Mediation effect of novelty ecosystems on intrapreneurial behaviour process within an organisational dynamic environment among Kenyan universities

A complexity approach

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Abstract

Purpose – The purpose of this paper is to examine, explain, predict and guide the processes, mechanisms and outcomes of intrapreneurial behaviour to provide evidence that novelty ecosystems mediate the relationships between generative influence, positive deviance and intrapreneurial behaviour. It also enlightens the capacity of replicating the intrapreneurial best practices.

Design/methodology/approach – The study uses an integrated approach of entrepreneurship and complexity theories. Its subjects were full-time designated university employees in the Republic of Kenya. A total number of 244 employees were selected using snowball sampling technique from ten public and private universities in the Kenya. A self-administered questionnaire was used to collect data.

Findings – The structural equation modelling path analysis and the bootstrapping results confirmed full mediation of novelty ecosystems in the relationship between generative influence and intrapreneurial behaviour. The findings, further, verified that novelty ecosystems partially mediate the relationship between positive deviance and intrapreneurial behaviour.

Research limitations/implications – Subjective appraisals were used, despite the fact that studied variables are ultimately based on what employees perceive. Future research should generate and include more objective measures.

Practical implications – Intrapreneurial behaviour can only be explained and predicted through novelty ecosystems. University leaders need to fully understand and facilitate novelty ecosystems.

Social implications – A deeper understanding of the power of generative influence, positive deviance and novelty ecosystems will not be fully realized until researchers devote as much energy and attention to facilitation as has been devoted to conflict.

Originality/value – This study extends existing intrapreneurial research into complexity approach.

Keywords Complexity, Complex, Positive deviance, Intrapreneurial behaviour, Generative influence, Novelty ecosystems

Paper type Research paper

Introduction

While change is a constant feature of organisational life, the tendency to see generated opportunities and cope with emanating events is seen as intrapreneurial behaviour (IB) (Lindhult and Hazy, 2014; Hazy, 2013; Morris *et al.*, 2011; Goldstein *et al.*, 2010). The Co-evolution Journey from a tiny Department of Commerce in Makerere University (MAK) to a leading Business School (MUBS) in East African region demonstrates this practice and how it was fostered by generative leadership.

Background: best practice and co-evolution story introduction

Waswa J. Balunywa, one of the employees at the age of 28 years, early in 1983, shared and influenced his colleagues in the department of commerce to pursue the fee-paying students venture. His focus was on the possibility of exploiting the idle resources through a private students' enrolment scheme. Despite the fact MAK was surrounded by emerged lacklustre chaos[1] (Mamdani, 2007; Musisi and Muwanga, 2003), there was a lot of resistance to allow this change of action (Mamdani, 2007). Nevertheless, some individuals identified and took advantage of the idle resources. They influenced their colleagues to focus on exploiting such opportunity as viable solutions to the then prevailing university challenges (Mamdani, 2007; Musisi and Muwanga, 2003; Gregorian *et al.*, 2003; Court, 1999). Soon workshops and seminars, short courses, and eventually, evening study programmes for private students emerged from such activities.

Within a decade, student enrolment soared from 108 students in 1992 to 1,287 students in 2002 (1,191 per cent) and to 16,000 students ten years later (1,243 per cent). This made MUBS, the leading, growing and biggest business faculty/school in MAK and in the region at large. For example, out of MAK's 35,000 students in 19 faculties, 45.7 per cent were from MUBS. MUBS became the regional centre of business knowledge with over 4,000 graduates entering the job market annually. In MAK, several units did not only utilise the available resources but also expanded their academic menu to more than 280 fully fledged academic programmes. Such menu with attractive study options was able to respond to the newer need that was available in the market. These events steered MAK's reorganisation and transformation. The university became less dependent on the state, and the sorry state of affairs at MAK improved (Musisi and Muwanga, 2003; Gregorian *et al.*, 2003; Court, 1999), and the World Bank praised the reform as a "quiet revolution" (Bisaso, 2011).

One prominent aspect evidenced in this case study is ecosystem[2] and changes. Academia posits that ecosystem-mediating effects are key features within which organisations operate, given the ever-shifting events (Lindhult and Hazy, 2014; Hazy, 2013; Cawsey *et al.*, 2012; Morris *et al.*, 2011).

Pinchot (1987) and Kanter (1983) testify that radical changes, which take place in organisations, are not strategically controlled. In many cases, such changes are stimulated by bottom-up frontrunners rather than top-down. One of the key characteristics of intrapreneurial strength is such bottom-up influence. Pinchot (1987) claims that forces or agents of change in large organisations often change things in opposition. Kanter (1983) demonstrates that in order to nurture the quality of bottom-up generative influence (GI)[3], organisational leadership ought to set up systems that permit intrapreneurs. If this is not controlled well through super-strategic management structures, it may inject chaotic forces into a stable system (Farazmand, 2003).

Theoretical framework

This study utilises two theories and focusses on four variables: GI, positive deviance (PD)[4], novelty ecosystems (NE) and IB.

Theory of entrepreneurship

The theory of entrepreneurship was selected to reinforce ways of understanding IB in terms of opportunity identification and exploitation stimulated by motivations, environmental events, specific tasks and cognitive effects. Academia uses this theoretical explanation on linear cause-effect relationships between variables (static complex)[5] with less emphasis on non-linear interactions or dynamic complexity[6] (Frese and Gielnik, 2014; Lindhult and Hazy, 2014; Hazy and Uhl-Bien, 2013a; Morris *et al.*, 2011; Hazy, 2010). Shane's entrepreneurship theory ignores the role of GI, an essential element in explaining IB (Kuz, 2011, 2010). Casson (2005) also contends that the theory of entrepreneurship puts slight and indirect measures on GI as a stimulant to opportunity tension (Goldstein *et al.*, 2010). It does not address the ability to see dynamism as stability and to work with that dynamism to achieve a more adaptive motional state. This theory is unable to acknowledge that a metamorphosis (transformation) state requires individuals who can facilitate and regulate interaction resonance and exchange rules governing changes in perceptions (Frese and Gielnik, 2014; Kuratko, 2010; Anderson and West, 1998).

