

Academic Environment and Its Effect on Faculty Performance in Higher Education Institution

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Abstract— The present study aims to see how the academic atmosphere affects instructor performance. For the recruitment of individuals, a non-probability purposive sampling strategy was used. Data was collected from 405 faculties using a pre-tested questionnaire. The data was analysed using descriptive statistics, confirmatory factor analysis, and structural equation modelling. Internal consistency and reliability of scale items, as well as convergent and discriminant validity of the questionnaire constructs, were proved by factor loading, Cronbach's alpha, composite reliability, average variance extracted, and correlations. The model fit indices revealed that measurement and structural models relating quality education, student background, faculty professional capabilities, student/teacher ratio, faculty engagement, collaborative research, presence of quality assurance cell/agencies, institution policies, industry-institution collaboration, and physical environment of the educational institute with faculty performance in higher education institutions were well fitted with data. The structural model's path analysis revealed that quality education, student background, faculty professional capabilities, student/teacher ratio, faculty engagement, collaborative research, the presence of quality assurance cells/agencies, and the institution's policies on industry-institution collaboration were all important factors. In higher education institutions, the physical environment has a large and favourable impact on faculty performance. The background of the students has little bearing on the performance of the professors. The structural model's path analysis revealed that faculty professional capabilities and collaborative research were the most important determinants, followed by quality education, student background, student/teacher ratio, faculty engagement, presence of quality assurance cell/agencies, institution policies, industry-institution collaboration, and so on. Faculty performance in higher education institutions is influenced by the physical environment of the educational facility.

Keywords: Quality Education; Determinants; Faculty Performance; Collaborative Research; Confirmatory Factor Analysis; Structural Equation Modeling

I. INTRODUCTION

India's higher education system has evolved tremendously, notably in the post-independence period, to become one of the world's largest systems of its sort. Since the dawn of time, education has continued to expand, diversify, and broaden its scope and breadth. Every country in the globe develops its own system to express and encourage its distinctive socio-cultural identity, as well as to solve current difficulties. Higher education is a system in which secondary students are the inputs and graduates, postgraduates, doctors, engineers,

and other professionals become the nation's most valuable resources and assets. Building higher education holds a unique place in each country's educational system, since it is at the top of the overall educational pyramid, influencing all levels of education. In reality, it has an impact on almost every key national activity by providing labour for numerous fields of production, planning, management, and technical advancement. Higher education, on the other hand, is defined as all types of education (academic, professional, technological, and teacher education) provided in institutions and colleges where (a) the basic entrance requirement is the completion of secondary education, (b) the average entrance age is around 18 years, and (c) the courses lead to the awarding of a named award (degree, diploma, or certificate) of higher studies. Higher education, according to the National Policy on Education (1986), is a crucial ingredient for survival because it allows Indians to reflect on the critical social, economic, cultural, moral, and spiritual challenges that face civilization. It contributes to the development of the nation by disseminating knowledge and skills. As a result, it is a critical determinant for survival. Teachers play a critical role in preserving the need for further education and subsequent advancement in the educational pyramid. As a result, the educational system's production of such teachers increases significantly. Institutions of national importance include higher education institutions, colleges, and universities that are recognized to be universities. Universities can be single-faculty or multi-faculty, affiliating or non-affiliating, single-campus or multi-campus for general education. Aside from that, several technical universities, agricultural universities, and higher education institutions in medical, science and research, engineering and technology, social science, culture and language, and management are considered universities. Colleges that offer undergraduate, postgraduate, or both degrees are usually run by the government, or by a government-aided or private administration that is associated with a university or independent in character. Following independence, the Indian government developed its own higher education programme based on ideological, cultural, and political principles. The study was written by Dr. S. Radhakrishnan, Chairman of the University Education Commission in 1948, and was titled "Education for Excellence. Several agencies in India are primarily responsible for higher education. The University Grants Commission (UGC) oversees all higher education, while the All India Council of Technical Education (AICTE) oversees technical and management education, the Indian Council of Medical Research (ICMR) oversees medical and dental education, and the Indian Council of Agricultural Research (ICAR) oversees agriculture and veterinary education. Other statutory bodies that coordinate higher

education in India include the Medical Council of India (MCI), the Central Council of India, the Institute of Engineers India (HE), the National Council of Teacher Education (NCTE), the Indian Council of Agricultural Research (ICAR), the All India Institute of Management Studies (AIIMS), and a few others at the state level. Until now, there has been another form of higher education coordination agency called the Association of Indian Universities (AIU). The University Grant Commission (UGC) of India correctly stated the country's higher education purpose in the Task Force report, stating that higher education should strive for academic excellence, growth in the arts, and science. Education, research, and extension should be carried out in accordance with our national requirements and priorities, ensuring that our greatest talents contribute appropriately to international endeavours that address societal demands.

