# Innovation in Tertiary Education

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A B S T R A C T

*Tertiary education is currently confronted by global forces that necessitate innovative research, innovative pedagogies, and innovative structure. For these reasons, I suggest that a theoretical understanding of innovation is important for tertiary educations continued development in the twenty – first century. Good innovation from a variety of academic disciplines. This paper discussed these issues from the standing point of the vision and mission of creative and innovation are generated through the clarification of several terms that are related to innovation. I discussed the concepts of sustainable and disruptive innovation has been a consistence fixture of tertiary education since its inception. Then I consider three dimension of innovation: diversity, intrinsic motivation and autonomy duals working within tertiary education to be innovative. Lastly, I address three additional concepts time, efficiency and trust that are important for a thorough consideration of innovation within an institutional environment.*

A R T I C L E I N F O

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## INTRODUCTION

Many authors have lamented this lack of consensus concerning a single, unifying definition of innovation (Adams, Bessant, and Phelps, 2006; Cooper, 1998 ;Zairi, 1994). However, the current popularity of innovation may be attributable to its transfer ability and reconceptualization across different disciplinary areas, time periods, and cultures. Godin (2014) has persuasively argued that innovation, when viewed as a phenomenon of intellectual history, should, in fact, be deliberated as a "concept" rather than as a static word with a fixed meaning in time. According to the German historian and linguist Reinhart Kos5elleck (1972), concepts differ from words in that they are subject to a wide range of semantic meanings that are dependent upon context. Due to this enlarged theoretical space, concepts require a well-defined contextual field and a lexicon of interconnected terms for meaning. In this chapter, tertiary education serves as the contextual field for our exploration of innovation. Although I am primarily focused on the contemporary landscape of Nigeria tertiary education, I will suggest that the discussion is relevant to universities around the Nigeria, and, of consequence, we make reference to international contexts when appropriate. As i said on this paper, tertiary education is currently confronted by global forces that

necessitate innovative research, innovative pedagogies, and innovative organizational structures. While some may consider these changes to be a threat to traditional academic life, innovative research can provide immeasurable benefits to society in the form of medical and technological breakthroughs, inventions that improve global sustainability, and interdisciplinary ventures that raise the quality of life for millions, particularly in poverty-stricken regions (Khavul and Bruton, 2012). Innovative pedagogical methods and modes of delivery are likely required to match the dynamic interplay between workforce development and tertiary education, especially in developing countries (Goddard, 2012). Meanwhile, government demands for greater efficiency in national

Tertiary education sectors may compel a need for innovative institutional structures (Powell, Gilleland, & Pearson, 2012). For these reasons, I suggest that a theoretical understanding of innovation is imperative for tertiary education's continued development in the twenty-first century. Good innovation literature from a variety of academic disciplines, this paper outlines a conceptual framework in five sections. In the first section, we delineate four imminent trends in tertiary education that may compel innovative responses. First, knowledge-intensive trade has become vital to economic development in the twenty-fi rst century. Second, the astonishing development of technological and computerized systems threatens to undercut job sectors relating to transportation, logistics, support, production, construction, and service (Frey & Osborne, 2013). Due to both of these factors, tertiary education will need to play a central role in developing creative and social intelligence skills in both younger and returning older students so that they might have viable talents for future labor markets.

Third, many national tertiary education sectors across the globe, particularly in developing countries, may engage in deliberate massification strategies that reflect these changing workforce demands. At the very least, a period of dynamic change.

**Conceptualizing Innovation**

Concerning enrollment patterns is likely on the horizon. Fourth, government funding for tertiary education in many nations is being cut, especially in Nigeria, even while educational quality remains a priority and change seems inevitable.

After making a case for innovation's importance to tertiary education, I address creativity and innovation. In this second section, creativity is defined as inventiveness grounded in field-specific knowledge and expedited by motivation. Innovation is defined as the implementation of a creative product or process and its perceived novelty once it has been evaluated by a critical audience.

Entrepreneurship is defined as an organizational activity and/or creative process that is reliant upon innovation, but primarily motivated by the potential for capital gain. Since these terms are frequently conflated by scholars, we interrogate their relationship with innovation to demonstrate how they are interconnected on individual and organizational levels, as well as to demarcate their differences.

