

MANAGERIAL-LEADERSHIP COMPETENCIES FOR ENHANCING THE INTEGRATION OF INNOVATIVE TEACHING-LEARNING TECHNOLOGIES

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ABSTRACT

The integration of teaching and learning technologies has been crucial catalysts for undergoing teaching and learning innovations. However, in many higher education institutions, these integration potentials have neither been consistently nor systematically used. The implementation of innovative teaching-learning technological change in higher education remains a significant challenge. Previous studies suggest that universities need to embrace the role of academic leaders for its effective implementation. We used 74 Mid-Level Academic Leaders (MLALs) from selected universities to show how MLALs attributes influence the managerial-leadership competencies for enhancing the influence the integration of Innovative Teaching-Learning Technological change (ITLTs). Our results suggest that MLALs have a relatively low competency level for motivating the adoption and execution of ITLTs change. Seemingly, the overall competency level for managing the integration of ITLTs change found to be relatively low. Furthermore, the results suggest that age, leader experience, leadership position and prior knowledge are essential factors influencing the managerial competency level for leading ITLTs change among mid-level academic leaders. Thus, this study recommends integrating ITLTs in higher to consider leaders' experience throughout the process.

KEYWORDS

Innovative Teaching-Learning Technologies, Managerial Competency, Academic Leaders, Higher Education

1. INTRODUCTION

Managing the execution of change is an essential task for improving the speed and intensification of the change in the organisation. (Bates,2000; Ghavifekr, Afshari& Salleh, 2012). In higher education, the fueled technological change in the education process is essential for universities to remain vital, relevant, dynamic and focused (Harshman & Phillips, 1995; Frost & Chopp, 2004; Tushman & Anderson, 2004; Ensminger et al, 2004, Gelaidan,2018). Despite the teaching-learning technological change in higher education for quite more than a decade, its implementation is either inconsistent or relatively low. (Bernad et al 2014; Zhu, 2015; Machumu et al,2018; Landa, Zhu & Sesabo, 2020). Scholars in change management provide over 50% of major changes implemented in various organisations worldwide fail, higher education in particular. Studies also show the relatively low implementation of e-learning technological change within higher education in Tanzania. Notwithstanding, to enhance the adoption of teaching-learning technological change, Bates (2012) suggest that universities need to embrace the role of academic leaders for its effective implementation. Sharma & Rai (2003) and Fullan (2011) argued that effective implementation of innovative technologies depends on leaders' initiatives. This further demands leadership abilities to meet technological transformations demand in higher education (Garrison & Kanuka, 2004). Besides, previous studies (Aitken &, 2014; Coetzee et al., 2013; Smit & Carstens, 2003) have pinpointed that leadership-change execution competencies assist in the smooth progress of any organisation towards a desired future state, whilst others have argued on its role in overcoming limitations during the change process. Though it has been noted that facing new changes, its implementation remains a critical challenge of leadership. Many of the change implementation failures relate to how leaders enforce it (Ashkenas,2013; Ghafikier, 2012). The available empirical literature relies on diverse leadership-strategic leverage for change implementation towards innovative teaching-learning technologies (ITLTs): For stance through exploring leadership roles (Betz,2003; Afshari et al., 2012, Ozcan,2017;

Zhu & Zayim, 2019), leadership styles (Schepers, Wetzels, de Recyter, 2005), leadership characteristics (Sharma & Rai, 2002) and others on managing the design of the new change (Tushman, 2007). Nonetheless, most of such studies have primarily neglected the exploration of leader-change execution competencies employed by meso level leaders to integrate Innovative Teaching and Learning Technologies (ITLTs) in higher education. Ensminger, (2004) provided that managing execution of change is relegated to middle-level managers.

In this study, we focus on examining Mid-Level Academic Leaders (MLALs)' managerial competencies for enhancing the integration of innovative teaching and learning technologies in the selected universities in Tanzania.

Objective

Assessing managerial competencies among mid-level academic leaders for enhancing the integration of innovative teaching-learning technologies in the selected Tanzanian universities.

