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Article

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MANAGEMENT | RESEARCH ARTICLE

Organisational culture and innovation: testing the Schein Model at a private university in Zimbabwe

William Makumbe^{1*} and Yollanda Yeukayi Washaya²

Abstract: Universities are now regarded as strategic actors in the knowledge economy which is mainly anchored on innovation. As organisational culture is considered a key enabler of innovation, university managers must know the specific organisational culture features that can enhance innovation. However, studies that test the relationship between organisational culture and innovation are limited in universities especially in developing countries. This is especially true in Africa, where higher education research barely exists. In light of this, the purpose of this study was to use the multi-layered Schein Model to test the relationship between organisational culture and innovation at a private university in Zimbabwe. The study adopted the survey method and collected data from 250 academics using the SurveyMonkey platform. Data was analysed using the Structural Equation Modelling. Results revealed that values and artifacts were positively related with innovation. Norms had a negative relationship with innovation. The results of this study facilitate the allocation of resources towards specific organisational culture characteristics that can support innovation in African universities.

Subjects: Strategic Management; Management Education; Higher Education Management

Keywords: organisational culture; Schein Model; innovation; Zimbabwe; artifacts

1. Introduction and background

Given the wave of digitalisation and virtualisation that is rapidly altering economies around the world, innovation has become more important than ever before (Cirera & Maloney, 2017). The need

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for innovation has been given further impetus by the world of work that is radically shifting owing to organisation change that is occurring at breath-taking speeds (Deloitte University Press, 2017). In response to the ever-changing external environment, contemporary organisations, including universities, are building conducive organisational cultures (Mcdowell & Anderson, 2019). A conducive organisational culture is important in universities because it facilitates the achievement of their third mission. This third mission of universities involves leading the economic development agenda (see, Compagnucci & Spigarelli, 2020). Universities can effectively lead the economic development agenda through knowledge and technology transfer to the industry and society at large thus facilitating innovation.

As organisation culture is an enabler of innovation in universities (see, Gorzelany et al., 2021; Koko & Makumbe, 2020), this concept is now a priority amongst managers both in the higher education sector and the private sector. In fact, a survey of more than 10,000 managers indicated that they now prioritise organisational culture in business strategy (Deloitte University Press, 2017). Owing to this, studies of organisational culture in universities have burgeoned (see, Akanji et al., 2020; Caliskan & Zhu, 2020; Gaus et al., 2019; Gorzelany et al., 2021; Indiyati, 2018; Al Issa, 2019; Mashile et al., 2021; Masouleh & Allahyari, 2017). However, as observed by authors such as Akanji et al. (2020) these studies largely emanate from the western world. Research findings of organisational culture studies in western universities cannot be applied in Africa because of institutional and culture systems differentials (see, Hofstede, 2011). A paucity of similar studies in the Sub-Saharan context implies that it has become increasingly necessary for organisational culture studies in African countries such as Zimbabwe.

Despite increased attention on organisational culture studies in universities, extant literature does not sufficiently document the explicit characteristics of organisational culture that support innovation in universities (Hogan & Coote, 2014). Prior research does not explicitly document how organisational cultural characteristics such as values, norms and artifacts can lead to desired behaviours such as innovation (Javanmardi Kashan et al., 2021). In light of this, the Schein Model (1992) offers a powerful lens for comprehending the organisational cultural characteristics that permeate a given organisation (Bailey et al., 2019). These characteristics can lead to specific desired behaviours that can influence innovation. For this reason, the central aim of this paper, therefore, was to empirically test the Schein (1992), multilayered organisational culture model, to better understand how the specific organisational culture layers influence innovation in the context of a private Zimbabwean University. Given the growing impetus from Zimbabwean policymakers for local universities to lead economic industrialisation and modernisation, a study on the impact of organisation culture on innovation can assist policymakers to implement appropriate decisions that can enhance innovation.

The rest of the paper is organised as follows: Section 2 briefly explains the literature and theoretical framework underpinning this study; in Section 3—the empirical model and hypotheses are developed; Section 4 describes the methodology used for the collection and analysis of data and the results of such analysis. The findings are discussed in Section 5, followed by implications, and limitations.