In the third section, I contend that change and innovation has been a consistent fixture of tertiary education since its inception, even though artifacts and rituals that celebrate continuity and tradition pervade college and university campuses. buttress this argument, I demonstrate how tertiary education has traditionally adopted what i shall defne as " sustainable " innovations that induce incremental change to keep pace with developments in greater society. In contrast, what i call "disruptive" innovations have fundamentally transformed other industries through a combination of simplicity, affordability, convenience, and novelty but have hitherto left tertiary education unscathed. While many predict that disruptive innovations, such as online education, are destined to dramatically change the landscape of tertiary education, I caution that universities are different from businesses in that they rely upon the accrued prestige, often established over decades, of their faculty and their departments for legitimacy. Hence, the rhetoric surrounding disruption should be judged in a critical manner, even while the theory of disruptive innovation may prove useful for understanding the emergence of new educational paradigms.

In the fourth section, we consider three dimensions of innovation – diversity, intrinsic motivation, and autonomy – that positively impact the ability of individuals working within tertiary education to be innovative. Numerous studies indicate that organizations employing a diverse group of individuals are more innovative.

Diversity is defined here by both "inherent" attributes, such as race and sexual orientation, and "acquired" attributes, such as an individual's areas of developed expertise and cultural knowledge (Hewlett, Marshall, and Sherbin, 2013). Incentive are a form of extrinsic motivation frequently employed in the invention and implementation stages to reward desired behavior and direct resources towards predetermined goals; however, research by psychologists demonstrates that tapping into an individual's intrinsic motivation is a more effective avenue to stimulate creative and innovative thinking (Deci, Ryan, and Koestner, 1999 ). Related to incentives is the issue of autonomy. One trend that threatens to inhibit innovation in tertiary education is the increasing prevalence of evaluative processes that are excessively focused on.

At the organizational level, a diverse range of backgrounds, proficiencies, and voices augments the creative impulses of individuals, as well as the innovative potential of a group. Feldman (2002), in fact, contends that "innovation, at a fundamental level, is a social process that bridges individuals from different disciplines with different competencies, distinct vocabularies, and unique motives". Diversity is sometimes considered in terms of inherent characteristics, such as race or gender. Indeed, research on inherent diversity indicates substantial financial returns for companies that actively promote diverse hiring practices, especially in leadership positions. Hunt, Layton, and Prince (2014), for instance, discovered that the top quartile of companies in terms of gender diversity in corporate leadership are 15 % more likely to be above the national industry median for financial returns. The top quartile of companies for ethnic diversity in corporate leadership is 30 % more likely to rise above the national median.

Additionally, Hewett, Marshall, and Sherbin found that a diverse leadership enables employees to propose novel concepts and understand the perspectives from a more diverse range of clients. Leaders also were more likely to expedite feedback channels, ensure that multiple voices were heard, and delegate authority. Each of these behaviors helped both leadership and employees fulfill their innovative potential to a greater degree than they would in a less diverse environment. Externally-derived measures of assessment. To nurture an innovative climate in colleges and tertiary education, i maintain that a certain degree of autonomy is necessary. As the fifth and final section of this paper elaborates, three additional concepts are important for a thorough consideration of innovation: time, efficiency, and trust.

Time is intricately correlated with the implementation process, and it is subject to a complex array of considerations that are unique to each innovative project. The predominantly negative, and occasionally positive, effects of efficiency on innovation are also explored. Trust is also a complicated dimension, as it can have positive and negative effects on innovation. Most importantly, however, trust enables individuals within an institution to embrace diversity, facilitate intrinsic motivation, and allow talented innovators to enjoy the privilege of autonomy. This level of trust has to be engendered by an environment that allows for an open discussion of ideas even when opinions diverge. As such, i argue that an innovative university needs to carefully consider how to manage the temporal aspects of an innovative process, balance the demands for efficiency with the need to adequately supply innovative institutions and researchers, and generate the conditions for trust so that resources are allocated appropriately and innovative inquiry can transpire.

**Issues Confronting Tertiary Education**

If the intensity with which global forces are compelling change is exceptional, innovative responses are needed. To maintain their relevance in contemporary society, many universities will need to carefully cultivate their respective identities while responding to turbulent external and internal pressures in which inherited philosophical beliefs and organizational structures are likely to be challenged. This section is not intended to be a comprehensive overview of challenges that tertiary education may face in the foreseeable future. Nonetheless, we do believe four explicit developments in the tertiary education landscape are worthy of consideration when thinking about innovation.

**Intrinsic Motivation**

In a university, researchers are frequently incentivized by the promise of enhanced disciplinary prestige,

additional income, and/or institutional promotion. An additional worldwide trend in tertiary education is the expansion of performance-based funding through incentive arrangements, such as research grants. For many, including several economists (Bénabou & Tirole, 2003; Scotchmer, 2004), these types of extrinsic motivators are necessary tools for rewarding exemplary work and for encouraging desired behaviors.