Research Questions

1. What are the managerial competencies related to motivating the change, managing the transition, communicating the change and sustaining momentum for enhancing the integration of innovative teaching-learning technologies among mid-level academic leaders in the selected Tanzanian universities?
2. To what extent do the current levels of (perceived) managerial competencies are different to the required (desired) levels of managerial- competencies among mid-level academic leaders in the selected Tanzanian universities?
3. How do leadership attributes among mid-level academic leaders associate with the managerial competencies for enhancing the integration of innovative teaching -learning technologies in the selected Tanzanian universities?

2. LITERATURE REVIEW

2.1 Leadership Competencies and the Integration of ITLTs

From an organisation perspective, leadership is an essential attribute for driving change to achieve strategic goals (Garrison, 2007). Scholars (Harigopal, 2006; Tushman & Anderson, 2004; Harshman & Phillips, 1995) emphasise the need for leadership, which is about facilitating the process of change and questioning the existing implementation practices. According to Garrison (2007), proper execution of any sector changes evolves on securing great leadership. When the organisation is coping /executing with new realities, it must look at what it stands for, the values being challenged and the new attitude, behaviours and competencies required to respond to new change needs.

Leaders in the educational context are known as academic leaders. According to Jing & Yao (2019), academic leaders are the personnel with formal managerial responsibilities who exhibit leadership in academic activities. They prevail as change agents who provide crucial insights that ultimately enhance instructors' motivation and capacitate the shift in teaching-learning practices with related change (Bisbee, 2007). Higher education contends on the effective-appropriate use of innovative teaching-learning technologies to meet the current demand of education. However, like in many other developing countries worldwide, higher institutions, Tanzania, in particular, are lagging behind in the execution of teaching and learning technological change as an alternative means of delivering education (Mwakyusa & Mwalyagile, 2016); Though the fact that some universities had adopted blended or online learning (Sharpe, 2006; Almasi, 2019).

Responding to those technological change challenges, academic leaders need relevant change management-execution competencies for enhancing the integration of innovative teaching-learning technologies. The competencies mainly employed by mid-level leaders provide diverse support towards implementing an inevitable change. The literature emphasises that every academic leader needs a couple of competencies to ensure the proper implementation of ITLTs. Likewise, there is a high demand for such academic leadership in higher learning institutions (HEIs) to set itself on a course of purposeful and sustained change (Les Bell & Middlewood, 2014; Khoshouei et al., 2013). Fullan (2009) argued that leader competency is critical to facilitate the moving stage. The employees will get into the move when leaders are well organised and facilitate their implementation support. The past studies by Baldrige & Burnham (1975) and Beatty

& Lee (1992) indicated that the role of individuals taking leadership might influence an institution's innovative behaviour.

However, the review of Bates (2012) of related literature shows that various studies have examined change execution competencies in various fields. These studies are limited to managerial competencies to execute innovative teaching and learning technologies employed by mid-level academic leaders in higher learning institutions. A study by Ashkenas (2013) and Lakshminarayanan (2016) noted that middle-level leaders lack essential managerial capabilities for managing innovative change.

2.2 Managerial Competencies for the Integration of ITLTs

Change execution competencies mean initiatives' ability for influencing the change. According to (Ashkenas 2013), leader competencies seize the opportunity to strengthen the ability to manage change. Competency allows leaders to spot indicators that lead to performance deficiency whilst speed up and aesthete the teaching-learning delivery in universities (Zhu & Kurtay,2018; Gelaidan,2018; Alshgeri, 2016).

Early studies (Miller & Snow,1978; Beatty & Lee,1992) identify basic leadership strategic-competencies related to general technological change adoption. Their emphasis based on prospectors, analyser, reactor and defender, though some scholars argued that their competencies could only be accomplished by superficial changes in the organisation. Nadler & Tushman (2006) identified three critical managerial competencies involving shaping political dynamics, motivating constructive behaviour and managing transition. Numerous scholars determine the replication of these competencies in a different context. For example, Sharpe, Benfield & Francis (2006) insist on obtaining the appropriate levels of participation in implementing change and using rewards system as necessary strategies for teacher-leader to enhance implementation of teaching-learning technological change. Based on the previous studies, literature suggests that managerial competency relating to technical- generic dimensions are vital in exerting influence in the implementation of organisation technological innovations (Wickramasinghe & Zoyza, 2008; Balyer & Ozcan, 2017).