2. Literature review

2.1. Organisational culture

Gaus et al. (2019) generally viewed culture as a mental programme that is important in governing people's behaviours, attitudes, and actions in a society. This implies that culture is a useful behavioural control tool in society. It facilitates the alignment of individual behaviours to desired societal expectations. In an organisational context, Akanji et al. (2020) stated that organisational culture consists of deeply rooted artifacts, creations, shared values, and basic assumptions that give unique meaning to organisational membership and guides workplace behaviour. It can thus be reasoned that organisational culture serves as a unifying force of organisational members and

a differentiator from the competition. For this reason, organisational culture is at the core of various organisational activities.

Organizational culture is one of the most debated topics in the corporate arena (Mamatha & Geetanjali, 2020). Resultantly, the concept of organisational culture has been investigated in a wide variety of organisational settings including higher education institutions. Recent studies in universities have analysed the nexus between organisational culture and important variables such as leadership style (see, Akanji et al., 2020); transformational leadership (see, Al Issa, 2019), innovation and knowledge sharing (see, Caliskan & Zhu, 2020; Gorzelany et al., 2021; Koko & Makumbe, 2020), the commitment of faculty members (see, Masouleh & Allahyari, 2017) and turnover intentions (see, Mashile et al., 2021). Organisational culture has been viewed from the theoretical lenses of models such as the Competing Values Framework, the Denison Organisational Model, and the Johnson and Scholes Cultural web. However, this study is premised on the Schein Model of Organisational culture model as it offers specific insights into cultural characteristics that can influence innovation.

2.2. Innovation

There has not been one unanimous definition of the innovation construct. Different schools of thought, depending on their orientation, have come up with different definitions and perceptions of what innovation is. Innovation is often used in conjunction with terms such as creativity, design, invention, and exploitation (O'Sullivan & Dooley, 2009). Gault (2018) defines innovation as the implementation of a new or significantly improved product (either goods or services), process, marketing method, or organisational method in business practices, workplace organisation, or external relations. Other researchers such as Kuratko et al. (2014) view innovation as the process of making changes—large and small, radical and incremental—to products, processes, and services. The common thread shows that innovation occurs around products, services, and organisational practices.

Innovation can be classified in terms of product innovation, process innovation, marketing innovation, and organisational innovation. These different classifications can be incremental, radical, or disruptive innovations. Product innovation is the introduction of a good or a service that is new or significantly improved concerning its characteristics or intended uses (Cirera & Maloney, n.d.). According to Kuratko et al. (2014) product innovation is about making beneficial changes to physical products. Process innovation is the implementation of a new or significantly improved production or delivery method including changes in techniques, equipment, or software (Cirera & Maloney, n.d.). In line with this Kuratko et al. (2014) suggest that process innovation is about making beneficial changes to the processes that produce products or services. Marketing innovation involves the implementation of a new marketing method involving significant changes in some of the marketing mix elements such as product design, packaging, product placement, promotion, or pricing (Cirera & Maloney, n.d.). Organisation innovation is the implementation of new organisational methods in the firms' business practices. It includes structural innovation and procedural innovation (Cirera & Maloney, n.d.). Structural innovation impacts responsibilities, accountability, command lines, and the number of hierarchical levels.

The different types of innovations discussed above can be differentiated according to the trajectory they may take. The trajectory can be radical, incremental, or disruptive. Radical innovation entails introducing changes at a magnitude significant enough to transform the organisation itself by changing the existing market (Kuratko et al., 2014). Radical innovation can destroy or supplant an existing business model. Incremental innovation is the systematic evolution of a product or service into newer or larger markets (Kuratko et al., 2014). Examples include typical improvements and advances in current products and services. The structure, marketing, financing, and formal systems of a corporation can assist in implementing incremental innovation. Disruptive innovation occurs in a situation where established competitors are displaced by technological applications initially introduced at the bottom of the market but then relentlessly move upmarket.