**Autonomy**

Psychological research has identified a particularly strong relationship between intrinsic motivation and autonomy. In fact, Fisher (1978) and Ryan (1982) each discovered that an individual who feels competent enough to perform a given task, yet lacks a sense of autonomy, will not experience the intrinsic motivation necessary to complete the undertaking. Thus, autonomy is required for innovation in tertiary education. Researchers working for a university are highly-skilled disciplinary experts who can draw upon their knowledge to construct the best plan of action for achieving a desired outcome. In management literature, the degree of autonomy an actor receives is sometimes portrayed as a "coordination-autonomy dilemma" (Puranam, Singh, & Zollo, 2006). However, a production line mentality that requires workers to meet particular standards throughout their workday would not stimulate an innovative climate in tertiary education. To preserve autonomy, academic freedom is essential. Researchers need the liberty to debate concepts and investigate theories without fear of censorship or rebuke for an "incorrect" or an "unproductive" outcome.

**Time**

Therefore, the connection between time and innovation can be considered in one of three ways: (1) the rate of development ; (2) the moment in which an innovation is unveiled to the public; and (3) the rate of adoption or acceptance by a given participant base (Dodgson and Gann, 2010 ). These three stages provide a useful framework for considering the viability of an innovative idea, the resources necessary to realize the development of an innovation, and the likelihood of an innovation's adoption or acceptance by targeted audiences. Individual disciplines may have different expectations concerning the rate of development for an innovation. For instance, a discipline that deals with continuous technological advancements, such as the digital humanities, may expect new innovative discoveries on a yearly, if not monthly, basis. Conversely, tertiary education may take several years to develop a new drug in partnership with a pharmaceutical company. They may also need to anticipate an extended period of time to ensure safety through multiple drug trials.

**Efficiency**

In certain situations, a focus on efficiency can stimulate creative solutions to demanding problems, especially if resources are limited. Generally, though, efficiency is a disincentive that precludes innovative inquiry. Some even contend that efficiency is the "enemy of innovation" (Janeway, 2012), as it negatively impacts the trial and error process necessary for innovation. A reluctance to fund promising research and adequately regulate the tradeoff between efficiency and innovation has triggered significant losses for companies like Motorola, Ericsson, and Samsung (Christensen and Raynor, 2003).

**Trust**

Research concerning the intersection of innovation and tertiary education usually focuses on institutional structures. Weick (1976), for instance, postulated that educational organizations might be "most usefully viewed as loosely coupled systems" Among many characteristics, these systems are distinguished by their lack of coordination, relative absence of regulations, infrequent inspection of activities, and overall decentralization.

If an educational institution is indeed loosely coupled, then what enables the independence and decentralization necessary for our conceptual framework of innovation? As stated by

Molina- Morales, Martínez-Fernández, and Torló (2011), the literature on trust indicates the following:

*Trust helps facilitate cooperation, lowers agency and transaction costs, promotes smooth and efficient market exchanges, and improves firms' ability to adapt to complexity and change. This stream of research holds that firms can find a wealth of benefits from trust, including cost savings and enhanced organizational capacities*

Thus, trust can be a crucial animating force that allows talented innovators to enjoy the privilege of autonomy, thereby also enabling intrinsic motivation. In diverse setstings, trust can also foster collaboration, allowing for the sharing of information and expertise, rather than siloed knowledge and resources that would occur in a less trusting environment (Ahuja, 2000; Daft and Becker, 1978; Tsai and Ghoshal, 1998). According to Powell, Koput and Smith- Doerr (1996), innovation may even depend on the relationships that can be forged by individuals from discrete backgrounds.

INNOVATION IN TERTIARY EDUCATION HAVE CONTRIBUTED TO SUBSTAINABLE DEVELOPMENT IN NIGERIA

1. Technological innovations in tertiary education has served as substitute to imported technological equipment in Nigeria
2. Mechanical equipment innovations has served as substitute to imported mechanical equipment in Nigeria
3. Agricultural equipment innovations has helped in providing additional equipment for food processing in Nigeria
4. Teaching innovations has helped in improving the quality of teaching in Nigeria educational sector
5. Farming techniques innovations has helped in boosting the agricultural productivity in Nigeria
6. Medical treatment innovations has helped in improving and augmenting treatment provided in Nigeria hospitals
7. Business management techniques/innovations has helped to guarantee effective business management in Nigeria.