Table 1. Managerial Competencies for Managing the technological innovations

Competencies	Literature	Findings
Ability to communicate the change	Tushman, (1997); Bordia etal,2004;	Provide direction for management of transition for reducing ambiguity
Ability to obtain feedback about the transition state: manage transition.	Tushman (1997)	Determine the progress of the transition, reduce dependence on traditional feedback processes.
Ability to reward desired behaviour in transition to future state	Tushman, (1997); Haas, (2016)	Use rewards system to shape behaviour to support the future state. Encourage the heart
Ability to obtain the appropriate levels of participation in planning/implementing change.	Tushman, (1997); Bordia etal, (2004);	Create opportunities for participation to obtain the benefits of participation such as motivation, better decision, reduce ambiguity, conflict and enhance better control.
Ability to demonstrate leadership support of the change	Tushman, (1997); Afshari <i>etal</i> (2012); Ghavifekr, Afshari & Salleh (2012)	Shape the power distribution and influence the patterns of behaviour through providing support/resources -remove roadblocks and maintain momentum.

3. METHODS

3.1 Research Design

A cross-sectional mixed research design was employed in this study, whereby the data was collected once at a time sequentially. Both qualitative and quantitative methods rely on the need for triangulation and seek elaboration for overcoming the weakness of one method on the other.

3.2 Participants

A total of 74 out of 150 mid-level academic leaders, including principals, deans, directors, Heads of Departments (HoDs) and Coordinators of the University of Dodoma and Mzumbe University in Tanzania, were involved. The participants were randomly selected, whereas the survey questionnaires were distributed using the drop & pick method and a shared link for the web survey. From 74 respondents, 7 participants were interviewed to get their deep insights on their competencies in managing the execution of change related to the integration of ITLTs.

Table 2. Demographic information of the participants

Variable	Categories	Measurement-variables	M	F	%	
Gender	F	1=male; 0=female		25	33.3	
	M			50	66.6	
Academic position	Assistant lecturer	1=old career; 0=early career		19	23.7	
	Lecturer			34	50.8	
	Senior lecturer			15	16.9	
	Associate Professor			6	8.5	
Age		Years	42			
Academic leadership experience		Years of experience	5			
Leadership position	Principal	1=managerial leaders		4	6.8	
		0=supervisory leaders				
	Dean/Director		9	15.3		
	HoDs		25	25.4		
Prior knowledge	Coordinators			36	52.4	
	Yes	1=Training, 0=No training				
			Training		25	35.6
			Self-learning		35	42.5
			Colleagues		6	8.5
No						

M=Mean; F=Frequency %=Percentage

3.3 Data Analysis

This study analysed quantitative data using SPSS version 26, involving both descriptive and inferential analysis. Firstly, one-way ANOVA was performed to check the significance of the means score among the managerial competencies employed. In contrast, post hoc analysis was conducted using Duncan multiple range test to check the means separation. Secondly, the influence of age, gender, academic leadership experience and managerial competencies were analysed using multiple-linear regression analysis.

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \dots + \beta_9X_9 + \varepsilon$$

Where

Y= integration of ITLTs total score

β_0 =Constant; β_1 to β_9 =Coefficient of Xs, X1- X9=Independent variables (age, gender, academic leadership experience and MLALs managerial competencies)

Before performing multiple linear regression, we run the assumptions for the regression model, a normality check was performed $\rho \leq 0.05$, the collinearity/multicollinearity diagnostics test was done to detect whether there is a correlation among the independent (X1) variables. The results show that no variables had a tolerance value of $VIF \leq 10$ (Hair et al., 2010). This observation confirms that there was no violation of the multicollinearity assumption in this current study. In addition, the Durbin-Watson's d test was used to test for auto-correlations. The results showed that Durbin -Watson's is 1.51, which falls within the values of $1.5 \leq d \leq 2.5$ (implying that there is no auto-correlation) (Kutner et al., 2005). Hence, there is no auto-correlation in the multiple linear regression data.

The qualitative data obtained from the participants were reviewed and transcribed for accuracy. We used MAXQDA 2020 to support the thematic content analysis through the representation of coding schemes and visualisation. The qualitative data were used to support the quantitative results and was deductively analysed.