II. THEORETICAL BACKGROUND AND DEVELOPMENT OF HYPOTHESES

A. Quality of Education.

The importance of quality and education in society cannot be overstated. Getting a good education is a crucial pillar in assessing a country's future, since it reflects the level of educational growth it is undergoing (Pedro et al., 2020). As a result, ensuring the quality of higher education is critical for societal progress (Salas-Zapata et al., 2018). The term relates to the quality of a service, notably in the context of higher education research (Rickman, 2012). Initial educational studies show that the concept of quality in higher education has grown muddled, and that quality is determined by comparing service expectations to the impression of actual service obtained (Seymour, 1992; Green, 1994; Quinn et al., 2009; Madani, Rehaf. 2019). Cameron et al. found that the study focuses on incorporating successful participation techniques into the teaching process, inspiring people to learn, the educational community, social future, knowledge, skills, attitudes, and core values.

H1: Quality education is positively related to faculty performance.

B. Background of Students

Academic integration refers to both satisfying stated rules, such as passing grades, and the institution's normative academic principles, such as an engineering school emphasising physical sciences above the arts. The degree to which a student perceives the institution's social environment to be conducive to his or her preferences, which are moulded by the student's history, values, and goals, is referred to as social integration. Academic integration measures satisfaction with academic achievement and major choice, whereas social integration is frequently assessed as a composite of peer-to-peer contacts and faculty-student interactions (Trigwell, 2010; Lin & Liou, 2019). As a result, student persistence is a consequence of the individual's dynamic interactions with other actors at the institution and their home community. Expectations are shaped to differing degrees by precollege qualities and experiences. Students with outstanding academic high school records, for example, were more likely to participate in a variety of activities throughout college, according to (Masui et al., 2014; Niessen

et al., 2018). Student demographic and background factors have a minor, if not non-existent, impact on their college experiences and outcomes. When compared to students with relatively high expectations, students with relatively low expectations were more likely to report college experiences that matched their low expectations.

H2: Student background is positively related to faculty performance.

C. Professional Capabilities of faculty

The number of years and the ability to teach well in the classroom are referred to as a faculty member's professional capabilities. Several studies have found a link between teacher experiences and student achievement (Wayne and Youngs 2003). Researchers in North Carolina, for example, discovered that teacher experience was positively associated to student success in both reading and mathematics using data from 4000 instructors (Clotfelter et al. 2006). Rice (2003) discovered that the link between a teacher's professional talents and student success was strongest for secondary pupils. (Wiswall,2013; Papay and Kraft,2015 and Ladd and Sorenson,2017), as well as a Dutch twin research by Gerritsen et al., (2014) found that teacher experience had a cumulative influence on student outcomes at schools in the United States.

H3: Professional capability is positively related to faculty performance.

D. Student/Teacher Ratio.

Many researchers have looked at the efficacy of faculty and their role in delivering high-quality education. Researchers in those studies have emphasised the importance of teacher-student contact in a successful education and academic accomplishment (Graue, Rauscher & Sherfinski, 2009). (Hamre et al.,2007 and La Paro et al.,2004) stated social and academic contact between instructors and students as a critical driver of academic achievement. The interaction between instructors and students is thought to be influenced by teacher and student characteristics. Other factors, such as the number of kids per instructor in a school, also influence this connection. Class size is generally associated with the number of students per teacher, and it is widely assumed that smaller classes provide better teaching and learning opportunities. Many countries, including the United States, Europe, China, Japan, and others, share this idea, and have implemented laws to minimise class sizes (Blatchford & Lai, 2012).

H4: Student teacher ratio is positively related to faculty performance.