Complexity systems leadership theory

The other theory advancing reasons for IB is the complexity systems leadership theory (Lindhult and Hazy, 2014; Goldstein *et al.*, 2010; Hazy, 2013). Hazy (2010) posits that higher levels of innovation could only be achieved through the emergent NE[7]. Goldstein *et al.* (2010) argue that creating such ecosystems could be made possible by interaction resonance or symbiotic behaviour/practice across the university setup (GI). These further contend that unfolding series of events alertness tend to stimulate opportunity tension, trigger opportunity recognition, prompt opportunity evaluation and consequently opportunity exploitation (opportunity – "TREE") (Haynie *et al.*, 2009; Shane, 2003).

Statement of opportunity

Tertiary institutions are complex dynamic systems that exhibit unstable interactive behaviour patterns (Gibb *et al.*, 2014; Ong, 2008). These demand explanations based on integrating the "two lens": the existing linear complex classical and scientific intrapreneurship behaviour explanations – assumed by entrepreneurship theory (Lindhult and Hazy, 2014; Hazy and Uhl-Bien, 2013a) with complexity (non-linear) interactions – assumed by complexity systems leadership theory (Frese and Gielnik, 2014; Hazy and Uhl-Bien, 2013b).

Integrating a combination of entrepreneurship theory and complexity systems leadership theory may offer a better IB explanation and predictability amidst bureaucratic rules or procedures (Lindhult and Hazy, 2014; Heskett, 2011).

The focus of the study

This study explored, examined and explains IB and change in a complexity environment. The study used the World Bank report on MAK out-of-chaos transformation case study to provide a narrative episode of change effected by IB among employees in a university setting (Court, 1999). A survey was also conducted on other universities in a similar setting to verify the results. The focus was on the role of mediation effect on the relationship between GI, PD and intrapreneurship behaviour.

It also examined two features of intrapreneurship behaviour that are under explored: GI and PD within a complexity setting. In general, literature advanced two fundamentally diverse theoretical explanations to this phenomenon. Some explanations are complex whereas others are complexity (Hazy and Uhl-Bien, 2013b; Goldstein *et al.*, 2010; McMillan, 2008). The existing classical and scientific intrapreneurship behaviour arguments were grounded on linear cause-effect relationships between variables (static complex) with less

emphasis on non-linear interactions (dynamic complexity) (Frese and Gielnik, 2014; Lindhult and Hazy, 2014; Hazy and Uhl-Bien, 2013a). Yet, organisations are made of complex dynamic systems that exhibit unpredictable interactive patterns and behaviours. Recent academia increasingly supports the need of integrating the two approaches in explaining intrapreneurship behaviour among employees (Gibb *et al.*, 2014; Ong, 2008; He and Wong, 2004).

Taken together, this study extends existing intrapreneurial research into complexity approach in a dynamic environment by focussing on the following hypotheses:

H7. There is positive relationship between GI and intrapreneurship behaviour among employees.

H5. It was postulated that NE mediate the relationship between GI and intrapreneurship (Figure 1).

Hypotheses development
GI, NE and IB
Literature has it that GI (and not any one individual) plays a significant role in facilitating an environment that is conducive for the exploration and experimentation of unfolding series of events emerging at every level in the university to foster the emerging novelty new routines, methods, processes and ecosystems compliance. It is by these exploration and through experimentation that innovation grows even through a small "cutoff" in technology (McMillan, 2008). GI makes these "events" to be known, gets selected, and is then reinforced through series of additional events (Goldstein *et al.*, 2010). Complexity science academia reveals that positivists' employees are key antecedents for intrapreneurship behaviour. Chaotic conditions within sensitive and highly responsive systems accompanied by GI can generate opportunity tension in university (Goldstein *et al.*, 2010; McMillan, 2008) and in particular among employees (Ssejjemba and Karuhanga, 2012). This had been confirmed by studies on dynamic systems (Kellert, 1993), which reported that most seemingly disorderly or non-linear systems involve elements of order and a kind of unexpected stability (McMillan, 2008).

Scholars emphasise that for any organisation to evolve, it requires employees with a high degree of interaction resonance or symbiotic behaviour practices across an institution (Frese and Gielnik, 2014). According to Goldstein *et al.* (2010), the success of such interactions depends on the support of, and an appropriate balance between, top-down and bottom-up influence.

This is, however, too rare in many organisations whose stakeholders tend to be with opposing views (McMillan, 2008), especially in structures. Besides, many purported leadership experts and all semi-autonomous agents (faculties) seem not to understand the rationale behind what can stimulate the institution's adaptive capability and the transformation process, since they do not understand such complexity paradigms (McMillan, 2008). In this case, positivistic and visionary employees, as referred to by Bledow *et al.* (2013),
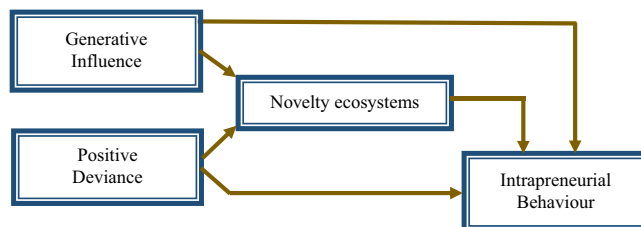

Figure 1.
Intrapreneurial behaviour conceptual framework

acknowledged untapped opportunity of rising funds from private students' enrolment, assessed all other opportunistic ideas gathered and eventually implemented various new sources of funding the university (Bisaso, 2011; Namukasa and Buye, 2009; Mayanja, 2007; Musisi and Muwanga, 2003; Kasozi, 2003 Court, 1999; Ssempebwa, 2011). It is, therefore, implied that through GI, MAK administration managed to take novelty actions.

One of the fundamental opportunities recognised, evaluated and exploited through the opportunity-tension generated was the introduction of a private students' recruitment scheme to raise the required funds for the university basic requirements and infrastructure support. Numerous other explorations and experimentations of unfolding series of events emerged at every level of the university. These happened to foster NE process in the university. As indicated in "The MUBS Co-evolution Journey success story" (p. 1), the policy which was introduced supported both bottom-up and top-down connections and interplay of interactions within the MAK governance system.