Table 3. Qualitative sample of MLALs

Participants	Age	Gender	Academic rank	Leader position	ITLTs-prior knowledge	Leader experience
Participant 1	47	M	Senior Lecturer	Coordinator	Yes	5+ years
Participant 2	33	M	Assistant lecturer	Coordinator	Yes	2 years
Participant 3	56	M	Professor	Principal	Yes	8 years
Participant 4	49	F	Senior Lecturer	Dean	Yes	5 years
Participant 5	47	M	Lecturer	HoD	Yes	3 years
Participant 6	43	F	Lecturer	HoD	Yes	5 years
Participant 7	58	M	Professor	Principal	Yes	15 years

3.4 Validity and Reliability

We pre-tested our instruments to ten (10) mid-level academic leaders of the university who hold almost similar qualifications (Sokoine University of Agriculture). The split-half spearman alpha was conducted to perform the reliability of the instruments, and it was found highly reliable (0.9) according to Hair et al. (2010). The qualitative- pilot study involves an interview of 2 mid-level academic leaders at the same pilot university.

The exploratory factor analysis (EFA) was used to determine the validity of research items for each variable through principal component analysis (PCA). Principal Components Analysis (PCA) was carried out using an orthogonal rotation (Varimax rotation), which simplifies the factor structure by maximising the variance of a column in the pattern matrix (Osborne, 2015). The data was suppressed at 0.4 factor loading. Before proceeding with factor analysis, the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's test (BTS) were conducted to determine whether it was appropriate to conduct factor analysis. The results show that KMO was 0.888, implying that the sampling procedure was adequate and (BTS; $\chi^2=843.756$; $df=171$, $p=0.00$) shows that the data for all variables were appropriate for factor analysis.

3.5 Measures

This study's managerial competencies of mid-level academic leaders' scale are based on Lewin's three-step model and literature about managerial competencies (Goleman, 1998). This theory emphasises the driving and resisting forces associated with any change. It further argues that to achieve success in change implementation, its fact lies with ensuring driving forces outweigh resisting forces. Thus, middle leaders must have the managerial competence skills to reduce the resisting forces allowing movement towards the desired state without increasing staff tension. The managerial competencies for change execution were categorised as technical-generic competency needs (Martin & Staines, 1994). The technical-generic competencies based on the study of Cummings and Worley (2003) identified five activities of leadership in change process termed as managerial competencies for leading innovations. These include motivating change (MOTI), creating a vision (VISION), communicate the change (COMM), managing the transition (TRANSI) and sustaining momentum (SUSTAIN). This study adapted the list of generic-technical competencies from the frameworks proposed by Goleman (1998) and used nineteen (19) items, which adequately representing different aspects of technical- generic managerial competencies. The items scored on a five-point frequency rating scale ranging from "1" (low) to "5" (high). The required and the current levels of the mid-level academic leaders for each technical and generic competence were explored. The study used the self-administered questionnaire and web survey for data collection. It used a Likert scale to assess the current and future competency levels.

4. RESULTS

Given RQ1, Table 4 reveals the current level of managerial competencies. The results shows that the mean scores for the five dimensions are significantly different among MLALs. The current level competency with communicating the ITLTs change found a significantly higher mean score of 3.3(SD,0.1) $p \leq 0.05$ than motivating the ITLTs change with the lowest mean score of 2.1(SD,0.1). Generally, the results suggest for low-level competency related to the motivation for ITLTs change among MLALs.

Table 4. Descriptive statistics for the variables among ITLTs-change management competencies subscales

Current level	Mean	SD	Required level	M	SD
Motivating ITLTs change	2.1	0.1	Motivating ITLTs change	4.3	0.3
Managing the ITLTs transition	3.2	0.09	Managing the ITLTs transition	4.2	0.09
Sustaining momentum	3.2	0.1	Sustaining momentum	4.1	0.09
Creating vision for ITLTs	3.05	0.1	Creating vision for ITLTs	4.2	0.09
Communicating ITLTs change	3.3	0.1	Communicating ITLTs change	4.5	0.1

Means are significant at $p < 0.05$. SD=Standard Deviation

Concerning the RQ2, the results reveal that the current managerial competence level for managing ITLTs change is relatively low with mean score of (2.9) among mid-level academic leaders in the selected Tanzania universities. While the required or desired competency level found quite higher with an average of (4.26). Generally, the results revealed the difference of an average of 2.17 competency level for the management of the integration of ITLTs among MLALs.