CHALLENGES LIMITING INNOVATIONS TO ENHANCE SUSTAINABLE DEVELOPMENT IN TERTIARY EDUCATION IN NIGERIA

1. Non-availability of road map for adoption of creative innovations in tertiary education in the society
2. Inappropriate quality appraisal/insurance of creative innovations in tertiary education for societal use
3. Non-awareness of creative innovations in Nigeria tertiary education by the general public
4. Lack of support for creative innovations from the public and private sectors
5. Under valuation of creative innovative capacities of tertiary education in Nigeria
6. Pressure from global society has limited the acceptance of creative innovations from Nigeria tertiary institutions for use
7. Lack of sufficient funding to sustain the quality of creative innovations in Nigeria tertiary institution

RECOMMENDATIONS

MEASURES GOVERNMENT TO BE ADOPTED TO ENSURE CREATIVE INNOVATIONS ENHANCE SUSTAINABLE DEVELOPMENT IN NIGERIA

1. Government should set appropriate standards for quality appraisal! Assurance of creative innovations tertiary institutions in Nigeria
2. Government should ensure that all tertiary education institutions are responsive to society equipment/knowledge needs
3. Government should ensure that companies and organizations from the sectors are considered when programmes are designed
4. Government should provide measures to ease cultural and structural barriers both to attract foreign students and researchers to creative innovations exhibitions in the country for international recognition of the creative innovations
5. Government should build attractive research environments in tertiary institutions with the availability and quality of research infrastructure

6. Government should maintain and update regularly research infrastructure, instruments and equipment
7. Government should establish collaborative policies across countries for the recognition of creative inventions in Nigeria tertiary institutions
8. Government should develop collaboration between the tertiary education sector and firms and public research organizations to improve knowledge diffusion
9. Government should provide incentives to facilitate inter-sectoral mobility between Finns, public research organizations and tertiary institutions
10. Government should make research support grants available to researchers creating inventions that will aid sustenance and development of Nigerian economy.

**Summary**

Each of the three dimensions – time, efficiency, and trust – discussed in this section require deliberation about an institution's goals, priorities, and culture. While efficiency is generally seen as an "innovation killer," it can also stimulate creative thinking. In general, however, "empowering innovations" that can have the greatest impact on society require considerable time to develop and implement. Since grants typically run for less than 5 years, governments and institutions may want to make lengthier financial commitments, depending on the intended scope and impact of a given project. For such long-term projects, there is a tendency to micromanage the activities of researchers. Hence, trust is of major importance, since it diminishes the need for bureaucratic impediments that can increase expenses and stifle creativity.

**Conclusion**

As I argued in this paper, a greater understanding of and appreciation for innovation is necessary for the future of tertiary education. If different career competencies are indeed necessary for success in a twenty-fi rst century knowledge-based society, tertiary education will need to be innovative to equip workers with valuable skills, especially in the face of reduced state funding. Institutional ambition will also require innovative thinking grounded in the realities of regional needs. Not every institution needs to become world-class, but every institution should support innovative research, organizational structures, and pedagogical approaches that can provide assistance to individuals outside of academe.

Professors are enculturated through graduate training to be critical thinkers and challenge accepted views. As a result, tertiary education are uniquely positioned to grant autonomy and tap the intrinsic motivation of researchers. Without this skepticism and interrogation, disciplinary progress and innovation cannot, in fact, take place. Novelty is only one aspect of innovation, however. The process of implementation, at times, may require a greater willingness to engage in interdisciplinary research, a capacity to embrace diverse backgrounds and viewpoints, and a thorough consideration of how to effectively nurture trust between different institutional levels and individuals. The demands for efficiency voiced by many actors outside of education may also compel a more entrepreneurial attitude, balanced by a recognition that the most effective innovations necessitate time and the privilege of deep reflection. Whether the majority of innovations in the future are largely sustainable or increasingly disruptive, change for tertiary education is likely on the horizon. This paper provides a conceptual framework that can be refined as future studies examine innovation in a variety of tertiary education environments. Through this continued investigation, institutions will be better equipped to create and implement novel research that can positively impact society and advance human knowledge.

**References**


1. Adams, R., Bessant, J., & Phelps, R. (2006). *Innovation management measurement:* A review. International Journal of Management Reviews, 8 (1), 21–47.
2. Ahuja, G. (2000). The duality of collaboration: *Inducements and opportunities in the formation of interfere linkages.* Strategic Management Journal, 21 (3), 317–343.
3. Bénabou, R., & Tirole, J. (2003). Intrinsic and extrinsic motivation. *Review of Economic Studies*, 70 (3), 489–520.

