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Testing the validity of academic staff performance predictors and their effects on workforce performance

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ABSTRACT

This study investigated the validity of quality culture (QC) and excellent work culture (EWC) constructs, and their effects on academic staff performance (ASP) mediated by EWC in selected West Malaysian higher education institutions (HEIs). The study included 1,068 faculty members from eight HEIs. The findings showed that QC construct is represented by nine separate elements, whereas two factors index both ASP and EWC. Moreover, the findings established evidence of construct reliability and validity in relation to the elements comprised the three constructs. The findings indicated that quality culture and excellent work culture have direct impact on ASP. The findings also showed that excellent work culture exhibits indirect causal effect on academic staff performance. This empirical study analyzed the mediating effect of EWC on ASP, which has not been extensively examined in the context of Malaysian HEIs.

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1. INTRODUCTION

In any growing organization success is a natural byproduct of quality. Tertiary institutions throughout the world have implemented various strategies to boost employee performance. Quality culture (QC), excellent work culture (EWC), Key Performance Indicators (KPIs), Key Amal Indicators (KAIs), and six sigma (SS) are examples of measurement standards established for maintaining personnel and organizational excellence [1]. There were seven Malaysian higher learning institutions (HEIs), namely Universiti Putra Malaysia (UPM), Universiti Teknologi Malaysia (UTM), Universiti Kebangsaan Malaysia (UKM), University Malaya (UM), Universiti Utara Malaysia (UUM), International Islamic University Malaysia (IIUM), and University Sains Malaysia (USM) in effort to translating the directives of the Malaysia Ministry of Education (MOE) have been part and parcel of this global trend. Yet, the idea of excellence as a vague multi-dimensional term and resulted the assertion that these measurement standards improve ongoing institutional and individual performance excellence remains a contentious with respect to every specific HEI setting [2]. The gap was further coined by Ehlers [3] where the findings reached the conclusion that there is a paucity and absence of empirical work investigating QC direct effects on academic staff performance (ASP)

in the context of HEIs. Significantly, this research examines the ASP as directly measured by QC and mediated by EWC in the context of chosen HEIs in West Malaysia, based on KPIs accounting for the performance excellence in effort to bridge the research gap.

2. QUALITY CULTURE

The ever-increasing demand on HEIs to provide quality education has left HEIs with little choice but to start on a variety of quality improvement strategies [4]–[6]. In order to assure ongoing development, and to maintain a sustained competitive advantage and excellence, HEIs, regardless of size, must integrate quality components into all of its day-to-day operations [7], [8]. All of their workforce have to continuously involve in, and learn from their efforts to maintaining quality culture, whether they plan to start out with quality audits, adopt internal quality systems, or is in the progress of establishing a comprehensive quality through self-critical reviews and various types of external appraisals [6]–[10].

Various elements contribute to an organization's QC development [11]; for example, leadership, management by fact, strategic planning, decentralization, continuous self-development, organizational commitment, teamwork, customer care, and continuous improvement. Interestingly, in an organizational context, top management develop and maintain quality culture through nine practices [12], [13]; support for quality, strategic planning for quality, customer focus, quality training, recognition, empowerment and involvement, quality improvement teamwork, measurement and analysis, and quality assurance. Besides their impact on the development of QC, these elements, in turn, have an impact on ASP as well.

Empirical evidence suggests that QC has a significant impact on the teaching quality of academic staff at postsecondary institutions [7], [13]–[15]. Adebanjo and Kehoe [16], in comparative research that evaluated companies using total quality programs and non-total quality programs, discovered that organizations who implemented QC had considerable levels of improvement in their total quality programs. Corporations that had trouble with QC improvement, however, were incapable to produce innovations that might accelerate dynamic advancement and long-term development. Tertiary quality atmosphere was also observed to exhibit an impact on the behaviors and inspirational levels of employees, hence altering the quality of their activities in the organizational context Likert as cited in [17].

In short, QC is at the heart of a knowledge-based society in its march to achieving excellence. Despite the critical role that QC plays in institutional success, there is a lack of foundational study and conceptual understanding of the problem among HEIs [3]. In a study by Bollaert [18] asserted that quality traditionalism in academic activities, and aspects enticing innovative methods, are clearly visible in today's HEI environments. Generic issues regarding how QC influences ASP or the validity of its notion in HEIs have not been thoroughly defined. As such, this study tested the following hypotheses: i) QC is indexed by nine valid and reliable factor model in the context of Malaysian HEIs (H1); and ii) QC directly influences ASP in the context of Malaysian HEIs (H2).

3. EXCELLENT WORK CULTURE

Dynamic excellent performance produces an excellent work culture. The quality of a given institutional practice determines the culture it generates; excellent practice generates excellent culture [19]. In 1980s, EWC concept was introduced to the Malaysian public sector with a focus on reforming civil servant performance. As argued by Mahathir [20], it is “the need for changing the attitude of civil servants continued to be made throughout the 1980s by top government politicians”. Furthermore, Mahathir [20] stressed that “there is no final target for the search for quality and excellence. It is a moving, (and) never ending effort”. In other words, quality is a journey rather than a destiny.

In an attempt to propagate the functional facets of the EWC, since 1991 through a civil service development circular *Pekeliling Kemajuan Perkhidmat Anawam* (PKPA), where every government agency in Malaysia was given the mandate to regularly monitor the standard of the workplace culture [14], [21], [22]. In this sense, it is important to keep in mind that a conventional strategy cannot effectively materialize EWC overnight. Instead, it is accomplished over a considerable time frame with careful planning, purposeful action, and active dedication. Simply put, EWC as a culture evolves across a set of identity-based values inside two separate though closely related systems, namely a religious system based on the Islamic notion of apparently universal values and an anthropology system based on scientific investigation of local cultural values [11]. Thus, certain ideals emerge within these two systems when EWC enters the center of any organizational culture, whether in manufacturing, business, or education [21], which are identified as two independent elements of EWC, they are Islamic codes of self-conduct (ICSC) and Anthropological objectification (AO) [11].