Disruptive innovation often occurs because new sciences and technologies are introduced or applied to a new market that offers the potential to exceed the existing limits of technology (Kuratko et al., 2014). Disruptive technology goes beyond radical innovation and transforms business practice to re-write the rules of an industry. In other words, the business practice of an entire industrial sector could be changed radically. All these innovations are influenced and enhanced by the culture of an organisation (see, Allameh et al., 2011; Bomm et al., 2022; Gorzelany et al., 2021; Javanmardi Kashan et al., 2021; Puryantini et al., 2018)

3. Theoretical underpinning

3.1. Schein Model of organisational culture

This study is premised on the Schein Model of Organisational culture. Schein argued that the main problems of the modern organisation emanate from the lack of distinction amongst the different levels in which organisation culture manifests itself (Morente et al., 2018). Hence, Schein (2004) identified three levels of organisational culture namely the artifacts & creations, values & beliefs, and basic assumptions. These levels are shown in Figure 1 below:

3.2. Level 1: artefacts

These are the visible elements that are at the surface of the organisation and include all the phenomena that one sees, hears and feels when one encounters a new group with an unfamiliar culture (Schein, 2004). These visible cultural products of an organisation include spatial distribution, language, technology, style, clothing, and expressions (Morente et al., 2018).

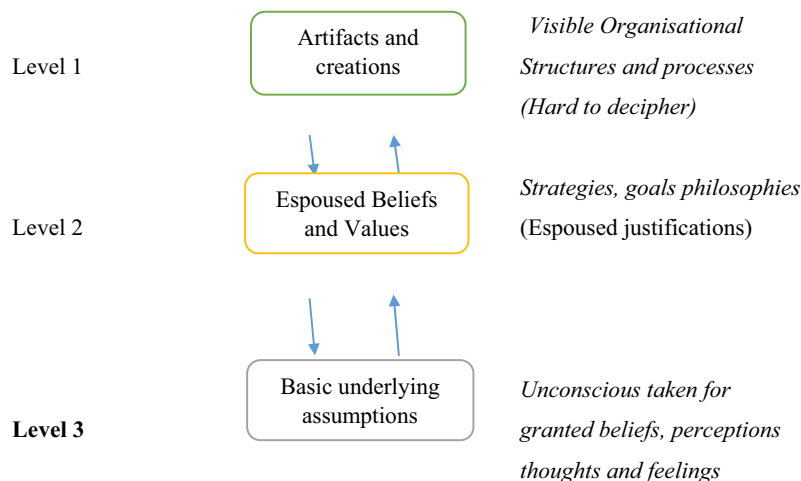
3.3. Level 2: espoused values and beliefs

Values are inner feelings that are rarely discussable and observable but are manifested in the behavioural patterns of organisational members (Hofstede, 2011). Values define what is important in the organisation and what deserves members' attention (Cummings & Worley, 2009). A value is confirmed only by the shared experience of a group and if it is embodied, shared, and used daily in an organisation it becomes an assumption (Morente et al., 2018). Cultural elements included in these levels are cognitive processes, commitments, consensuses, ethics, ideologies, strategies, knowledge, and visions (Morente et al., 2018)

3.4. Level 3: basic underlying assumptions

Basic assumptions are the taken-for-granted beliefs that determine how group members perceive, think, and feel about aspects (Mullins, 2010). Basic assumptions develop as a result of particular solutions that are repeatedly applied until it becomes an established way of doing things. As basic

Figure 1. Schein model of organisational culture.



assumptions imply basic beliefs about aspects it is generally non-confrontable and non-debatable and extremely difficult to change (Schein, 2004).

3.5. Hypotheses development

This section discusses how values, norms and artifacts (as per the Schein Model) are related to innovation.

3.6. Norms and innovation

Shared norms can result in individuals accepting certain behaviours as part of how the organisation operates. These behaviours can include creativity and innovation. When norms that encourage innovation exist in an organisation there is a likelihood that innovation can be enhanced in the organisation. Prior research suggests norms associated with enhancing creativity such as expectations and encouragement of risk-taking, the promotion, and implementation of projects, and coordination and information exchange, are significantly related to innovation (O'Reilly et al., 1991). Researchers such as Taggar and Ellis (2007) confirmed that norms for collaborative problem-solving may result in innovative behaviours. A study of principles of law firms in Australia, Hogan and Coote (2014) confirmed a positive relationship between norms and innovation. It can therefore be proposed that:

H1: Norms are positively related with innovation.