In view of RQ3, Table 5 presents the regression analysis results from the independent variable X (demographic characteristics of MLALs) which predict the results of dependent variable Y (managerial competencies for enhancing the integration of innovative teaching and learning technologies). Moreover, with regard to the contribution of the independent variables (age, gender, leadership experience, leadership position, and the prior knowledge) on the dependent variables (MOTI, TRANSI, SUSTAIN, COMM, and VISION), the results suggest a range between 12.6% and 17.2% as the contribution of MLALs-demographic characteristics to managerial competencies for the integration of ITLTs dimensions. For MOTI ($R = .355^a$; $R^2 = .152$; $R^2 \text{ adj} = .025$), with regard to TRANSI ($R = .364^a$; $R^2 = .132$; $R^2 \text{ adj} = .032$), similar for SUSTAIN with ($R = .341^a$; $R^2 = .111$; $R^2 \text{ adj} = .015$), VISION ($R = .415^a$; $R^2 = .172$; $R^2 \text{ adj} = .076$) and for COMM, ($R = .355^a$; $R^2 = .126$; $R^2 \text{ adj} = .025$).

Again, the results reveal that independent variables such as age, leadership experience and prior knowledge are a statistically significant predictor of managerial- competencies for enhancing the integration of innovative teaching and learning technologies. Age found to have a significant negative relationship with MOTI and TRANSI ($-.041$; $-.039$). This implies that adults' respondents had a low likelihood of possessing managerial competencies for enhancing the integration of innovative teaching and learning technologies than their counterparts, especially on how to motivate the ITLTs to change and manage the ITLTs transition. Leadership experience was found to have a significant relationship with MOTI and COMM ($\beta_{\text{MOTI}} = .076$, $p = 0.043$; $\beta_{\text{COMM}} = .121$, $p = .001$), signifying that MLALs with leadership experience are highly likely to possess managerial competencies for motivating and communicating the integration of innovative -learning technologies to their subordinates.

The results further show that prior knowledge acquired through [training, self-learning and colleagues] is a statistically significant predictor of VISION and COMM. The findings indicate ($\beta_{\text{VISION}} = -.525$, $p = .026$; $\beta_{\text{COMM}} = -.489$, $p = .045$), showing that MLALs with prior knowledge on the integration of ITLTs are less possessing competencies to create the vision and communicate ITLTs change among academic members of staff. With all the variables of demographic information, the only gender among MLALs did not significantly predict the five dimensions of managerial competencies for enhancing the integration of ITLTs change.

Table 5. Predictors of the constructs of demographic information in the integration of ITLTs change management competencies among mid-level academic leaders

Variables	MOTI		TRANSI		SUSTAIN		VISION		COMM	
	β	ρ								
Age	-.041	*	-.039	*	-.027	ns	-.012	ns	-.003	ns
Gender	.122	ns	-.066	ns	-.076	ns	.069	ns	.024	ns
Academic Leader experience	.076	*	.023	ns	.025	ns	-.025	ns	.121	**
Academic rank	-.093	ns	.066	ns	-.192	ns	-.247	ns	.234	ns
Leader-position	-.186	ns	-.263	ns	-.309	*	-.240	ns	-.214	ns
Prior knowledge	.058	ns	-.204	ns	-.164	ns	-.525	*	-.489	*

* $p < 0.05$; ** $P \leq 0.01$; ns-non significant

Table 6. Themes, sub-themes emerged, code frequencies and participants' quotes for the qualitative results