The core values of ICSC entail being clean, efficient, and trustworthy in the public and private sectors. These core values cut across valuing time, perseverance, wisdom of economy, improvement of talent, obligation and duty, joy of originality, patience, dignity of simplicity, character, influence of examples, pleasure of working and kindness in guiding civil servants incorpoting healthy and desired work culture across Malaysian institutional settings [11]. However, looking at multifarious, multicultural, and multireligious composition of Malaysian public sector, ICSC needs to be supplemented with anthropological values.

The other component of EWC, AO considers the fact that any given organization accommodates diverse workforce in order to stay relevant in the competitive work environment. This translates the importance of AO elements in meeting the diverse needs of diverse workforce. AO comprises values such as generosity, respect, sincerity, righteousness, discretion, feeling of shame at the collective level, feeling of shame at the individual level, harmony and tolerance, preserving face, collectivism, and religiosity [11]. These AO driven elements were informed by the value systems of Malaysian values. Therefore, it is theoretically feasible to contend that values like diligence, commitment, seriousness, sense of accountability are important in relation to any specific organizational performance. But unless EWC is implemented at the operational levels as core culture in the organizational settings, these values will be in vain.

However, there is a dearth of empirical studies entailing the concept because most of the investigations were conceptual. This raises the intriguing need for a quantitative assessment of the EWC scale's reliability and validity. If the results are to be accurate and valid, an instrument must have evidence of both construct reliability and validity of any particular conceptualized component [23].

Given that EWC is core to the organizational settings, EWC is anticipated to have an immediate effect on workforce performance [11]. Thus, tertiary top management [24] should be utilizing EWC an effective tool to ensure staff's organizational loyalty and satisfaction [25]. The EWC had a significant causal impact on ASP at Malaysian HEIs, according to research findings [26]. Additionally, it has been asserted that EWC is the primary factor influencing staff members' EWC [27]. There are, however, few empirical research examining how much EWC mediates the connection between QC and ASP.

The reviewed literature on the variables in this study did not turn up any conceptual or empirical findings supporting the existence of a mediation effect. A significant gap that has yet to be filled is the investigation of the mediating role between the independent and dependent variables of the study. As a result, one of the key contributions of this work to the literature on performance measurement is examining the mediating effects between QC and ASP through EWC. The discussion therefore necessitated the hypotheses: i) EWC factors are valid and reliable (H3); ii) EWC directly influences ASP in Malaysian HEIs (H4); and iii) EWC mediates the relationship between QC and ASP in the context of sampled Malaysian HEIs (H5).

4. CONCEPT OF WORKFORCE PERFORMANCE

The development and retention of an efficient and qualified workforce is an important component of human resource management. Effective workforce leads an organization to be effective and highly productive. A qualified workforce and other organizational factors contribute to an organization's success in general as well as to the nation's revenue base, preserving the business ability to remain competitive in the global marketplace [24].

If effective performance is to be achieved, it is crucial to understand the workforce. While this is going on, a simple misunderstanding between managers and staff members could have unpredictable, chaotic effects on workforce performance, labor turnover, and intention to leave, among other things. As a result, Papis [28] asserted that if organizational goals are to be achieved, a thorough understanding of the workforce is extremely important. A study that polled Scottish hostel attendants about the significance of understanding the workforce suggests that if the task, organizational goals, and business accomplishments are to be successfully completed, a balanced environment, supplemented with the mutual understanding of the workforce, is imperative [28].

The workforce in Malaysia, like that of other developing nations, is viewed as young in comparison to industrialized countries like Japan, the United States, the UK, and others as quoted in [29]. According to the statistics from 1999, 58% of Chinese and over 68% of Malay workers were below 34 years of age [29]. The reviewed literature found that work performance (WP) and job satisfaction (JS) make up the ASP [30] as demonstrated in Figure 1. It is believed that QC serves as strong motivational source to performance of academic staff in any given educational institution. As QC in association with EWC affects ASP positively. In other words, the figure hypothesized that effective organizational setting is indispensable of QA, EWC, and ASP components. Given the foregoing discussion, this research hypothesizes that: Factors constituted ASP construct are valid and reliable (H6).

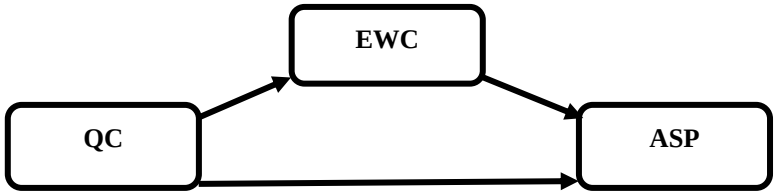

Figure 1. Conceptual model specifying the hypothesized relationships among EWC, QC and ASP in Malaysian HEIs

5. RESEARCH METHOD

5.1. Participants

From a total of 17,448 population, 1,068 (16.34%) were chosen at random from among academic staff members at UM, USM, IIUM, UUM, UTM, UiTM, UKM, and UPM. As recommended by the confidence interval of 95% and the margin of error of 3%, the sample size (1,068) was established [31], [32]. The survey participants were randomly chosen and responded voluntarily to the questionnaires distributed to them. They were asked to respond to the survey instruments with their level of agreement or disagreement. 593 of the delivered surveys that were handed out were returned. Only 582 surveys were retained and analyzed because 11 incomplete surveys were eliminated. This showed a 54.50% response rate ratio.