3.7. Values and innovation

Organisational values determine the firms' strategic orientation Hock et al. (2016). Values exist to guide specific behaviours within an organisation. They can act as a signpost of what is considered critical in an organisation and hence can be used to influence innovative behaviours. Organisations that value an innovation culture are expected to learn continuously and develop knowledge to detect and fill gaps between what the market desires and what the firm currently offers (Javanmardi Kashan et al., 2021). Past research has identified values that are associated with an innovation culture as learning development, participative decision-making, collaborative problem-solving, openness and flexibility, internal communication, cooperation, responsibility, appreciation, and risk-taking (see, Javanmardi Kashan et al., 2021). Authors such as Homburg and Pflesser (2000) and Hogan and Coote (2014) also confirmed that values have a bearing on innovative behaviours. In light of this, the following hypothesis can therefore be proposed:

H2: Values are positively related with innovation.

3.8. Artefacts and innovation

As indicated before relevant organizational artefacts can include language and symbols, rituals, and the physical environment and layout of the organisation. This, in part, implies that as argued by Hajar Mohd Roffeei et al. (2018) the availability of infrastructure is important for innovation. Furthermore, according to Hogan and Coote (2014) managers through the use of appropriate language when sending messages, can influence how employees act and behave. This is important when the thrust of the organisation is about focusing on innovative behaviours. On the other hand, the physical layout of organizations can affect valued and expected behaviours. In a study by Toker and Gray (2008) it was established that differences in spatial layout of organizations affected face-to-face consultations and hence innovation. In this study open shared offices enhanced innovation. Why? This is because the non-existence of boundaries improved knowledge sharing which is a critical variable in innovation. The spaces created by office design can facilitate or act as an impediment to social interaction between groups thus affecting knowledge sharing. Rituals are also important in the innovation process. If rewarding innovation is part of the rituals of an organisation, this can motivate other employees to be innovative thus impacting positively

innovative behaviours. (Barnes et al., 2006) argued that if rewards are associated with certain behaviours in an organisation this can lead to other members of the organisation exhibiting the same behaviour. Hajar Mohd Roffeei et al. (2018) the climate for innovation which includes rewards, peer support, and recognition as part of the rituals had a positive relationship with innovation. Other researchers such as Hogan and Coote (2014) confirmed a positive relationship between artifacts and innovation. It can therefore be proposed that:

H3: artifacts are positively related with innovation

In line with the discussion above, this study sought to test the relationships in the conceptual framework shown below;

4. Research methods

4.1. Research context

This study was carried out at a private university in Zimbabwe. The university has several faculties whose central focus is on continuous innovation in university processes. As part of the innovation strategy, the university has a stand-alone innovation hub whose mandate is to turn research ideas into marketable products. This requires a conducive organisational culture that facilitates innovation.

5. Survey instrument

We used a structured questionnaire with a five-point Likert scale to measure organisational culture variables and the innovation construct. Values, Norms, and Artefacts were measured using items adapted from scales developed by Hogan and Coote (2014). The innovation construct was measured using a scale developed by Dobni (2008).

5.1. Data collection

We conveniently sampled 300 academics from our data collection drive. The SurveyMonkey platform was used to broadcast the questionnaire using email addresses we obtained from the university database. From the targeted participants, 250 people responded thus yielding a response rate of 83.3%.

6. Data analysis

6.1. Demographic profile of respondents

The demographic profile of the respondents is tabulated below:

6.2. Reliability and validity

Reliability and Validity of the data were assessed using the common method bias, Indicator reliability, Cronbach's alpha, Average Variance Extracted (AVE), and Composite Reliability (CR) as described below.

6.3. Common method bias

Harman's one-factor test was done to detect the common method bias in the measurement instrument. The results are shown in Table 1 and 2 below. The total variance extracted was 34.83% which was below the threshold value of 50%. This indicated the absence of bias in the measurement instrument.