PD, NE and IB
Complexity leadership studies examine NE discipline which focusses on interactions between ecosystems, eco-subsystems and their environments (Lindhult and Hazy, 2014; Frese and Gielnik, 2014). These ecosystems are made up of a vast set of complex interchanges and non-linear changes or effects connected to one another's adaptive and interactive system. These are different strands of interactions and intersections that exhibit different transport rates of nutrients, information and wastes (McMillan, 2008). Hence, no subsystem[8] can survive on its own. This means that thinking and acting can occur at many different levels of scale, and since complex systems are inherently non-linear, what happens on microscale may have a large impact on a macro or even collective scale (McMillan, 2008).

Goldstein *et al.* (2010) presented PD as the antecedent of NE (Disch, 2009). They assert that developing a high degree of resonance interaction or symbiosis and not predation or competition requires individuals with different backgrounds and with different sets of experiences and who must connect in a very meaningful way (Hazy and Silberstang, 2009). This is lacking in organisations with individuals who happen to posses opposing viewpoints. In most cases, the presence of PD among organisations' employees is fostered and demonstrated when individuals are able to voice their opposing viewpoints in a meaningful manner (Goldstein *et al.*, 2010, p. 39).

In this case, heterogeneity, the vast diversity of components, agents, and parts involved in an ongoing variety of distinct interactions with others, is one of the important features of complex leadership system (Frese and Gielnik, 2014). These different features create novelty since two identical things cannot create something new. This is true for organisation and the presence of the type of leadership that can operate and coordinate different individuals with different background and information. This in turn allows NE to emerge (Goldstein *et al.*, 2010).

The motivation for the study is to address unanswered questions: how GI and PD could, in the dynamic environment, predict IB among university employees in Kenya; and to what extent?

Materials and methods
Sample and procedure
The subjects of the study were the core university employees (full time employees)[9] of public and private universities in Kenya. Participants in this study were 244 employees, from five private and five public universities in the Republic of Kenya[10]. A self-administered questionnaire was used to capture the empirical data from the respondents.

Measurement

GI. GI variable was examined to assess the multiplicative interconnections of leaders (Hentschke and Caldwell, 2010) within a university setup and their quality of interaction. These university-designated employees were described as personnel with different backgrounds and with different sets of experiences (Goldstein *et al.*, 2010). The rationale for this was that GI is not delivered from the top leadership alone. It is the outcome of connections and interplay of interactions with mutual influence that occurs to induce exchange of ideas. This variable was measured and assessed by focussing on the magnitude of multiplicative interaction resonance for each university under study (Anderson and West, 1998).

PD. PD was examined by assessing the level of existing tolerance towards individuals who tend to do something different or unplanned, even when it causes doubts with others (Goldstein *et al.*, 2010). The study also examined the behaviour of certain individuals whose uncommon practices enable them to find better solutions to problems than their neighbours, who have access to the same resources (Pascale *et al.*, 2011). Some other items in the instrument were designed to capture the social intervention tools, techniques and special abilities available in the leadership social systems to help identify and amplify novel experiments of positive deviants, and whether such are intended to solve existing problems and/or opportunity-exploitation potential, which were previously unnoticed (Seidman and McCauley, 2008). This study measured PD by examining the quality and quantity of university employees' uncommon practices in addressing prevailing challenges.

Respondents in this study were asked to assess the quality and quantity of certain employees' uncommon practices observed in addressing prevailing challenges and the extent of leadership encouragements for newness, uniqueness and novelties trials or traits of workers as proposed by Hivner *et al.* (2003).

NE. In this study, NE was reflected as a mediating variable. First, a unidimensional analysis was applied to this variable by examining the magnitude of unfolding series of events witnessed and how they get known, get selected, the level of conformity or submission and how they are adopted and reinforced through networks. It was also examined as a process which is not led by any one individual but emerges through unfolding series of events at every level of the organisation. This was done by considering interactions between ecosystems, eco-subsystems and their environments (interacting ecosystems).

In the same manner, respondents were asked to assess the magnitude of unfolding series of events witnessed and how they get known, get selected, the level of conformity or submission, how they are adopted and reinforced through networks.

IB. The predicted or criterion variable IB was examined using its basic virtues or constructs embedded in the opportunity – "TREE" (Haynie *et al.*, 2009; Shane, 2003). Items for this variable were to capture the environmentally generated opportunity tension as an emergence, the intrapreneurial opportunity recognition (Zolin and Kropp, 2010) prompted, opportunity evaluation practice and consequently opportunity exploitation behaviour (opportunity – "TREE") (Shane, 2003).

All variables for the study were tested for validity and reliability as suggested by literature (Sekaran and Bougie, 2010; Blumberg *et al.*, 2011) (Table I).

No.	Variables	CVI	Reliability Cronbach's α	No. of items	Scale
1	Generative influence	0.79	0.926	10	1-6
2	Positive deviance	0.77	0.877	08	1-6
3	Novelty ecosystems	0.71	0.927	06	1-6
4	Intrapreneurial behaviour	0.85	0.956	09	1-6
	Total number of items retained after CFA			33	

Table I.
Retained items
after CFA

Statistical analysis
Four approaches of statistical analysis as used by Mustapha *et al.* (2011) were utilised in this study as follows: first, IBM SPSS statistics version 20 was used to compute the descriptive statistics: the mean, standard deviation, percentages, range, reliability coefficients and zero order correlations (Field, 2005). Descriptive measurements were used to report demographic data and to check the level of all predictor, mediator and criterion variables. Frequency measures including percentage, mean and standard deviation, coefficients and plots were used in this process.

The second analysis was to determine the linear relationship between two quantitative variables and between behavioural characteristics including GI, PD, NE and IB among organisation employees. For this purpose, Pearson's product moment correlation was chosen.

Third, the analysis of moment structures (AMOS) Program version 23, a graphic and statistical analysis tool, was used for Confirmatory factor analysis (CFA) and structural equation modelling (SEM) or path analysis, to examine the goodness of fit of the proposed model, and subsequently to estimate the structural coefficients pertaining to the hypothesised path model. The study used SEM to verify the hypothesised relationships between IB variables, namely, GI, PD, NE and IB among organisation's employees. This technique allowed the estimation of causal relations among variables as well as mediating effects of direct and indirect effects of mediator variables in the relationships between predictor variables and the criterion variable.