5.2. Instrumentation

The study examined the causal association between QC and ASP as it was mediated by EWC using a survey questionnaire. In addition to the respondents' demographic data, the questionnaire had 99 items, of which 61 items made up the QC construct [16], 16 items indexed the EWC construct [33], and 22 items encompassed the ASP construct [13]. The development of the EWC and ASP scales began with a thorough assessment of the relevant literature on EWC and ASP at HEIs [11], [21], [24], [26], [28], [29] due to the absence of suitable instruments. The survey is consisted of closed-ended statements. Additionally, it was divided into two main parts. Respondents were asked to answer all statements in section one that asked for general demographic data like gender and educational institution. Section two was divided into three constructs, the first of which included 61 items and looked at the QC at HEIs in West Malaysia. There were 16 items made up the second construct, which examined the EWC at HEIs. There were 22 indexed the final construct that examined ASP at HEIs. Likert scale with seven points was used to collect the data (1=very strongly disagree, 2=strongly disagree, 3=disagree, 4=unsure, 5=agree, 6=strongly agree, and 7=very strongly agree).

5.3. Statistical analysis

Several suggested fit indices were used to assess the measurement and hypothesized models. To evaluate the model's adequacy, indices including the Chi-square statistic (χ^2), the Tucker-Lewis index (TLI, ≥.90), the goodness-of-fit index (GFI, ≥.90), the adjusted goodness-of-fit index (AGFI, ≥.90), the normed fit index (NFI, ≥.90), the minimum discrepancy function by degrees of freedom divided (CMIN/DF χ^2/df, ≤3), and the root mean square error of approximation (RMSEA, .05.08) with its associated confidence intervals with lower bound (LO, ≤.05) and upper bound (HI, ≤.10) ratios were used [34]–[36]. These metrics are important for evaluating models.

6. RESULTS AND DISCUSSION

The analysis of the data obtained was carried out in four steps. Principal component analysis (PCA) through the application PAWS version 21.0 was first carried out to examine the underlying constructs included in the study. Second, confirmatory factor analysis (CFA) was carried through AMOS version 20.0 software in attempt to test the measurement models of the three constructs. Third, structural equation modelling (SEM) was applied to examine the constructs' structural models and causal effects of the variables included in the study [37]. Finally, construct reliability and construct validity were evaluated using average variance extracted (AVE) and composite reliability index (CRI) respectively.

In accordance with the frequencies, 50.7% of the academic staff responses were males, and 49.3% were females. Additionally, according to the responses of the sampled academic staff, 15.3% of them were from UUM, followed by 14.8%, 14.4%, 13.6% from UTM, USM, and UM, respectively. Academic staff from UPM accounted for 12.7% of the replies. It is interesting to note that only moderate responses (11.5%

and 10.7%, respectively) came from academic staff at IIUM and UKM. Last but not least, UiTM's academic staff had the lowest participation rate (7.0%).

6.1. Quality culture principal component analysis

To investigate the underlying structure for the 61 QC items in the questionnaire, PCA with varimax rotation was used. There were 13 interpretable factors retained. However, because three of the removed factors included cross-loaded items and the fourth factor had just one item, only nine factors were kept for further investigation. The nine factors retained were identified as quality improvement teamwork (seven items), customer focus (four items), strategic management for quality (eight items), recognition (six items), top management support for quality (five items), management and analysis (five items), quality training (three items), empowerment and involvement (four items), and quality assurance (four items). The items that were kept were free from factorial complexity problems and met the inclusion criteria (≥.50.50).

Moreover, the measures of sampling adequacy (MSA) for each individual variable established that the correlation between a variable and every other variable ranged between .80 and .96. Additionally, a significant inter-item correlation was established by the item-total correlation, which also ranged from .35 to .75. Previous researchers [36], [38] argued that the instrument makes a good factor of a summed rating scale if the correlation is moderate to high.

In summary, the retained factors have eigenvalues that are greater than 1. The extracted components explained 75.33% of the variance in the QC scores. It is interesting to note that the level of inter-correlation between the elements likewise met expectations. The statistical significance of Bartlett's test of sphericity (BTS) was χ^2 (741)=3501.160, ρ<.001, KMO=.90. Additionally, the reliability of the indexed factors that constitute the constructs had been established through reliability analysis using Cronbach alpha on each factor extracted from PCA. The factors of quality improvement teamwork, customer focus, strategic planning for quality, recognition, top management support for quality, measurement and analysis, empowerment and involvement, quality training, and quality assurance had reliability values of .89, .89, .94, .87, .88, .87, .89, .83, and .84 as presented in Table 1 [39].

Table 1. Principal component analysis of quality culture scale

No.	Item	Factor loading									MSA	M	SD
		QIT	FC	SPQ	REC	TMSQ	MA	EI	QT	QA			
38	Faculty members are very committed to the success of the institution.	.87									.80	4.01	.98
39	Faculty members value quality improvement.	.77									.83	4.10	.84
40	The institution considers expertise in team selection criteria.	.71									.87	4.01	.80
37	Faculty members are involved in quality-related activities.	.50									.91	4.01	.94
32	Customer inputs are taken into consideration prior to program design.		.80								.88	3.66	.72
31	Customer complaints for high quality are entertained.		.73								.85	3.70	.75
30	There is a regular quest for customer feedback for quality improvement.		.70								.88	3.77	.86
33	My institution checks customer service value frequently.		.60								.91	3.71	.79
60	My institution clearly identifies stakeholders' concerns.			.74							.89	3.87	.93
59	My institution clearly identifies stakeholders' needs.			.74							.91	3.93	.84
56	My institution develops a clear vision for future.			.69							.88	4.19	.95
55	My institution develops specific objectives for quality.			.65							.92	4.14	.97
61	My institution develops strategic agendas for quality regularly.			.60							.91	3.97	.77
57	My institutional mandates for quality are clear.			.59							.90	3.95	.82
54	My institution adopts specific goals for quality.			.57							.89	3.85	1.01
58	My institution constantly develops action plans for quality.			.54							.96	4.05	.73
21	My institution rewards people for excellent work carried out.				.70						.88	4.19	.98
22	The recognition system is clear to all faculty members.				.67						.86	3.73	.93
23	The recognition system stimulates faculty members' commitment to quality improvement.				.64						.93	3.92	.89
24	The system encourages workforce participation in quality improvement.				.62						.89	3.89	.98