6.4. Indicator reliability

According to Hulland (1999), reflective indicator loadings of >0.5 show that the item is a good measurement of a latent construct. As shown in Table 3 below, all the indicator loadings were

Table 1. Demographic profile of respondents (N = 250)

Variable	Frequency	Percentage
Gender		
Male	133	53%
Female	117	47%
Age		
18–25	35	14%
26–35	47	19%
36+	168	67%
Education		
National Diploma	7	3%
Bachelor's Degree	65	26%
Master's Degree	113	45%
PhD	65	26%

Table 2. Total variance explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.224	34.830	34.830	5.224	34.830	34.830
2	1.976	13.174	48.004			
3	1.252	8.344	56.348			
4	1.007	6.713	63.061			
5	.938	6.255	69.316			
6	.876	5.842	75.158			
7	.743	4.953	80.111			
8	.639	4.258	84.369			
9	.534	3.559	87.928			
10	.410	2.731	90.659			
11	.369	2.459	93.118			
12	.297	1.978	95.097			
13	.285	1.903	96.999			
14	.271	1.804	98.804			
15	.179	1.196	100.000			

Extraction Method: Principal Component Analysis

greater than 0.5 except for V1 (with an indicator loading of 0.30). This indicator (V1) was removed from the Structural Equation Modelling analysis to improve the model fit indices.

6.5. Convergent reliability

Convergent reliability is the extent to which a measure correlates positively with alternative measures of the same construct (Hair et al., 2012). Convergent reliability is assessed using the AVE. The AVE should be greater than 0.5 (see Bagozzi, 1986; Hair et al., 2012). The AVE for all the constructs in this study was greater than 0.5 (see, Table 3 below) thus the measurement scales showed good convergent reliability.

Table 3. Means, standard deviation, factor loadings, and reliability values (Cronbach Alpha, average variance extracted & composite reliability)						
Construct	Measurement Items	Factor Loading	Mean	Standard Deviation	Alpha	AVE
Norms						
N1	At this university, we are encouraged to be the most creative and innovative institution in the country	0.55	4.808	1.093	0.76	0.51
N2	Employees at this university are expected to be open to new ideas and be responsive to them	0.62	4.641	1.289		
N3	Open communication of new ideas and practices is expected to be second to nature at this university	0.75	4.615	1.281		
N4	Employees at this university are encouraged to work together as teams throughout the institution to develop new ideas & practices	0.72	4.628	1.310		
Values						
V1	This university aspires to be the best in the country.	0.30	4.132	1.671	0.83	0.63
						0.84

(Continued)

Table 3. (Continued)

Construct	Measurement Items	Factor Loading	Mean	Standard Deviation	Alpha	AVE	CR
V2	Great value is placed on recognising and rewarding employees' accomplishments at this university.	0.78	4.141	1.560			
V3	This institution values a willingness to experiment with new ideas.	0.83	4.359	1.329			
V4	This university places great value on being flexible in our approach to problems	0.77	4.205	1.582			
Artifacts					0.84	0.58	0.87
A1	There are well-known stories in this institution about employees who have developed new and useful ideas.	0.79	4.179	1.575			
A2	There is an effort within this institution to acknowledge and reward the implementation of new services and ways of doing things	0.82	4.231	1.413			

(Continued)

Table 3. (Continued)

Construct	Measurement Items	Factor Loading	Mean	Standard Deviation	Alpha	AVE	CR
A3	There are meeting rooms and discussion rooms at this university where employees can meet and discuss ideas and ways to implement them.	0.72	4.692	1.370			
A4	This university celebrates the adoption of new practices and processes	0.72	4.487	1.375			
Innovation					0.90	0.71	0.72
I1	Policies and processes at this university foster innovation	0.88	4.436	1.420			
I2	Innovations are an underlying culture at this university	0.86	4.295	1.415			
I3	This university has metrics for measuring innovation	0.79	4.090	1.564			
I4	Managers at this university help to break down innovation barriers	0.83	4.269	1.543			

Table 4. Structural model fit indices summary

Model Fit Index	Actual Score	Recommended Value
CMIN/df	1.647	≤ 3
CFI	0.932	$\leq .90$
RMSEA	0.072	≤ 0.08
IFI	0.935	≤ 0.90

6.6. Internal consistency reliability

Internal consistency reliability can be assessed using composite reliability (CR) and Cronbach's alpha (α). According to Gefen, Straub, and Boudreau (2000), a CR value greater than 0.7 indicates adequate internal consistency reliability. Hair et al., 2017 suggested that Cronbach alpha (α) values between 0.60 and 0.70 are widely considered desirable in research to indicate internal consistency reliability. As shown in Table 3 below all the constructs satisfied the threshold values for the Cronbach alpha and Composite Reliability.