The fourth analysis used was the bootstrapping method in order to test the hypothesised relationships. In this case, the Sobel's z-test was conducted to test equation of z-value and to examine whether the mediators carried the effect of the independent variables on the dependent variable.

The participants' representation in the study was 128 (52.5 per cent) male and 116 (47.5 per cent) female. Majority of respondents' age ranged from 18 to 49 years (201-82.4 per cent), while the respondents 50 years and above were 43 (17.6 per cent). Overall, 214 (87.7 per cent) of the study's respondents had more than one year of experience in their current job. This means that the study sample involved the targeted population.

Since the overall missing value attained was 0.188 per cent (Figure 2), the study used an automatically selected multiple imputation method to replace the missing values. IBM SPSS Statistics Version 20 was used to select the most appropriate method for the captured and scanned data (Hair *et al.*, 2010; Wayman, 2003).
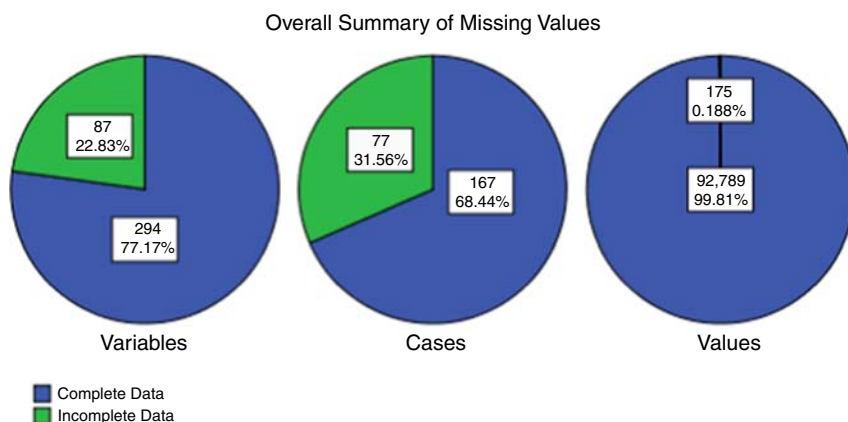

Figure 2.
Missing values
analysis pattern
based on multiple
imputation

CFA. This study used CFA and SEM, as recommended by literature, to determine whether the study indicators strongly loaded on the factors (Hair *et al.*, 2010; Field, 2005; Podsakoff *et al.*, 2003). The items that loaded weakly on the hypothesised factors were removed from the scale based on the results from unidimensional and multidimensional CFA for the good or an acceptable fit of the data to represent the behaviour of the targeted population (Hair *et al.*, 2010; Dunn *et al.*, 1994). According to Hair *et al.* (2010), a factor loading of 0.50 (cut-off point) and above on a factor is considered acceptable and a significant representation of the required population.

The constructs for the four variables in this study, as displayed in the conceptual framework (Figure 1), were examined using SPSS-AMOS 23 in separate CFA variable measurement models. Constructs which satisfied Kline (2005) standard CFA model conditions for the four variables were retained. The study, therefore, used the retained constructs to formulate a 33-item instrument on a six-point scale. The study examined IB criterion variable using four constructs with nine items. NE mediating variable had three constructs with six items, and the predictor variables had 18 items (GI had ten items from four constructs, and PD had eight items from two constructs) (Table I). See the CFA model of the retained items for the goodness of fit. The goodness of fit estimate indices are given in Table II (See Figure 6).

Structural equation model fit, path analysis and mediation effect analysis were the tests carried out in this study.

Results
Testing competing models
Results in Table III, derived from the two competing models (Models 1 and 2), revealed that Model 2, with a mediating variable (see Figure 4), had an enhanced χ^2 ($\chi^2 = 0.665$) above the cut-off point of 0.50 and still above Model 1 χ^2 ($\chi^2 = 0.515$). See Figures 3 (with no mediator) and 4.

It was also observed that all the incremental fit measures (for baseline comparisons), the absolute measures and the parsimony measures returned were all superb in both models (Table III). Besides, the *p*-value for testing the null hypothesis (H_0) of close fit (PCLOSE) in Model 2 was not only above the cut-off point but improved as well from that of Model 1 (PCLOSE increased from 0.867 to 0.947).

This meant that Model 2 with a mediation effect was a superior model to test the study's *H1-H7* (see Table III).

This permitted conducting mediation analysis in order to assess the proposed cause effect on IB directly and indirectly (through a proposed mediator). According to Preacher and Hayes (2004), the utility of mediation analysis stems from its ability to go beyond the merely descriptive to a more functional understanding of the relationships among variables.

The β coefficients returned in Table IV show that the absence of a direct relationship between GI and IB (which was found not significant in Model 2; see Table III) provided Model 3 to be a better fit model with improved χ^2 ($\chi^2 = 0.771$), higher than Model 2 ($\chi^2 = 0.665$).

χ^2/df (CMIN/df)	1.929	Good	Literature
CFI	0.867	Acceptable	Lowry and Gaskin (2014), Hair *et al.* (2010),
GFI	0.823	Acceptable	Kline (2005), Anderson and West (1998)
AGFI	0.769	Acceptable	
RMSEA	0.062	Moderate	

Table II.
CFA model of the retained items for the goodness of fit

Absolute, incremental and GOF indices	Rule of thumb Hair *et al.* (2010)	Model 1 without mediator	Model 2a with a mediator	Model 2b with a full mediator
χ^2				
χ^2	≥0.50	0.515	0.665 improved	0.771 improved
Degree of freedom (df)	≥1.00	2	3 improved	4 improved
Probability value (P)	≥0.05	0.773	0.881 improved	0.942 improved
Absolute measures				
Min discrepancy/D (CMIN/df)	≤3.00	0.258	0.222 improved	0.193 improved
Goodness of fit index (GFI)	> 0.95	0.999	0.999 maintained	0.999 maintained
Root-mean-sq. error of appx (RMSEA)	< 0.08	0.000	0.000 maintained	0.000 maintained
p-value for testing the H_0 of close fit (PCLOSE)	> 0.05	0.867	0.947 improved	0.980 improved
Incremental fit measures (baseline comparisons)				
Incremental fit index (IFI)	> 0.95	1.00	1.00 maintained	1.00 maintained
Tucker-Lewis index (TLI)	> 0.95	1.00	1.00 maintained	1.00 maintained
Comparative fit index (CFI)	> 0.95	1.00	1.00 maintained	1.00 maintained
Parsimony measures				
Normed fit index (NFI)	> 0.95	0.998	0.998 maintained	0.998 maintained
Goodness of fit index (AGFI)	> 0.90	0.995	0.995 maintained	0.995 maintained