E. Faculty engagement

(Perkmann et al., 2013) Faculty engagement, as opposed to teaching and commercialization, refers to knowledge-related contacts between academic researchers and non-academic organisations. Collaborative research, contract research, and consultancy are examples of these connections, as are informal activities like offering ad hoc advice and networking with practitioners. Faculty involvement, in addition to commercialization and teaching, is a significant aspect of academics' portfolio of activities. Faculty participation has piqued the curiosity of scientific and university students, as well as the general public, since our first review. It is a focus

of concern for universities and policymakers now more than ever, since it is considered as a transmission mechanism for ensuring that academic research has an influence on the economy and society (Martin, 2011; Bornmann, 2013). Faculty involvement is more frequently practised across disciplines and has higher economic value for universities and enterprises than commercialization producing intellectual property and faculty entrepreneurship (Cohen et al., 2002; Hughes and Kitson, 2012; Hughes et al., 2016).

H5: Faculty engagement is positively related to faculty performance.

The conceptual model of the present study is based on aforementioned research findings to assess the role of quality education, student background, professional capability, student teacher ratio, and faculty engagement influencing faculty performance (Figure 1).

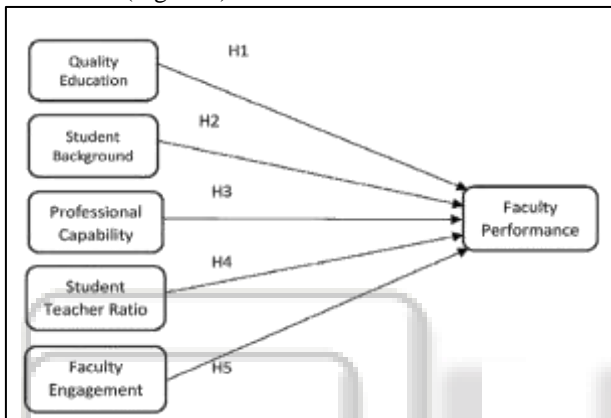


Fig. 1: Conceptual Framework

Constructs	Source
General information	Geeroms et al., (2008); Januszewska et al., (2011).
Quality education	Salas-Zapata et al., (2018); Madani, Rehaf. (2019); Pedro et al., (2020).
Student background	Masui et al., (2014); Niessen et al., (2018); Lin & Liou, (2019).
Professional capability	Jarvis, P. (2007); Brookfield, S. (2012); Illeris, K. (2014);
Student teacher ratio	Hamre et al., (2007); Blatchford, P. (2003); Blatchford, P., & Lai, K. C. (2012)
Faculty engagement	Alfes et al., (2013); Anitha, J. (2014); Chan et al., (2008)

Table 1: Constructs of the questionnaire and their sources

B. Respondents

The respondents comprised of students and teaching staff from universities and colleges. The respondents consisted of 41.3% of males and 58.7% females. The age of the respondents ranged from 25 to 65 years (average age = 30.37 years). The respondents educational level ranged from postgraduate to doctoral i.e. (34.5%), and doctoral (65.5%). The yearly income of the respondents varied from Rs 40000 to Rs 5000000.

C. Sampling method and sample size

The non-probability purposive sampling method was adopted for the recruitment of the respondents because researchers were targeting a specific group of respondents as they are working in higher education institution (Madani, Rehaf, 2019; Anitha, J, 2014). The present study comprised of 405 respondents from two cities of Uttar Pradesh. The total population of two cities is approximately 5.25 million. The sample size of 434 respondents taken in this study was more than 384 as recommended for the population over 0.25 million with confidence level of 95% and 5% margins of error

III. RESEARCH METHOD

A. Development, pre-testing, and structure of the questionnaire

Quality education, student background, professional competency, student-teacher ratio, and faculty engagement were all factors considered when developing the questionnaire. A questionnaire was developed based on the review of literature indicated in Table 1 and comments from participants to investigate the influence of the aforementioned criteria on faculty performance. The questionnaire was pre-tested at India's Madhu Vaachaspati Institute of Technology (MVIT) in Prayagraj. Several testing were carried out to confirm the questionnaire's correctness and reliability (Grim, 2010). Thirty university and college staff members participated in a pre-testing of the questionnaire. After completing the survey, respondents were requested to provide comments on the questionnaire's design, organisation, and interpretation in order to measure the impact of the aforementioned drivers on teacher performance. The respondents' ideas were incorporated into the final questionnaire to ensure data collecting accuracy (Pieniak et al., 2009; Wang et al., 2015; Konuk, 2019).

(The Research Advisor, 2006). The 29 respondents were not considered because they provided incomplete information. Thus, the final sample size was 405, with response rate of 93.3%.