Table 1. Principal component analysis of quality culture scale (*continued*)

No.	Item	Factor loading									MSA	M	SD
		QIT	FC	SPQ	REC	TMSQ	MA	EI	QT	QA			
25	Excellent suggestions proposed by the faculty members to improve the recognition system are rewarded in my institution.				.60						.88	3.46	1.07
26	My institution is prompt to recognize good performance of the faculty members.				.53						.90	3.95	.88
8	Senior management implements independent quality audit.					.72					.93	3.87	.87
9	Senior management encourages individual quality initiatives.					.71					.81	3.94	.88
11	Senior management quality observations are carried out regularly.					.59					.87	4.06	.86
12	Senior management shows commitment to quality.					.58					.92	3.96	.93
13	Senior management facilitate resources for quality management.					.54					.89	3.94	.85
51	My institution carries out attitude survey regularly.						.80				.89	3.57	.96
52	My institution measures quality of faculty members' relationships regularly.						.74				.87	3.51	.91
50	My institution assesses faculty member performance regularly.						.65				.88	4.07	.87
53	The institution regularly measures faculty member satisfaction level.						.61				.89	3.62	.94
49	In my institution, customer complaints are measured for improvement.						.56				.89	3.94	.96
14	My institution has flexible working policies that allow more empowerment.							.70			.87	3.76	.90
15	My institution has a flexible system that allows more quality involvement.							.64			.88	3.81	.74
17	My institution empowers quality involvement teams.							.60			.94	3.86	.84
18	My institution empowers problem solving teams.							.69			.89	3.75	.92
1	The institution implements quality awareness programs.								.79		.86	4.22	.88
2	The institution provides quality progress feedback to workforce.								.69		.91	3.92	.83
3	The institution organizes quality improvement workshop for workforce.								.62		.87	4.09	.86
46	Workforce of my institution has good knowledge of the quality procedures.									.70	.84	3.97	.77
45	The institution encourages workforce involvement in quality improvement actions.									.63	.91	4.14	.79
47	The institution has standardized quality service delivery procedures.									.59	.85	3.88	.78
44	The institution's central policies are structured in the institutions strategic plans.									.84	.78	4.19	.73
Eigenvalue		28.94	3.27	2.73	2.19	1.88	1.69	1.59	1.40	1.32			
Construct reliability		.89	.89	.94	.87	.88	.87	.89	.83	.84			

Note: Factor loadings less than .50 have omitted and variables have been sorted by loading on each factor. Quality improvement teamwork (QIT), customer focus (FC), strategic planning for quality (SPQ), recognition (REC), top management support for quality (TMSQ), measurement and analysis (MA), empowerment and involvement (EI), quality training (QT) and quality assurance (QA).

6.2. Excellent work culture principal component analysis

To investigate the basic composition for the 16 survey items of the EWC factors, a second PCA was performed. This concept was first hypothesized to have two elements. As expected, the analysis generated two interpretable components with eigenvalues greater than 1. The rotation showed that the EWC construct is accounted for 80.33% of the explained variance. The BTS was found to be statistically significant with a value of χ^2 (120)=4093.20, $\rho<.001$, KMO=.90, indicating that the amount of inter-correlation among the items had achieved an exceptional level. According to the MSA, there was an association between the components that ranging from .83 to .95.

Furthermore, reliability analysis utilizing Cronbach's alpha on each factor obtained from PCA demonstrated evidence of reliability of the elements making up the construct. The Islamic codes of self-conduct, which were each indexed by eight items, and anthropological objectification, which were both indexed by eight items, each had high reliability values of .96 and .95 [39]. The two factors' item loadings ranged from .61 to .89, demonstrating both statistical and practical importance as depicted in Table 2 [36].

Table 2. Principal component analysis of excellent work culture scale

No.	Item	Factor loading ICSC	Factor loading AO	MSA	M	SD
D2	The institutional spiritual principal forms sense of responsibility at my workplace	.89		.91	4.14	.81
D3	The institutional spiritual principal forms sense of sincerity at my workplace	.89		.85	4.11	.84
D4	The institutional spiritual principle enhances attitude of dedication at my workplace	.88		.91	4.10	.79
D6	The institutional spiritual principle develops attitude of diligence at my workplace	.87		.87	4.16	.80
D5	The institutional spiritual principle enhances sense of cleanliness at my workplace	.79		.91	4.11	.80
D7	The institutional spiritual principle enhances sense of cooperation at my workplace	.85		.92	4.12	.86
D1	The institutional spiritual principal forms trustworthiness at my workplace	.78		.92	4.07	.76
D8	The institutional spiritual principle establishes discipline at my workplace	.68		.92	4.08	.80
D15	My institution values collectivism for excellence		.84	.92	4.18	.86
D14	Faculty members of my institution hold respect for authority		.83	.91	4.15	.78
D16	My institution infuses sense of tolerance among faculty members		.82	.93	4.18	.74
D10	In my institution, mutual respect is equally encouraged among faculty members		.75	.91	4.24	.81
D12	My institution values sense of righteousness of its faculty members		.84	.95	4.14	.83
D11	Sincerity is embodied in all activities of my institution		.70	.83	4.01	.89
D13	My institution empowers discretion among faculty members		.75	.89	3.98	.83
D9	My institution promotes generosity among faculty members		.61	.87	4.05	.80
	Eigenvalues	10.24	2.61			
	Construct reliability	.96	.95			