Table III.
A comparison of
Model 1, Model 2
and Model 3

Absolute, incremental and GOF Indices
$\chi^2(\chi^2 > 0.50?)$ 0.515
Degree of Freedom (df >1.00?) 2
Probability Value (P >0.05?) 0.773
Absolute Measures
Min Discrepancy/df (CMIN)/df (<3.00?) 0.258
Goodness of fit Index (GFI>0.95?) 0.999
Root Mean Sq. Error of Approxn. (RMSEA<0.08?) 0.000
p-value for testing the HO of close fit (PCLOSE>0.05?) 0.867
Incremental Fit Measures (Baseline Comparisons)
Incremental Fit Index (IFI>0.95?) 1.00
Tucker-Lewis Index (TLI>0.95?) 1.00
Comparative Fit Index (CFI>0.95?) 1.00
Parsimony Measures
Normed Fit Index (NFI>0.95) 0.998
Goodness of fit Index (AGFI>0.90) 0.995

Standardised β Weights Estimates:

			Estimate
Intrapreneurial Behaviour	←	Gender	−0.057ns
Intrapreneurial Behaviour	←	Positive Deviance	0.385***
Intrapreneurial Behaviour	←	Generative Influence	0.226***

Model Predictive Power Estimate
Squared Multiple Correlations:
Estimate
Intrapreneurial Behaviour 0.312

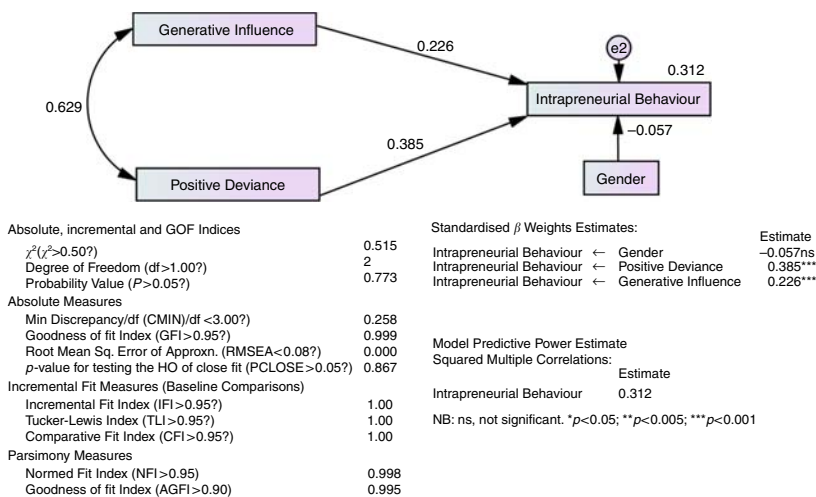NB: ns, not significant. *$p<0.05$; **$p<0.005$; ***$p<0.001$

Figure 3.
Direct effect estimates
for the "a-path" –
structural equation
Model 1

Note: NB: An intrapreneurial behaviour model when the mediation variable was controlled

Consequently, this effect rendered the estimated Model 3 the ideal model to examine IB (see Table III).

The SEM path analysis findings based on Models 2 and 3 revealed in Table IV that four of the study's direct hypotheses (*H1-H4*) were supported. It was only one of these direct hypotheses (*H7*) which was not supported.
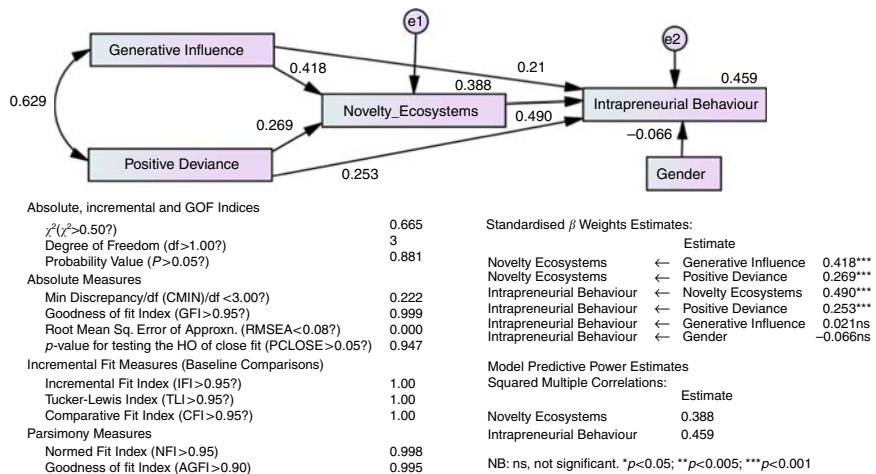
Figure 4.
A mediated
intrapreneurial
behaviour – structural
equation Model 2

Absolute, incremental and GOF Indices

$\chi^2(\chi^2>0.50?)$	0.665
Degree of Freedom (df >1.00?)	3
Probability Value (P >0.05?)	0.881

Absolute Measures

Min Discrepancy/df (CMIN)/df (<3.00?)	0.222
Goodness of fit Index (GFI >0.95?)	0.999
Root Mean Sq. Error of Approxn. (RMSEA<0.08?)	0.000
p-value for testing the HO of close fit (PCLOSE>0.05?)	0.947

Incremental Fit Measures (Baseline Comparisons)

Incremental Fit Index (IFI >0.95?)	1.00
Tucker-Lewis Index (TLI >0.95?)	1.00
Comparative Fit Index (CFI >0.95?)	1.00