D. Collection of Data

The structured questionnaire was circulated among 434 respondents in three universities, seven vocational training centres. The respondents were requested to gather at the conference / meeting rooms provided by the universities and vocational training centres. The respondents were informed in advance regarding time and venue to achieve desired number of respondents. A group of 30 respondents were invited to complete the questionnaire. The researcher distributed the questionnaire to the respondents and briefed them about purpose, objectives and importance of the study. The influence of aforementioned determinants on faculty performance were determined on five-point likert scale. The respondents were asked to choose one from 1 to 5 for each question (Contini et al., 2018).

E. Data analysis

The statistical software SPSS version 27 was used to determine the mean, standard deviation skewness and kurtosis of each item. Further, SPSS version 27 was used to evaluate Cronbach's alpha of constructs to ensure internal consistency and reliability of scale items of the questionnaire (Taber, 2018). The AMOS software version 26 was employed for confirmatory factor analysis (CFA) and structural equation modeling (SEM).

IV. RESULTS

A. Descriptive statistics

Table 2 reflects the mean score of variables and different items of variables i.e. quality education, student background,

professional capability, student teacher ratio, and faculty engagement. The mean respondents score indicated that Professional capability of faculty was the most important determinant influencing faculty performance in higher education institution followed by moral quality education, student background, student teacher ratio and faculty engagement. The skewness for different items of quality education, student background, professional capabilities of faculty, student teacher ratio, faculty engagement and faculty performance were within the threshold values of -1 to 1 (Table 2). The kurtosis for different items of quality education, student background, professional capabilities of faculty, student teacher ratio, faculty engagement and faculty performance ranged within the threshold values of -2 to 2 (Table 2).

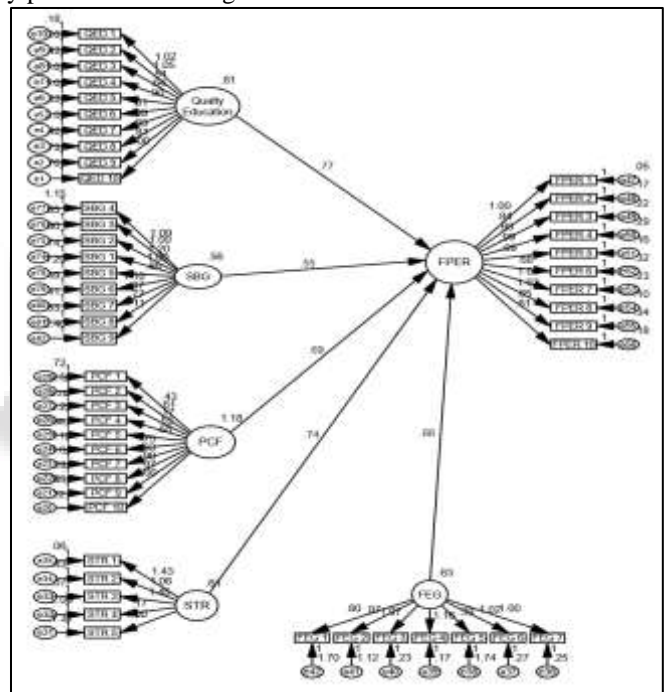
Construct	Item	Factor loading (β)	p-value	Cronbach alpha	Composite reliability (CR)	Average variance extracted (AVE)
Quality Education (QED)				0.801	0.932	0.711
	QED 1	0.862	***			
	QED 2	0.814	***			
	QED 3	0.765	***			
	QED 4	0.902	***			
	QED 5	0.785	***			
	QED 6	0.913	***			
	QED 7	0.889	***			
	QED 8	0.804	***			
	QED 9	0.814	***			
	QED 10	0.875	***			
Student background (SBG)				0.741	0.870	0.744
	SBG 1	0.885	***			
	SBG 2	0.953	***			
	SBG 3	0.904	***			
	SBG 4	0.763	***			
	SBG 5	0.839	***			
	SBG 6	0.890	***			
	SBG 7	0.866	***			
	SBG 8	0.785	***			
Professional Capabilities of faculty (PCF)				0.876	0.940	0.747
	PCF 1	0.833	***			
	PCF 2	0.879	***			
	PCF 3	0.925	***			
	PCF 4	0.718	***			
	PCF 5	0.762	***			
	PCF 6	0.963	***			
	PCF 7	0.948	***			
	PCF 8	0.856	***			
	PCF 9	0.731	***			
Student/Teacher Ratio (STR)				0.809	0.929	0.630
	STR 1	0.714	***			
	STR 2	0.795	***			
	STR 3	0.865	***			
	STR 4	0.753	***			
	STR 5	0.833	***			
Faculty Engagement (FEG)				0.830	0.903	0.721
	FEG 1	0.843	***			
	FEG 2	0.764	***			