Factor loadings less than .50 have omitted and variables have been sorted by loading on each factor

6.3. Academic staff performance principal component analysis

ASP was also examined using PCA. This concept was first hypothesized to have two elements. According to the research, the 13 items were statistically loaded on two of the initially hypothesized components, WP and JS, each of which had eight and five items respectively. The 68.87% of proportional variance explained was explained by the components that were retrieved. Additionally, the amount of item inter-correlation likewise attained a significant level of significance. The statistical significance of BTS was χ^2 (230)=1339.734, <.001, KMO=.85. The MSA revealed that the correlation across the measure and the other factors, however, was between .73 and .92. However, the items' respective Cronbach's alpha scores of .86 and .88 show that the items are internally consistent [39]. Table 3 provides more details.

Table 3. Principal component analysis of academic staff performance scale

No.	Item	Factor loading JS	Factor loading WP	MSA	M	SD
E20	I am fully able to use my skills in this work environment.	.82		.88	4.29	.92
E19	My profession has become more valuable.	.73		.88	4.44	.84
E23	I am satisfied with benefits offered to me through this work culture.	.69		.87	4.10	1.00
E17	Generally, I am satisfied with the kind of work I do in this profession.	.64		.83	4.65	.89
E16	I am fully able to use my skills in research work.	.74		.84	4.35	.85
E21	I have ample opportunities for advancement in this position.	.73		.82	4.36	.83
E18	I am confident of my abilities in demonstrating more success at my profession.	.52		.92	4.31	.95
E22	Teaching is an important profession to me.	.82		.81	4.97	.99
E5	I try to work as hard as possible.		.83	.80	4.65	.81
E4	It is very important for me to do good at work.		.80	.85	4.87	.95
E6	Participating in opportunities for professional growth is imperative to me.		.63	.85	4.80	.94
E9	I always feel spending extra effort in carrying out my job.		.73	.73	4.51	.78
E10	I feel the relationship between QC and OC is very important to enhance WFP.		.72	.71	4.52	.77
	Eigenvalues	5.68	1.59			
	Construct validity	55.91	64.99			
	Construct reliability	.86	.88			

Factor loadings less than .50 have omitted and variables have been sorted by loading on each factor.

6.4. Construct validity and reliability of the measures

The constructs of EWC, QC, and ASP were evaluated to check the validity and reliability of their psychometric properties. First, CFA was used to evaluate the measurement models for the three constructs. The concept validity, convergent validity, and composite reliability of the retained items were then evaluated using AVE and CRI calculations.

Through the CFA, the CRI—which assesses how thoroughly each structure has been captured by the observed variables—was calculated in order to generate reliability ratings that were more accurate. Given that researchers are advised against heavily relying on Cronbach's alpha to declare a construct reliability due to its limitations, was also tested. [40]–[42]. In contrast to the conventional reliability estimate of Cronbach's alpha, which considers equal weight for the items measuring a given construct and is influenced by the number of items in the construct [43], claims that the CRI estimates rely on the actual readings to compute the factor scores, which is a better indicator of internal consistency. Researchers identified a number of problems with relying solely on the coefficient alpha, including: i) "It does not make allowances for correlated error of measurements nor does it treat indicators influenced by more than one latent variable" [41]; ii) It could exaggerate or minimize dependability [41]; and iii) It is regarded as a lower bound reliability estimate in some way. Furthermore, [44] stated that, in comparison to coefficient alpha, the CRI is a more sophisticated estimate criterion. Therefore, a technique that would enable researchers to assess factor indicator scores more precisely is required [41], [45].

Given the aforementioned factors, the CRI test was conducted to thoroughly assess the validity of the items that were kept through CFA applications. The standard CRI cut-off value is ≥0.70 [44]. If the CRI of each factor is less than ≥0.70 and the AVE is less than ≥0.50, construct validity is proven [36], [44]. The second test conducted was the AVE, which assesses the variation captured by the construct in relation to the variance resulting from measurement error [44]. AVE assesses a particular construct's convergent and discriminant validity [44], [46]. Therefore, it is suggested that in order to provide proof of the construct and convergent validity of a particular construct, a benchmark of .50 should be reached [36], [44], [46].

6.5. Quality culture measurement model assessment

The nine-factor model of the QC construct was evaluated using a CFA with maximum likelihood (ML). The measurement model's early results showed statistics with poor fit, including χ^2 (370)=603.818, CFI=.90, TLI=.88, NFI=.78, RMSEA=0.075 and χ^2/df=1.63. Even though the RMSEA, χ^2/df, and CFI values were within the standard bounds, the total evaluation of the model revealed a poor model fit. The interconnections between the errors 35 (Item EI 17) and 36 (Item EI 15), 5 (Item CF 32) and 43 (Item QA 44), and 9 (Item SPQ 60) were made based on the MIs' suggestions. The inconsistencies were reduced as a result, and a better model fit to the sample data was established, with the following values: χ^2 (376)=565.2, NFI=.90, CFI=.92, TLI=.91, PCLOSE=.054 and RMSEA=.072 with a 90% confidence interval of .060–.084. Additionally, χ^2/df showed a value of 1.5, which, is consistent with [47] as indicators of a good fit.