Parsimony Measures

Normed Fit Index (NFI >0.95)	0.998
Goodness of fit Index (AGFI >0.90)	0.995

Standardised β Weights Estimates:

			Estimate
Novelty Ecosystems	←	Generative Influence	0.418***
Novelty Ecosystems	←	Positive Deviance	0.269***
Intrapreneurial Behaviour	←	Novelty Ecosystems	0.490***
Intrapreneurial Behaviour	←	Positive Deviance	0.253***
Intrapreneurial Behaviour	←	Generative Influence	0.021ns
Intrapreneurial Behaviour	←	Gender	−0.066ns

Model Predictive Power Estimates
Squared Multiple Correlations:

	Estimate
Novelty Ecosystems	0.388
Intrapreneurial Behaviour	0.459

NB: ns, not significant. *p<0.05; **p<0.005; ***p<0.001

Table IV.
A Comparison of
standardized β
coefficients returned
(Models 1-3)

	Direct effects Model 1 β Coef.	Mediation effects Model 2 β Coef.	Mediation effects Model 3 β Coef.
Direct effect coefficients used to determine a better fit model for the "a-path"			
H7: Intrapreneurial behaviour ← generative influence	0.226***	0.021ns	0.000
H1: Intrapreneurial behaviour ← positive deviance	0.385***	0.253***	0.262***
H2: Novelty ecosystem ← generative influence		0.418***	0.418***
H3: Novelty ecosystem ← positive deviance		0.269***	0.269***
H4: Intrapreneurial behaviour ← novelty ecosystem		0.490***	0.497***
Intrapreneurial behaviour ← gender	−0.057ns	−0.066ns	−0.066ns

Notes: NB. *p < 0.05; **p < 0.005; ***p < 0.001

Study findings and their interpretation
PD and IB

H1. There is significant relationship between positive deviance and intrapreneurial behaviour among employees in Kenya.

The first study hypothesis was supported ($\beta = 0.262$ at $p < 0.001$).

The finding suggests that university leaders who endeavor to encourage their employees to try their own approaches to task completion methods and tend to promote employees' freedom in the use of their ability and/or own judgement, even when they deviate from the norm, are capable of boosting employees' creativity while addressing prevailing challenges, generates more spontaneous ideas, comes up with new venture creations and hence, experiences a history of intrapreneurial success (Table V).

GI and NE

H2. There is significant positive relationship between generative influence and novelty ecosystems in an organisation.

The second hypothesis was supported ($\beta = 0.269$ at $p < 0.001$).

This means that the university employees who endeavour to interact and share their new ideas or mindsets in doing things to address prevailing university challenges

are opportunities to boost tolerance of failure type of governance by the leadership, enjoy the aspect of achieving desired goals, and participate in systems designing to monitor the emerging/evolving multi-level events.

PD and NE

H3. There is a significant positive relationship between positive deviance and novelty ecosystems among organisation employees.

The third hypothesis was also supported ($\beta = 0.418$ at $p < 0.001$).

The finding suggests that university employees who dare to try their own ways of completing tasks and endeavour to make use of their ability and/or own judgement even when they deviate from the norm tend to attract tolerance of failure by the leadership, enjoy the aspect of achieving desired goals and participate in systems designing to monitor the emerging/evolving multi-level events.

NE and IB

H4. There is a significant positive relationship between novelty ecosystems and intrapreneurial behaviour among organisation university employees in Kenya.

The fourth hypothesis was supported ($\beta = 0.497$ at $p < 0.001$).

The finding suggests that universities where leadership applies tolerance of failure, encourages employees to achieve desired goals with a degree of freedom, designs and puts in place systems to monitor the emerging/evolving multi-level events not only nurtures employees' creativity in addressing prevailing challenges but also generates more spontaneous ideas, comes up with new venture creations and hence, experiences a history of intrapreneurial success.

Mediation effect results
According to Lowry and Gaskin (2014), Hair *et al.* (2010), and Kline (2005), the mediation rule of thumb is the following: If the difference between total effect and indirect effect is zero, this will prove the existence of a full mediation (Table IV derived from Model 3 in Figure 5). On the other hand, if the indirect path (b-path) is reduced from the direct path (a-path) but remains significant when a mediation variable is included as an additional predictor, then the partial mediation is supported. If the β estimate values of the "b-path" reduce as compared to the "a-path" values (without a mediation) and are found still significant in the SEM bootstrap analysis, it will then prove the existence of a partial mediation. Guided by these rules of thumb on mediation, values in Table VI revealed that both mediation effect hypotheses (*H5* and *H6*) were supported.

NE mediation effect between GI and IB among organisation employees

H5. Novelty ecosystems mediate relationship between generative influence and intrapreneurial behaviour among organisation employees.

	Stdsd a-path β Coef.	SE	*t*-value	Results *H7, H1-H4* Supported?
H7: Intrapreneurial behaviour←generative influence	0.000	–	–	Not supported
H1: Intrapreneurial behaviour←positive deviance	0.262***	0.055	4.705	Yes supported
H2: Novelty ecosystem←generative influence	0.418***	0.085	6.473	Yes supported
H3: Novelty ecosystem←positive deviance	0.269***	0.073	4.167	Yes supported
H4: Intrapreneurial behaviour←novelty ecosystem	0.497***	0.048	8.930	Yes supported
Notes: NB: ns, not significant. *$p < 0.05$; **$p < 0.005$; ***$p < 0.001$				

Table V.
Summary of direct standardized "a-path" based on Model 3 β coefficients
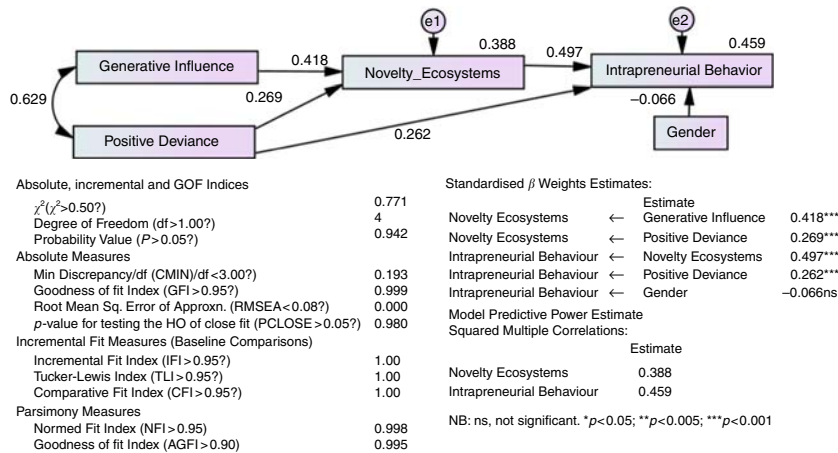
Figure 5.
A final mediated intrapreneurial behaviour – structural equation Model 3