6.7. Confirmatory factor analysis

The suitability of data for factor analysis was assessed using the Kaiser-Meyer Olkin and Bartlett's Test of Sphericity. The KMO value was 0.912 which was above the minimum recommended value of 0.5 (see Hair et al, 2006) and the Bartlett's of Sphericity was significant at $p = .000$, rendering the sample adequate to run factor analysis. Figure 3 below shows the results of the confirmatory factor analysis as well as Figure 2 shows the research network.

In assessing the model the researchers used the following model fit indices: CMIN, IFI, CFI, and the RMSEA. After running the confirmatory factor analysis for the model, the results indicated that the model was good because it produced results that were within acceptable limits (see Hair et al, 2012). The model fit indices that were obtained from the confirmatory factor analysis are as follows: CMIN = 1.676; $p = .000$; IFI = 0.919; CFI = 0.96; RMSEA = 0.094.

6.8. Structural Equation Modelling

Structural Equation Modelling was employed to examine the path relationships in the model. The relationships amongst Norms, Values, Artefacts, and Innovation were estimated. Variable V1 (as shown on the CFA) was removed from the SEM analysis because the factor loading was below 0.50. The structural equation model diagram, model fit indices and path analysis results are shown in Figure 4 and Tables 4 & 5 respectively below.

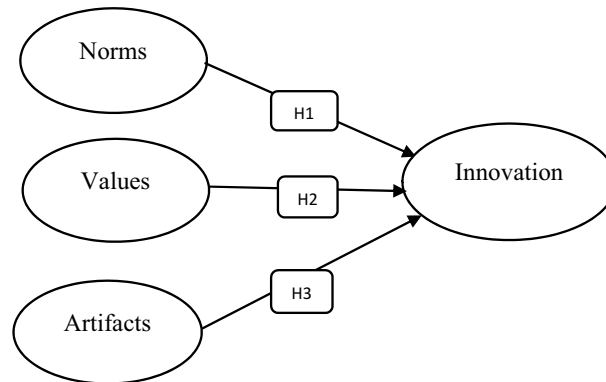
7. Discussion

Innovation is an enabler of socioeconomic development. Innovation outputs such as new products, new start-ups, new marketing methods, and administration efficiencies enhance economic growth. Universities have been identified as key pillars in creating these innovation outputs. This is because universities facilitate innovative behaviours such as the generation and dissemination of new knowledge which is invaluable in the innovation equation. A conducive organisational culture

Table 5. Path analysis results

Path	Path coefficient	T-Value	P- Value	Decision
Norms>>>Innovation	-0.29	0.014	0.35	Rejected
Values>>>Innovation	0.81	3.155	0.00	Accepted
Artefacts>>Innovation	0.09	5.146	0.00	Accepted

Figure 2. Research framework.



fosters innovative behaviours in universities. In line with this, we applied the Schein Model to investigate the effect of organisational culture on innovation at a private university. The Schein Model offers deep insights into how different layers of organisational culture can facilitate innovation.

The findings of this investigation were centred on three key issues. First. This study established that norms were negatively related to innovation ($\beta = -0.29$, $p = 0.35$). This is rather surprising given that previous research has established a positive association between organisational culture norms and innovation. The current findings are a clear departure from prior studies (see, Hogan &

Figure 3. Confirmatory factor analysis.