	FEG 3	0.916	***			
	FEG 4	0.861	***			
	FEG 5	0.898	***			
	FEG 6	0.824	***			
	FEG 7	0.832	***			
Faculty Performance (FPR)				0.960	0.839	0.743
	FPR 1	0.923	***			
	FPR 2	0.892	***			
	FPR 3	0.917	***			
	FPR 4	0.856	***			
	FPR 5	0.769	***			
	FPR 6	0.911	***			
	FPR 7	0.803	***			
	FPR 8	0.811	***			
	FPR 9	0.832	***			
	FPR 10	0.791	***			
Measurement model fit indexes: CFI= 0.921; TLI= 0.895; GFI=0.872; RMSEA= 0.069; SRMR=0.044						

Table 2: Mean score of respondents, factor loadings, Cronbach’s alpha (α), composite reliability (CR) and average variance extracted (AVE) of determinants influencing faculty performance in Higher Education institution.

B. Structural model

Table 2 presents factor loading, alpha (α), composite reliability (CR), and average variance extracted (AVE) for quality education, student background, professional capabilities of faculty, student teacher ratio, faculty engagement and faculty performance. The factor loading of the different items of quality education, student background, professional capabilities of faculty, student teacher ratio, faculty engagement and faculty performance ranged from 0.714 to 0.960, which exceeded the minimum cut off point of 0.50, therefore all items were included for the interpretation of the factors influencing faculty performance in higher education institution. Cronbach's alpha for quality education, student background, professional capabilities of faculty, student teacher ratio, faculty engagement and faculty performance determinants ranged from 0.731 to 0.901, which exceeded the minimum acceptable value of 0.70 (Nunnally, 1978). Composite reliability of quality education, student background, professional capabilities of faculty, student teacher ratio, faculty engagement and faculty performance determinants ranged varied from 0.741 to 0.960 higher than the recommended cut off value of 0.70. Cronbach's alpha and composite reliability values obtained for different constructs revealed good internal consistency and reliability of scale items of the questionnaire (Hair et al., 2010). The average variance extracted (AVE) for quality education, student background, professional capabilities of faculty, student teacher ratio, faculty engagement and faculty performance. The factor loading of the different items of quality education, student background, professional capabilities of faculty, student teacher ratio, faculty engagement and faculty performance factors varied from 0.538 to 0.864, which exceeded the threshold value of 0.50 (Fornell and Larcker, 1981). The factor loading higher than 0.60 and average variance extracted higher than 0.50, confirmed the convergent validity of the constructs (Fornel and Larcker, 1981; Hair et al., 2010).



Structural model fit indices: CFI= 0. 936; TLI= 0. 918; GFI= 0. 913; RMSEA= 0.071; SRMR=0.074; $\chi^2/df = 3.2$
Fig. 2: Structural equation modelling to assess the role of quality education, student background, professional capabilities of faculty, student teacher ratio, faculty engagement and faculty performance

The Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Goodness of Fit Index (GFI), Root Mean Square Error of Approximation (RMSEA) and Standardized Mean Square Residual (SRMR) were used to assess the fit of measurement model relating quality education, student background, professional capabilities of faculty, student teacher ratio, faculty engagement and faculty performance. The CFI was 0.936 (≥ 0.90); TLI was 0.918 (≥ 0.90); GFI was 0.913 (≥ 0.90); RMSEA was 0.071 (≤ 0.08) and SRMR was 0.074 (≤ 0.08), which were within the recommended threshold values (Table 2). The values of the above mentioned indices confirmed a satisfactory fit of the

measurement model with data (Hu and Bentler, 1999; O'Connor et al., 2017).