The QC construct's AVE analysis also showed that all components' AVEs were substantially estimated. The estimates (0.53 to 0.72) met the AVE's recommended value [44]. These results show that the QC subscales have convergent validity. It is interesting to note that the results of the scales' construct reliability were also well supported by the CRI calculation ranging from .77 to .91. These outcomes complied with previous research [36] recommendations, where a CRI of 0.70% is the intended value. Additionally, the factor internal consistency estimates show significant values between .77 and .91 [39]. These findings showed QC is indexed by nine valid and reliable factor-model in the context of Malaysian HEIs and that hypothesis 1 is supported. Tables 4 and 5 show the details.

Table 4. Quality culture subscale factor loadings and goodness of fit

Item	QIT	CF	SPQ	REC	TMSQ	MA	EI	QT	QA
1	.86	.86	.81	.74	.81	.76	.81	.82	.75
2	.81	.87	.84	.80	.81	.80	.73	.88	.92
3	.78	.81	.84	.83	.71	.85	.63	.77	.77
4		.77	.90	.80					

Goodness of fit criteria

χ^2	*df*	NFI	TLI	CFI	χ^2/df	RMSEA	90% CI
565.194	367	.90	.91	.92	1.493	.072	.060-.084

Table 5. Construct reliability and validity of quality culture subscales

Construct	α	AVE	CRI
QIT	0.88	.60	.82
CF	0.89	.69	.90
SPQ	0.94	.72	.91
REC	0.87	.63	.87
TMSQ	0.88	.61	.82
MA	0.87	.65	.85
EI	0.89	.53	.77
QT	0.83	.68	.86
QA	0.84	.67	.86

Note: CRI formula=$(\sum foctor\ loadingd)^2 /(\sum foctor\ loadingd)^2+\sum \varepsilon j$.
AVE formula=$(\sum foctor\ loadingd)^2/(\sum 1-foctor\ loadingd)^2+\sum \varepsilon j$.

6.6. Excellent work culture measurement model assessment

The EWC measuring model underwent another CFA. The initial findings revealed a poor model fit with a statistically significant value of χ^2 (103)=588.608, p=0.001, suggesting an insufficient model fit between the covariance pattern of the observed data and the proposed covariance pattern of the model. The model was then re-estimated using the MIs. Overall, the results showed that the goodness of fit indices of the EWC re-estimated model were in line with the data. The χ^2 statistics was statistically significant (70)=209.276, p=0.001, implying that there is no difference between the covariance matrix of the observed data and the implied matrix of the re-estimated model.

Even though the χ^2 was statistically significant, the re-estimated model fits the data because the value of the χ^2/df was less than <3.00, which statisticians suggest as a better model fit threshold [35]. Other fit indices (CFI=.98, TLI=.97, NFI=.98, GFI=.95, AGFI=.92, PCLOSE=.063 and RMSEA=.05) also demonstrated significant values for the re-estimated model. Moreover, the RMSEA with its CI of the lower and upper bounds also fell within the required zone, with LO .04 and HI .06 offering further evidence of the model's acceptance [34].

Also looked at were parameter estimates, which were observed to be both statistically and practically significant. The loadings were between .55 and .90. They displayed logical direction and were free of any offending estimates. The 14 observed indicators of the EWC re-estimated measurement model had substantial values provided by the SMC measures to explain the variance, satisfying the threshold of .25 for all indicators. The results were between .30 and .81.

Also looked at were parameter estimates, which were found to be both statistically and practically significant. The values were between .55 and .90. They exhibited logical direction and were free of any offending estimates. The 14 observed indicators of the EWC re-estimated measurement model had substantial values provided by the SMC measures to explain the variance and satisfying the threshold of .25 for all indicators. The results were between .30 and .81 [36], [44], [46]. The CRI values also provided strong support for construct reliability in Islamic self-conduct codes .94 as well as anthropological objectification .93. These results exceeded the CRI's 0.70 recommended cut-off value [44]. Additionally, the results of the variables' internal consistency showed significant values between .96 and .95 [39]. Additionally, the results of the variables' internal consistency showed significant values between .96 and .95. Refer to Tables 6 and 7 for more details.

Table 6. Excellent work culture subscale factor loadings and goodness of fit

Item	Islamic codes of self-conduct				Anthropological objectification		
1	.83				.78		
2	.90				.83		
3	.89				.86		
4	.85				.90		
5	.55				.83		
6	.89				.80		
7	.84				.66		
Goodness of fit criteria							
χ^2	*df*	NFI	TLI	CFI	χ^2/df	RMSEA	90% CI
209.276	70	.972	.975	.981	2.990	.059	.049-.068

Table 7. Construct reliability and validity of excellent work culture subscales

Construct	α	AVE	CRI
Islamic codes of self-conduct	.96	.69	.94
Anthropological objectification	.95	.59	.92

6.7. Academic staff performance measurement model assessment

With χ^2 (64)=844.924, p=0.001, the final CFA measurement model of ASP's results demonstrated poor model fit. The findings of a Post Hoc MIs demonstrate that the ASP's goodness-of-fit indices were consistent with the data. The value of the χ^2/df was below 3.00, which statisticians recommend as a threshold for a good model fit, therefore even though the χ^2 was statistically significant, the re-estimated model fitted the data. Moreover, other fit indices (CFI=.98, TLI=.97, NFI=.97, GFI=.96, AGFI=.94, RMSEA=.05, and PCLOSE=.061) also demonstrated significant indicator values for the re-estimated model. These results show a well-fitting model [36]. Remarkably, the RMSEA's CI of the lower and upper bounds also fell within the anticipated zone, with LO=.04 and HI=.07 providing additional evidence that the model is valid [34]. A close fit is demonstrated by the PCLOSE, which shows that the calculated RMSEA is not more than .05.