4. Christensen, C. M., & Raynor, M. E. (2003). The innovator's solution: *Creating and sustaining successful growth*. Boston: Harvard Business School Press.
5. Daft, R. L., & Becker, S. W. (1978). *The innovative organization*. New York: Elsevier.
6. Deci, E. L., Ryan, R. M., & Koestner, R. (1999). *A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation*. Psychological Bulletin, 125 (6), 627–668.
7. Feldman, M. P. (2002). *The internet revolution and the geography of innovation*. International Social Science Journal, 54, 47–56.
8. Fisher, C. D. (1978). *The effects of personal control, competence, and extrinsic reward systems on intrinsic motivation*. Organizational Behavior and Human Performance, 21 (3), 273–288.
9. Frey C. B., & Osborne, M. A. (2013). The future of employment: *How susceptible are jobs to computerization?* Oxford: University of Oxford, Oxford Martin School.
10. Goddard, B. (2012). Future perspectives: *Horizon 2025. In D. V. Davis & B. Mackintosh (Eds.), Making a difference: Australian international education*. Sydney, Australia: University of New South Wales Press.
11. Godin, B. (2006). The linear model of innovation: *The historical construction of an analytical framework.* Science, Technology, and Human Values, 31 (6), 639–667.
12. Godin, B. (2008). In the shadow of Schumpeter: *W. Rupert Maclaurin and the study of technological innovation. Project on the Intellectual History of Innovation*, 2, Montreal: INRS. Retrieved from http://www.csiic.ca/pdf/intellectualno2.pdf
13. Godin, B. (2014). The vocabulary of innovation: *A lexicon. Project on the intellectual history of innovation, 20, Montreal: INRS*. Paper presented at the 2nd CASTI workshop, Agder, Norway. Retrieved from http://www.csiic.ca/PDF/LexiconPaperNo20.pdf
14. Hewlett, S. A., Marshall, M., & Sherbin, L. (2013). *How diversity can drive innovation. Harvard Business Review.* Retrieved from https://hbr.org/2013/12/how-diversity-can-drive-innovation
15. Hunt, V., Layton, D., & Prince, S. (2014). *Diversity matters.* New York: McKinsey & Company. Retrieved from http://www.mckinsey.com/~/media/McKinsey%20Offices/United%20Kingdom/PDFs/Diversity_matters_2014.ashx
16. Janeway, W. H. (2012). Doing capitalism in the innovation economy: *Markets, speculation, and the state*. New York: Cambridge University Press.
17. Khavul, S., & Bruton, G. D. (2012). Harnessing innovation for change: *Sustainability and poverty in developing countries*. Journal of Management Studies, 50 (2), 285–306.
18. Koselleck, R. (1972). Begriffsgeschichte and social history. *In R. Koselleck (Ed.), Futures past: On the semantics of historical time* (pp. 75–92). New York: Columbia University Press.
19. Powell, B. A., Gilleland, D. S., & Pearson, L. C. (2012). *Expenditures, efficiency, and effectiveness in U.S. undergraduate higher education*: *A national benchmark model*. Journal of Tertiary Education, 83 (1), 102–127.
20. Powell, W. W., Koput, K. W., & Smith-Doerr, L. (1996). *Interorganizational collaboration and the locus of innovation: Networks of learning in biotechnology*. Administrative Science Quarterly, 41 (1), 116–145.
21. Puranam, P., Singh, H., & Zollo, M. (2006). Organizing for innovation: *Managing the coordinationautonomy dilemma in technology acquisitions*. Academy of Management Journal, 49 (2), 263–280.
22. Ryan, R. M. (1982). *Control and information in the intrapersonal sphere: An extension of cognitive evaluation theory*. Journal of Personality and Social Psychology, 43 (3), 450–461.
23. Scotchmer, S. (2004). *Innovation and incentives. Cambridge*, MA: MIT Press.

24. Tsai, W., & Ghoshal, S. (1998). Social capital and value creation: *The role of intra firm networks*. Academy of Management Journal, 41 (4), 464–474.

25. Weick, K. E. (1976). *Educational organizations as loosely coupled systems. Administrative Science Quarterly*, 21 (1), 1–19.

26. Zairi, M. (1994). Innovation or innovativeness? *Results of a benchmarking study*. Total Quality Management, 5 (3), 10–16.