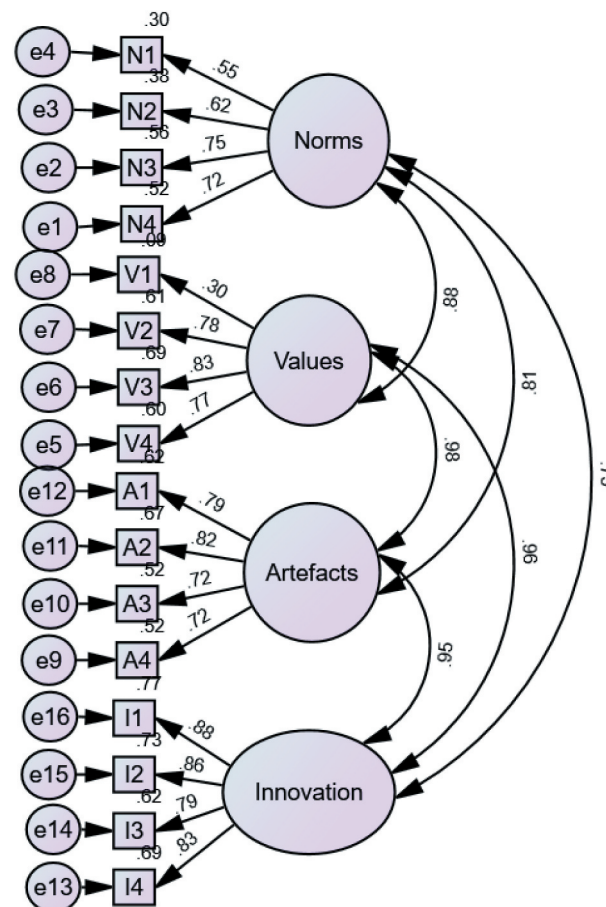
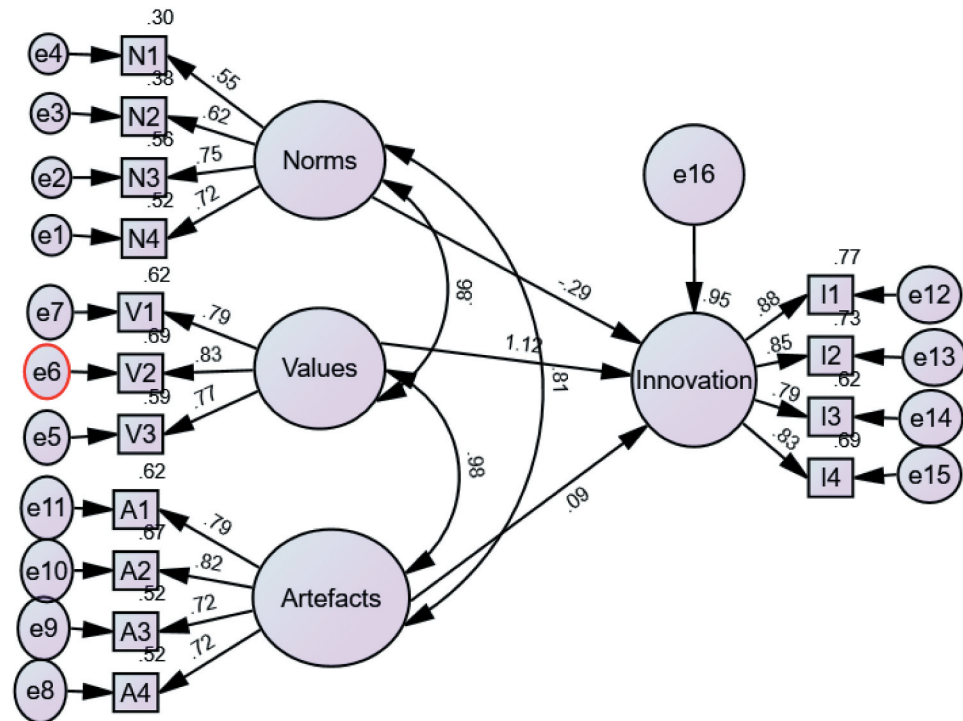


Figure 4. Structural equation modelling.



Coote, 2014; O'Reilly et al., 1991). The current study results point to the fact that norms if taken in isolation, may not be sufficient to enhance innovation. A combination of norms and other organisational culture characteristics can enhance innovation.