It is interesting to note that the parameter estimations, which ranged from.58 to. 90, were also analyzed and found to be statistically significant and important. They displayed logical direction and were free of any offending estimates. Additionally, the ASP re-estimated measurement model revealed SMC values between .34 and .81, indicating that the threshold was met.

Moreover, the AVE estimations' values for job satisfaction (.61) and work performance (.68) provided confirmation of the ASP subscales' convergent validity [44]. Also, the CRI demonstrated significant results, showing high CRI values of .91 for WP and JS in the ASP construct. These results further provided evidence that the subscales of the ASP are valid and reliable. Finally, the results of the components' internal consistency show significant values between .88 and .86 [39], [45]. These findings demonstrated that hypothesis 6 is supported by the finding that the components of the ASP construct are reliable and valid. Tables 8 and 9 illustrate the details.

Table 8. Workforce performance subscale factor loadings and goodness of fit

Item	Work performance			Job satisfaction		
1	.77			.80		
2	.85			.85		
3	.80			.90		
4	.88			.81		
5	.81			.70		
6				.58		
Goodness of fit criteria						
χ^2	*df*	NFI	TLI	CFI	χ^2/df	RMSEA	90% CI
113.623	40	.971	.974	.981	2.841	.059	.046-.072

Table 9. Construct reliability and validity of workforce performance subscales

Construct	α	AVE	CRI
Work performance	.88	.63	.91
Job satisfaction	.86	.51	.87

6.8. Causal analysis through structural equation modelling

Using data gathered from a sample of 582 academic staff, the hypothesized academic staff performance model (ASPM) was calculated using the ML techniques. The goodness-of-fit indices and the adequacy of parameter estimations were used to assess the model's output. In the analysis, the SMC of the manifest variables was also calculated. Furthermore, the inter-variable correlations of the scales that were combined were examined, and it was discovered that all measures exhibited statistical significance. Each variable's correlation in the ASPM is displayed in Table 10.

The outcomes of the full-fledged SEM for the ASPM showed significant fit indices. The analysis showed that the χ^2 (60)=110.577, p=0.001 was significant. Even though the χ^2 was statistically significant, the hypothesized model is well-fitted according to various goodness-of-fit indices, including χ^2/df=1.64, CFI=.98, TLI=.97, NFI=.94, GFI=.90, AGFI=.89, PCLOSE=.063, RMSEA=.08 and RMSEA's CIs LO=.05 and HI=.09. The estimated RMSEA is not more than .05, indicating a close match, and the resulting PCLOSE further supports this conclusion, supporting the conclusion that the associated null hypothesis was not rejected. The huge sample size (n=582) might influence the statistical significance of the χ^2 statistic. The sensitivity of the χ2 significance to large sample size (≥200), which most likely contributes to its significance, led to its omission. As a result, the χ2 test should not be the only factor considered for rejecting a model. This model's complexity, the CFI criterion of. 90, and the RMSEA level of ≤.08 all indicate a good fitting model. The obtained goodness-of-fit values provided additional evidence for the adequacy of the proposed model [36], [45]. Figure 2 depicts the details.

Table 10. Inter-variable correlations

	SPQ	MA	QA	QIT	CF	REC	EI	TMS	QT	AO	ICS	JS	WP
SPQ	1.000												
MA	.855	1.000											
QA	.789	.828	1.000										
QIT	.731	.799	.772	1.000									
CF	.804	.823	.764	.749	1.000								
REC	.779	.738	.662	.696	.806	1.000							
EI	.734	.666	.592	.629	.678	.817	1.000						
TMS	.695	.696	.612	.643	.605	.700	.750	1.000					
QT	.683	.716	.635	.582	.622	.671	.618	.708	1.000				
AO	.793	.821	.739	.705	.776	.725	.663	.699	.680	1.000			
ICS	.816	.832	.749	.698	.794	.727	.641	.670	.673	.901	1.000		
JS	.499	.495	.379	.296	.464	.546	.558	.512	.471	.543	.549	1.000	
WP	.657	.659	.558	.552	.580	.601	.583	.578	.506	.715	.716	.674	1.000

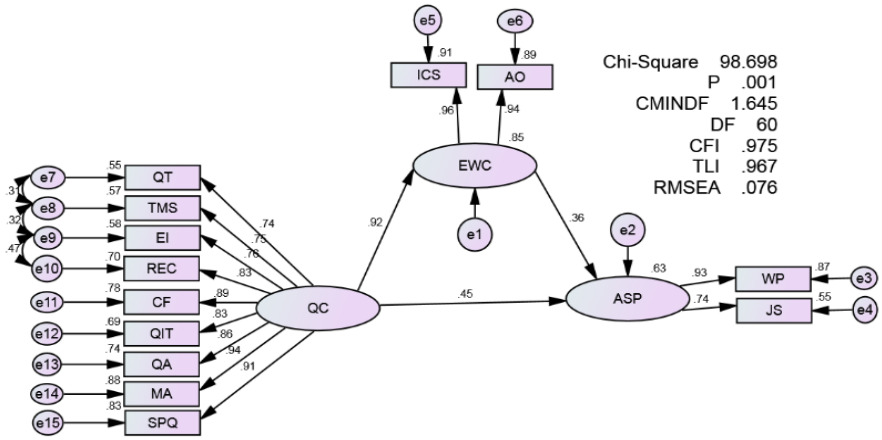

Figure 2. The generated output of the hypothesized ASPM

Furthermore, the analysis of parameter estimations revealed significant loading between .75 (JS) and .95 (ICS). By adjusting the other model variables, the study demonstrated that the direct path coefficient between QC and ASP was the biggest (.45) and statistically significant (more than 0.20). This means that for every unit rise in QC, there will be an increase in ASP of. 23 units. This finding indicated that the ASP was significantly impacted by QC components. The outcome also showed that the direct impact of QC>ASP at the HEIs sampled was accounted for by the high QC value to the endogenous. This result revealed that better WP and JS of the academic staff in their different universities are caused by an established QC. This result is consistent with [13]–[15], [26], [48] who arrived at the conclusion that good QC improves WP and JS measurements. This finding is in agreement with Likert as well, according to Pashiardis [17] who discovered that a strong QC culture impacts staff performance in general as well as the caliber of their work. The foregoing finding thus supported hypothesis 2 by showing that QC has a direct impact on ASP in the case of Malaysian HEIs.