	Gender β Coeff.	Generative influence β Coeff.	Positive deviance β Coeff.	Novelty ecosystem β Coeff.
Standard total effect				
Novelty ecosystem	0.000	0.418**	0.269**	0.000
Intrapreneurial behaviour	0.066ns	0.208**	0.396**	0.497**
Standard direct effect				
Novelty ecosystem	0.000	0.418**	0.269**	0.000
Intrapreneurial behaviour	0.066ns	0.000	0.262**	0.497**
Standard indirect effect				
Novelty ecosystem	0.000	0.000	0.000	0.000
Intrapreneurial behaviour	0.000	0.208**	0.134**	0.000
Mediation results *(supported or not supported)*	*H5* supported		*H6* supported	
Type of mediation	Full mediation		Partial mediation	

Table VI.
Mediation analysis based on total, direct and indirect effects

Notes: NB: ns, not significant. *$p < 0.05$; **$p < 0.005$; ***$p < 0.001$

The fifth hypothesis was supported.

According to the results in Table III, *H5* was represented by a direct or a-path. This, however, was found not significant, and yet, when a mediator was introduced, the b-path β value returned was 0.208** which was significant at p-value < 0.05. Furthermore, the difference between standard total effect ($\beta = 0.208$**) and the indirect b-path ($\beta = 0.208$**) is 0. This, therefore, proved the existence of a full mediation in the relationship between GI and IB among organisation employees.

It suggests that whenever employees interact and share new conception based on the general university mindset and whenever improved means in work methods developed by junior employees are quickly applied in a university setup, it will enable university employees to develop the zeal of learning how to deal with prevailing new challenges creatively. These practices are, according to this study, the antecedents of spontaneous generation of ideas alongside new venture creations (IB).

NE mediation effect between PD and IB

H6. Novelty ecosystems mediates relationship between positive deviance and intrapreneurial behaviour among university employees in Kenya.

The sixth study hypothesis was supported.

Guided by the rule of thumb stated by Lowry and Gaskin (2014), Hair *et al.* (2010), and Kline (2005), Table IV values suggest a partial mediation of NE mediation effect between PD and IB among university employees. It is evident that the β estimate values ($\beta = 0.134^{**}$) of the "b-path", as given in Table IV, reduce from "a-path" values ($\beta = 0.262^{**}$) without a mediator and were still found significant.

This suggests that whenever university employees are encouraged to try their own methods of completing tasks, and given the freedom to make use of their ability and own judgement, even when they deviate from the norm, these same employees' level of new institution virtues or prospects identifications tend to intensify. This, is however, possible either through tolerance of failure by the leadership, promoting employees to achieve desired goals, and through systems designed and put in place to monitor the emerging/evolving multi-level events.

GI and IB

H7. There is a significant relationship between generative influence and intrapreneurial behaviour among organisation employees.

The seventh hypothesis was not supported ($\beta = 0.021$ at $p > 0.001$).

The findings suggest that mutual interactions, which seem to enhance the ability to share generated ideas or mindsets in addressing prevailing university challenges, do not correspond or promote university employees innovativeness in Kenya. This has been, however, noted in this study as discussed earlier that interactions enablement, mutual cooperation and adaptability (GI practices) are significantly associated with employees innovativeness only through encouragements received from the leadership, tolerance of failure measures exercised by leadership, the degree of freedom provided to achieve desired goals, and the availability of systems designed to monitor the emerging/evolving multi-level events (NE mediation). Without which, GI is not significantly associated with IB among university employees in Kenya.

Discussion of the findings

All the supported hypotheses (*H1-H6*) are consistent with literature, except *H7*, which was not supported. The first findings of this study (*H7*) are partly supported by Goldstein *et al.* (2010), McMillan (2008), Uhl-Bien *et al.* (2007) and Lichtenstein *et al.* (2006). These argue that GI is dynamic, and it goes beyond the competencies of individuals alone; it is the product of interaction tension, adaptive tension and restrictive tension such as exchange rules governing changes in perceptions and understanding (Lichtenstein *et al.*, 2006). Complexity leadership theory has it that when agents interact, they may experience tension in the form of pressures and challenges to their personal knowledge base (Lindhult and Hazy, 2014). However, the study finding has it that such tension is significantly associated with opportunity tension and employees innovativeness only through encouragements received from the leadership, tolerance of failure measures exercised by leadership, the degree of freedom provided to achieve desired goals and the availability of systems designed to monitor the emerging/evolving multi-level events (NE mediation). Without which, GI is not significantly associated with IB among university employees. In other words, NE act as a conduit or a vehicle through which GI could intensify IB among university employees.

The study also revealed that PD could help to stimulate IB among university employees both directly and through generated NE. Since the study suggests the NE over again serve as a vehicle through which PD practices could partially intensify new institution virtues or prospects identifications (opportunity identification, evaluation and exploitation), leaders, educators and policy makers should pay attention on NE measures. These include providing employee freedom to try their own ways of doing things and encourage employee to make use of their ability and own judgement even when they deviate from the norm (Goldstein *et al.*, 2010; Hulsheger *et al.*, 2009; McMillan, 2008). Although literature demonstrated the need to facilitate positive deviants, little efforts was put in explaining how PD could stimulate IB among university employees in a dynamic environment.

