulated by Anaele and Igboko (2014) as follows:

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- The teacher as a Facilitator or Midwife of knowledge: the responsibility of facilitating knowledge imposed on the teacher is quite demanding. The truth is that the Nigerian teacher is ill-disposed to face the challenge. The present mode of learning draws heavily on metacognitive principles where the teacher is at the core of all effort aimed at cultivating and maintaining functional skills in learners. This responsibility cannot be taken for granted if TVET objectives are to be achieved. So much have been said about the life and professional conduct of the Nigerian teacher. How does the learner in TVET classroom perceive the teacher? This perception may either encourage or discourage active participation in class activities. Active participation is demonstrated through paying attention and adequately showing commitment to classroom/workshop/ laboratories activities. Walklin in Anaele and Igboko (2014) perception is the interpretation of the main features of something or action based upon previously categorized information and stored in one's memory. A teacher's personality traits govern to an extent, his/her ability to encourage rapport. Teacher-learner relationships in the classroom/workshop/laboratories are vital factors in the process learning. Leeds (2003) asserted that 55% of what one feels about somebody is a function of how the person looks. The factors of attention, commitment and positive attitude are instilled in the learner through a careful and diligent discharge of duties, cheerful, confident and relaxed outlook. This is only possible through teacher's job satisfaction. Anaele and Igboko (2014) asserted that teacher's conditions of service do not permit him/her to respond adequately to the demands of life. This situation impacts on the teacher's outlook and output. Incidentally, TVET requires strong commitment, devotion and attention of the learner. Since the development and maintenance of sound metacognitive skills in TVET students is a critical factor, it becomes almost impossible to achieve its objectives if the teacher's knowledge and skills are not properly addressed.
- The curriculum: A look at the current TVET curriculum reveals that it is cluttered, overloaded and unrealistic. TVET teachers in a bid to cover its entire content, which is almost impossible, end up scratching its surface. The designers of the TVET curriculum prepared the document with the hope of turning out graduates who will be employable or self-reliant. TVET curriculum should not be overloaded, but critical areas that will help put a match to between TVET and the workplace requisite knowledge and skills needed for the knowledge-driven economy should be emphasized.
- Learner's socio-cultural background: Culture is the total way of life of a people. Ikpo (2008) stated that culture include the shared beliefs, customs, practices and social behaviour of a people. Unanka (2001) posited that it is common knowledge that the technology component of Nigerian culture is poor. This the author attributed to the prevalence crude oil which has created severe tension in the polity. TVET has been relegated to the background. The way forward is to cultivate and building a scientific, technological and industrial culture and attitudes among learners in order for Nigeria to attain greater heights in a knowledge-driven economy.

3. The Way Forward

Having found that the potentials of reflective teaching are consistent and in complete agreement with the requirements of a knowledge-driven economy, the following are suggested towards integrity reflective teaching strategies into the teaching of TVET:

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1) Questions in the 'what' and 'why' domains should be preferred to those in the 'how to' domain. This will give the teacher power over his/her teaching, and the learners' autonomy and responsibility for the construction of their own meaning.
2) Teachers should constantly question their aims and actions because they need to be clear on what they want to achieve and how they intend to achieve it.
3) The curriculum of TVET should include training on effective communications in an increasingly technical and knowledge-driven environment. It should also include training on willingness to take on responsibility, collaborative work skills, innovation, critical thinking and problem-solving.
4) TVET curriculum should be restructured to include skills development within a learning environment. Learning environment consists of learning by doing, using and interacting. This will help TVET students view schooling as a venture in life-long learning.
5) TVET should be made to adequately transform existing industrial systems through the adoption of suitable teaching strategies including reflective thinking.
6) The teacher should act as a facilitator since the process of inquiry and reflection require an atmosphere of freedom and support. The learners should assume responsibility and control of the learning process while learning outcomes or depth of understanding should be assessed collaboratively.
7) Again TVET curriculum should be restructured to emphasize local needs but with global outlook. This is because in a knowledge-driven economy, local events are shaped by global knowledge systems.
8) TVET curriculum should also include training on soft skill which constitutes the basic building blocks for more sophisticated economic structures.
9) The welfare of the teacher in whose shoulders lies the implementation of the reflective teaching strategy should be looked into. This will enable them to give of their best.
10) TVET should be adequately funded as reflective teaching requires enormous resources. To this end, Edu and Effiong (2013) reported inadequate funding or none at all, will make the realization of educational objectives difficult.

4. Conclusion

Knowledge in recognition of the fact that current global economy has become prominently knowledge- driven as against industrial economies that held sway in the past. This paper has solicited for a TVET teaching strategy whose merits are consistent with the requirements of a knowledge-driven economy to ensure that TVET graduates are able to operate effectively in a global world of work. To this end, this paper discussed TVET, knowledge-based economy and reflective teaching. Since the merits of reflective teaching were found to be congruent with the characteristics of a knowledge-based economy, some suggestions were made to facilitate the integration of reflective teaching principles into TVET curriculum.

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