RQs	Themes	Sub-themes emerged	Code frequencies	Participants quotes (sample)
RQ1.	Motivating ITLTs integration	Awards, token & Rewards; Recognition; ITLTs Training; Technical support	18	"We hardly emphasise ITLTs training to instructors. Training, in most cases, stand as extrinsic motivators for a person to use technology. One can not use technology if he or she misses the technological know-how part likely enough it may increase the chance of change resistance among staff." PARTICIPANT 5, Pos. 270
	Managing the ITLTs transition	Release of ITLTs-use trend reports; Compulsory use of ITLTs initiatives; Recognition of aspects needed for integrating ITLTs; ITLTs capacity building training, ITLTs policies; Leader willingness	43	"As a leader I must show a way to facilitate smooth use of educational technologies, I am supposed to present to the ICT boards, e-learning challenges let's say of internet connections, etc" PARTICIPANT 3, Pos. 337
	Communicating ITLTs change	Advocate ITLTs use through meeting, Awareness campaign via training/seminars;	44	"In fact, uuh.. sometimes we use platforms like departmental/faculty meeting to advocate the teaching - learning technological change..." PARTICIPANT 1, Pos. 401
	Sustaining the momentum for ITLTs	ITLTs policies; ITLTs capacity building training; managing attitudinal & cultural change; Top-level management support	39	People may tend to stay silence in terms of using ITLTs when there is no push mechanism. If we seriously need instructors to use and sustain the use of technologies, attitudinal change should be the first thing to address..." PARTICIPANT 3, Pos. 645

	Creating vision	ITLTs	School/faculty plans	strategic	18	“Any change implementation must have a vision, so even these technological change in teaching should be guided by a certain rule to provide us a direction” PARTICIPANT 3, Pos. 645
RQ3.	MLALs characteristics & managing integration of ITLTs		Age vs management of ITLTs change; ITLTs prior knowledge vs management of ITLTs change.		17	“...technologies are used mostly by youth...in fact you can’t lead something you don’t know, as a leader you firstly need to know the technology so as to direct your subordinates accordingly” PARTICIPANT 7, Pos. 705

5. DISCUSSION

This study devotes to examine the perceived managerial competencies associated with the integration of ITLTs change among mid-level academic leaders (MLALs) in higher education. The general results indicate a moderate managerial competencies level for enhancing the integration of ITLTs. However, mid-level academic leaders were found to have relatively low competency in motivating the integration of ITLTs by academic staff. These results are not due to chance; the majority of the MLALs participated in the interview, emphasising the means that could push extra support, is for them to have specific funds for implementing ITLTs change. “We have only recommendation role as meso level leaders. It is challenging to provide financial rewards to academic staff members who are extremely devoting to integrate ITLTs” (participant, 4).

The findings further indicate that age is negatively associated with competency in managing the transition and motivating the change. It implies that as age increases, the managerial competency for enhancing the integration of ITLTs change by mid-level academic leaders decrease. These results do not seem surprising since most scholars use technology to reveal that elderly hood negatively impacts ITLTs usage (Ke & Kwak, 2013), which can also be similar to its managerial-leadership competencies level. This is because adults are reluctant to learn new skills while young are energetic and eager to learn new knowledge.

According to this study, the leadership experience of mid-level academic leaders was an important factor in determining the competencies among MLALs for enhancing the integration of ITLTs in higher education. The results suggest a significant positive association with motivating the ITLTs to change and communicate the ITLTs change. It suggests that mid-level academic leaders with higher leadership experience are more likely to motivate and communicate the ITLTs change than their counterparts. The findings comply with the study by Weinberg, (2004), who also suggested that experience is a good teacher when it comes to technological change.

The study hypothesised that prior knowledge for ITLTs had a negative beta coefficient that statistically significant influence the managerial-leadership competency level for enhancing the integration of ITLTs. That means prior knowledge among participants do not determine competency level for creating a vision and communicating ITLTs change. The findings are a bit contrary to the scholars who suggest that ITLTs change is significantly associated with lack of training (Etmer,2012, Landa et al, 2020, Tyler- wood *et al*, 2018). The participants' acquisition of prior knowledge through self-learning could explain the contradiction (over 50%); that is, they lack knowledge on creating the vision for ITLTs change. One participant agreed with this, as he suggested training/workshop on change management competencies, especially in this fast pace of technology integration.

6. CONCLUSION

Generally, the study concludes that MLALs have relatively low competency level for motivating the adoption and execution of ITLTs change. Seemingly, the overall current competency level for managing ITLTs change found also relatively low. Furthermore, the results suggest that age, leadership experience, leadership position, and prior knowledge influence the managerial competency level for ITLTs change among mid-level academic leaders. The information generated from the results is crucial for designing the capacity building training

programmes and strategies for integrating ITLTs. Since leadership experience significantly influenced managerial competency in the integration of ITLTs, therefore, this study recommends integrating ITLTs in higher education institutions to consider the leader experience throughout the process.

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