The direct path coefficient between EWC and ASP also had a statistically significant value of .36 [35]. As a result, the academic staff WP and JS in the selected HEIs are significantly predicted by EWC. The result is consistent with [26] who demonstrated that the EWC had a significant direct causal effect on ASP in the Malaysian HEIs. In addition, the finding is consistent with [27] who asserted that EWC significantly improves staff work excellence. This result revealed that better WP and JS among academic staff is caused by an EWC in the institutional environment. In other words, if a higher EWC is maintained in the institutional settings, the WP and JS of the academic staff would rise. As a result, it is established that hypothesis 4 is supported.

The size of the indirect causal effect of QC on ASP through EWC was calculated and revealed .92 x .36=.33, which was significantly more than the proposed value of .08 [35]. According to this finding, EWC strongly mediates the association between QC and ASP. This result was consistent with [26] who arrived at the conclusion that QC and ASP's interaction is strongly mediated by EWC. In other words, EWC strongly mediates the association between QC and ASP in the context of sampled Malaysian HEIs. This result also confirmed hypothesis 5.

The regression weights also reveal the significance of the loadings for the manifest variables. The magnitude of all values was higher than 1.0. Additionally, all critical ratios (CRs) were higher than the threshold value of 1.96. This data demonstrates that QC has the strongest predictive direct power .45 for ASP whereas EWC has a strong predictive direct power .36 for ASP, further demonstrating the theoretical grounds' coherence in terms of the supported hypotheses. Furthermore, EWC mediates the association between QC and ASP with a significant mediation magnitude of 33. These findings are clear confirmation that hypothesis 6 is supported. The parameters for the values of the CRs and standard regression weights are shown in Table 11.

Table 11. Regression weights, critical ratios, and significance level

			Estimate	S.E.	C.R.	P	Label
EWC	<---	QC	.727	.240	3.029	.002	par_1
WFP	<---	QC	1.000				
WFP	<---	EWC	1.000				
QT	<---	QC	1.000				
TMS	<---	QC	1.558	.182	8.546	***	par_2
EI	<---	QC	1.453	.170	8.531	***	par_3
REC	<---	QC	2.278	.241	9.466	***	par_4
CF	<---	QC	1.669	.166	10.032	***	par_5
QIT	<---	QC	1.483	.159	9.324	***	par_6
QA	<---	QC	1.582	.163	9.722	***	par_7
MA	<---	QC	2.130	.197	10.802	***	par_8
SPQ	<---	QC	3.240	.309	10.482	***	par_9
ICS	<---	EWC	3.969	1.168	3.400	***	par_10
AO	<---	EWC	3.523	1.037	3.396	***	par_11
JS	<---	WFP	1.000				
WP	<---	WFP	1.031	.116	8.912	***	par_12

7. CONCLUSION

The findings reached the conclusion that building strong QC environment aids not only institutional performance but also the performance of the academic staff. Thus, EWC has a direct impact on the WP and JS of academic staff in West Malaysian HEIs. The results also showed that in the HEIs sampled, there was a significant direct causal relationship between EWC and ASP. As a result, the WP and JS of academic staff increases if institutional settings sustain greater EWC. In other words, WP and JS rise as top management in tertiary institutions uses EWC components to promote excellence-work culture among academic staff. The findings revealed that EWC can predict academic staff WP and JS in conjunction with other variables (EWC) among the HEIs sampled. Staff WP and JS in HEIs are influenced by QC directly and indirectly. Therefore, a strong QC alone can exhibit a good effect on the WP and JS of academic staff. The findings had shown that EWC partially mediated the QC variable and accounted for significant indirect effect in the context of the selected HEIs, which is one of the significant contributions of this research which investigated the mediating effects between ASP and its potential determinants. As a result, tertiary institutions should consider several aspects of excellence, rather than just focusing on one area for all students to excel at.

The study theoretically proved with empirical evidence existence of mediating effect amongst QC and ASP via EWC in relation to the HEIs in West Malaysia. The ASP determinants may provide theoretical foundation for future study into influencing additional ASP behavioral elements, particularly with regards to relevant sectors where human behavior plays a crucial role. In future research, the psychometric indices of ASPM and its determinants should be studied further to improve their support and comprehension in various situations. The research further makes hands-on contributions to the functional research in the HEIs' settings. By implementing QC and EWC measures, such practical contributions support ASP activities throughout selected Malaysian HEIs. Precisely, the results will assist educational supervisors, institutional top management, program designers, quality managers in redesigning different effective strategies for developing quality program that help improve quality management associated with the ASP in HEIs. The results are important for policymakers as well as human resource managers and professionals. In order to continuously improve QC and EWC among university academic staff, practitioners and professionals in human resource development may use the findings to support their efforts in creating appropriate learning and performance improvement interventions and their design, development, and implementation. The ASPM provides university management with a reliable tool for examining administrative staff WP and JS in the context of HEIs with only a few minor adjustments.

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