Hypothesis	Structural Path	Standardized estimate (β)	Standard error (SE)	t-value	p-value	Results
H1	Quality education → Faculty performance	0.722	0.024	22.546	***	Supported
H2	Student background → Faculty performance	0.103	0.040	1.184	.209	Rejected
H3	Professional capability → Faculty performance	0.784	0.028	30.287	***	Supported
H4	Student teacher ratio → Faculty performance	0.717	0.028	28.683	***	Supported
H5	Faculty engagement → Faculty performance	0.745	0.044	13.232	***	Supported

*** Significant at $p \leq 0.01$

Table 3: Structural model results to examine the association between quality education, student background, professional capability, student teacher ratio, faculty engagement and faculty performance

Hypothesis 1 (H1), that postulated positive influence of quality education on faculty performance was supported as standardized estimate (β) of the path of structural model was significant (β = 0.722, t-value = 22.546, $p \leq 0.01$). Hypothesis 2 (H2), which proposed positive influence of student background on faculty performance was rejected because the standardized estimate of the path of structural model was not statistically significant (β = 0.103, t-value = 1.184, $p \geq 0.209$). Hypothesis 3 (H3), which predicted that professional capabilities of faculty has positive influence on faculty performance was supported as standardized estimate (β) of the path of structural model was significant (β = 0.784, t-value = 30.287, $p \leq 0.01$). Hypothesis 4 (H4) that proposed positive influence of student teacher ratio on faculty performance was supported because standardized estimate (β) of the path of structural model was significant (β = 0.717, t-value = 28.683, $p \leq 0.01$). Hypothesis 5 (H5) stated that faculty engagement would have positive influence on faculty performance was supported as the standardized estimate (β) of the path of structural model was significant (β = 0.745, t-value = 13.232, $p \leq 0.01$).

V. DISCUSSION

Professional capabilities of faculty play an important role in driving faculties for better performance. The results of the structural model and mean respondents score of the construct revealed that Professional capabilities of faculty had significant and positive influence on faculty performance in higher education institution. The standardized estimate of structural model indicated that Professional capabilities of faculty was the most important factor influencing faculty performance in higher education institution. Further, quality education student teacher ratio, faculty engagement were the key factors which positively influenced faculty performance. Previous studies carried out under revealed that Professional capabilities of faculty was the most important factor influencing faculty engagement (Cate et al., 2014; Guraya et al., 2015). The faculty performance may vary according to the higher education environment. The analysis of the structural model indicated that student background had no significant influence on faculty performance in higher education because standardized estimate was statistically insignificant. Further, the mean respondents score of the construct as well as

different items of the construct also revealed that student background had no significant effect on faculty performance. Faculty engagement is an important factor that influences faculty performance. The analysis of the structural model indicated that faculty engagement had a significant and positive influence on faculty performance. The mean respondents' score of construct and different items of construct revealed that faculty engagement had a positive influence on faculty performance. The influence of student teacher ratio on faculty performance. The analysis of the structural model indicated that student teacher ratio had a significant and positive influence on faculty performance. Further, the mean respondents' score of construct and different items within the construct revealed that student teacher ratio had a positive influence on faculty performance. This is due to fact that the good student teacher ratio, do not restrict faculty performance in higher education institution. In recent years, quality education has become an important factor which influence faculty performance. The analysis of structural model demonstrated that quality education had significant and positive influence on faculty performance in higher education institution. Further, the mean respondents score of construct and different items within the construct also revealed that quality education had positive influences on faculty performance in higher education institution. The previous studies carried out under wide range of academic environment and economic conditions support the findings of this study (Zander et al., 2013; Ghvanidze et al., 2016; O' Connor et al., 2017).

VI. CONCLUSIONS

It is clear that a variety of different and hidden elements impact how students perceive and experience their education, ranging from class size, leisure time, and assessment techniques to relationships with peers and teachers, ethical atmosphere, and extracurricular possibilities. Similarly, whether or not a program's receivers are pleased students may have nothing to do with the actual information offered via it. It is critical to approach dentistry studies from the standpoint of the student, as education entails much more than information acquisition or training. It's critical that the educational environment's ethos emphasises learning rather than passive information transmission. In this regard,

assessment methods should be devised and presented in such a way that students' awareness of their own knowledge and abilities is enhanced, a continual self-evaluation attitude is stimulated, and self-directed learning is promoted. Furthermore, the experiences of students who are having learning challenges and are under higher pressures, academic or otherwise, reflect the friendliness of any educational institution. It is critical that a dental education institution values its students' general well-being and quality of life, as well as providing assistance to those who require it. The administrators saw opportunities to support and frame policies, practises, and structures on campus that would improve faculty members' volitional autonomy, perceived competence, and perceived relatedness. Administrators may give resources to promote faculty competency in their positions as teachers and researchers, but they may not be considering how to ensure faculty volitional decision-making in their multiple responsibilities. Furthermore, administrators may be overlooking the critical impact that belonging or connection to other faculty members plays in faculty recruitment, retention, and overall work performance of faculty in higher education institution.

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