Furthermore, each of the two theories, namely, entrepreneurship theory and complexity system leadership theory, could not explain IB adequately. The study results, however, proved that integrating the two theories in a single model could better explain and predict IB among university employees. The tested model (Figure 5) renders a better explanation and is able to guide the processes, mechanisms and outcomes of IB within a complexity environment in which Kenyan universities operate. This study proved that the construct of NE fully mediates the relationship between GI and partially mediate PD and intrapreneurship behaviour. This mediation effect has, therefore, proven to have a fundamental avenue through which employees' decision to act intrapreneurially can be enhanced.

Practical and social implications
The examined and verified IB among university employees model can be used to explain, predict and replicate based on university employees interaction enablement, a mutual collaborations among employees and adaptability. It should, however, be noted that a deeper understanding of the power of GI, PD and NE will not be fully realized until researchers devote as much energy and attention to facilitation as has been devoted to conflict.

Conclusion
The study finding shows that opportunity tension, opportunity identification, opportunity evaluation and opportunity exploitation (IB) are the output of interaction enablement, mutual cooperation and adaptability among university employees in Kenya. This is possible only if measures are in place to permit and quickly set up improved means in the university work methods developed by junior employees. It is through such innovative support by the university leadership that employees would develop the zeal of learning how to deal with prevailing new challenges creatively and to stimulate spontaneous new ideas generation. In this case, leadership needs to and should endeavour to gain a deeper understanding of the importance of permitting and quickly setting up improved means in the university work methods developed by junior employees (NE). These are the effective means to nurture IB among university employees.

PD is an aspect which is associated with IB (opportunity tension, opportunity identification, opportunity evaluation and opportunity exploitation). This is when university employees are encouraged to try their own ways of completing tasks even when they deviate from the norm. These should also endeavour to make use of their ability and/or own judgement. With such and where leadership is ready to tolerate failure in case it occurs, the university is destined to achieve desired goals and will enjoy identification of new institution virtues, prospects, improved services and survival/resilience.

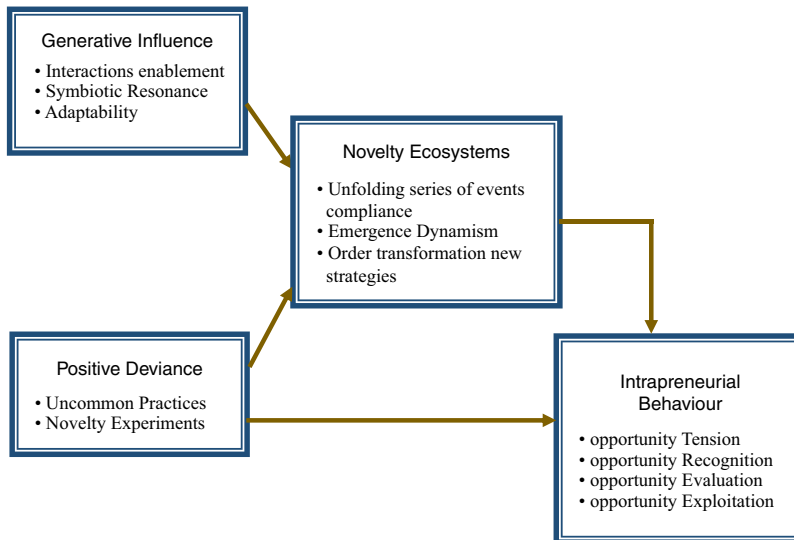Results show that the tested IB model (Figure 6) can demonstrate how to replicate best practices.

Figure 6.
New intrapreneurial
behaviour model

Limitations and suggestions on areas for future research

First, prior research in decision making has shown that respondents are not good at capturing their own behaviour (Neuman, 2007), resulting in potentially inaccurate representations of behaviour tendencies. In this study, subjective appraisals were used, which requires future research to generate and include more objective and triangulation measures.

Second, Neuman (2007) suggested that different cultural contexts affect how people behave intrapreneurially. Previous intrapreneurship studies have shown that there is a relationship between intrapreneurship and culture (Shane, 2003) Caution about generalising the results of this study might be taken especially when comparing it with other regions.

Third, the cross-sectional nature of this study has been critiqued that renders assertions regarding the direction of causality tentative (Naqshbandi, 2016).

Notes

1. Gross underfunding poor remuneration infrastructure messiness and outdated academic programme developments.

2. An ecosystem is a system formed by the interactions of a community of organisms or elements in an organisation.

3. The concept generative influence, in this study, focuses the attention on the nexus of relationships linking individuals with social network, the source of influence and the drive of innovation, and the regulator of change.

4. Positive deviance is the connotation which tends to accept the aspect of doing something different or unplanned even when it causes problems with others. It was noted that major innovations and transformations have in one way or another relied on radical departures from what is expected. Diversity is the source of adaptability.

5. It is a highly complicated structure (like an aircraft) consisting of interconnected parts. In this system, there exists an interdependence phenomena ranging from technological to individual self-organisation in a linear manner (Goldstein *et al.*, 2010).

6. Whereas complexity and not complication means system, components, connections and interactions of different parts in the system through which something new could emerge. For example, complex organisations are different from complicated machinery, i.e., an aircraft. They can adapt and change itself through its internal processes and can actually change to generate better outcomes unlike complicated machinery. With organisation complexity, even a few number of people working together can make a major difference that goes beyond anyone of their capabilities which is not possible with a few components of the machinery. The connections and interactions of different parts effects of this kind with complexity science are non-linear or non-proportional (Goldstein *et al.*, 2010).

7. Novelty ecosystems discipline consists of interactions between ecosystems, eco-subsystems and their environments (a system of interacting ecosystems) study (Lindhult and Hazy, 2014; Frese and Gielnik, 2014).

8. A subsystem is a system that is part of some large system.

9. Employees with leadership and managerial responsibilities within a university setup.

10. Why Kenyan universities? The Kenyan study population was selected using disproportionate stratified purposive sampling from the three nations of similar tertiary education system. Kenya, Ugandan and Tanzanian universities, share same British university education model introduced by the British colonial system under the East African Common Services Organisation (Kakonge, 2016; Inter-University Council for East Africa, 2013a, b). These university constituencies within the East African region were all under the same colonial system and same education system, share similar experiences, use the same official language and are regulated by or under the umbellar of Inter-University Council for East Africa (Kakonge, 2016).

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