Second. As hypothesised, values were found to be positively associated with innovation ($\beta = 0.81$, $p = 0.00$). Values have the greatest impact on innovation. These findings are consistent with the literature (see, Hogan & Coote, 2014; Homburg & Pflesser, 2000). Values are guiding principles that are considered important in an organisation. The findings indicate the importance of specific innovation values such as creativity, risk-taking, and experimentation in a university environment. If these values are widely shared in a university environment there is a likelihood of enhanced innovation.

Third. As hypothesised artifacts were found to be positively related to innovation ($\beta = 0.09$, $p = 0.00$). Although the results are consistent with past research (see, Toker & Gray, 2008), Barnes et al., 2006; Hogan & Coote, 2014), the relationship in the current study was weak. The current findings imply that heavy investments in innovation artifacts have a positive bearing on the level of innovation.

7.1. Theoretical implications

This study has important theoretical implications in the field of organisational behaviour. First, previous studies have examined the influence of organisational culture on innovation in other contexts, especially in developed countries. Little is known about the impact of organisational culture on innovation in developing countries, especially in the African higher education sector. As prior research in higher education is mostly confined to the global north this study presents a significant contribution to higher education research in Africa.

Second, the findings of this study validate the importance of key features of organisational culture (e.g., norms, values, and artifacts) as drivers of specific desired organisational behaviours such as innovation. From the research results, values had the greatest impact on innovation. This

key finding offers insight into the relative importance of the three layers of the Schein Model of organisational culture. The results of this research, therefore, further strengthen the importance of the Schein Model in the field of organisational behaviour.

Third, this investigation revealed that research results vary across contexts. Whereas organisational culture norms were positively associated with innovative behaviors in other regions (see, Hogan & Coote, 2014), the same could not be said in our investigation. This implies that research results are influenced by contextual factors.

7.2. Managerial implications

As universities are a key component of the Triple Helix Model (see, Cai & Etzkowitz, 2020), they play a key role in economic development. Innovations that sprout out of universities have ripple effects on the economy. Technological innovations from university science parks and innovation hubs benefit the general economy through the formation of start-ups, spin-offs, and product and service innovations. This can help fight unemployment, disease, and hunger. Hence universities occupy a central role in socioeconomic development. For this reason, higher education research especially in universities is now more important than ever. This investigation underscores the importance of organisational culture in universities. Innovative behaviours at universities benefit the specific institutions together with the society at large. The results of this study offer key insights into the characteristics of organisational culture that are key in promoting innovative behaviours at universities.

The results confirmed that values and artefacts can enhance innovation. This implies that universities must have shared values that promote innovative behaviours. University managers must develop innovation-guiding principles that provide purpose and direction to organisational members. This will facilitate a change in the mindset of the people within universities to think and act innovatively. For example, innovation must be part of the vision and mission of the university. This solidifies innovation as an important value at a university. Incorporating innovation as part of the vision and mission statement of the university, communicates the importance attached to innovative behaviours in the university community. Furthermore, as part of supporting the vision and mission of the university, strategy documents must include innovation deliverables. Everyone concerned will work towards the attainment of set deliverables. In a university environment, values that can support innovation include entrepreneurship, teamwork, experimentation, risk-taking, creativity, knowledge sharing, and trust. These need to be inculcated and shared extensively within universities to enhance innovation.

Second, artifacts were found to be positively associated with innovation. Artifacts for innovation in a university environment can include physical layouts, buildings for innovation, Information technology equipment, procedure manuals, and teaching materials. The current research results imply that all these are critical in the innovation equation. Therefore, Zimbabwean university managers should prioritise resource allocation towards the development of physical infrastructures such as innovation hubs, meeting rooms, science parks, and technology transfer offices. Teaching for innovation must be adequately supported by management for universities to realise the innovation potential. In this regard, resources such as laboratory equipment and teaching aids have to be availed to create a congenial environment for innovation. Strategy-making in universities should ensure adequate plans are crafted for the development of artifacts for innovation.

7.3. Limitations

The major limitation of this study is that the study was carried out at a single private university. However, we believe that these results offer important insights into how organisational culture characteristics can enhance innovation in a university environment.

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Data availability statement

Data sets analysed during the current study are available from the corresponding author upon reasonable request.

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