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Influence of digital leadership on Malaysian public university branding: professionals' identity as mediator

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ABSTRACT

The purpose of this study was to identify the influence of digital leadership on the professional identity and branding of public university education programs in Malaysia. A quantitative method was chosen in this study by using simple random sampling. The study population was 13,804 people, while the study sample was 476 students of education programs at Universiti Utara Malaysia (UUM), Universiti Tun Hussein Onn Malaysia (UTHM), Universiti Putra Malaysia (UPM) and Universiti Malaysia Sabah (UMS) involved. Data was analyzed using IBM-SPSS-Amos version 24. The results of the analysis show the digital leadership has an impact on professional identity and branding of public university education programs in Malaysia. In fact, professional identity are also partial mediators between the relationship between digital leadership and branding. The findings of this study are perceived to have the potential to impact the variable models of the study and represent one of the early research endeavors in this field, serving as a foundation for future studies. In addition, the results of this study are expected to provide new input to university management, stakeholders and investors to be used as a guide during the digital transformation process carried out on campus.

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1. INTRODUCTION

The 21st Century Education (in Malaysia called *Pembelajaran Abad* ke-21 or abbreviated as PAK21) is often associated with Industrial Revolution 4.0 (IR 4.0). In this PAK21 as well, the application of digital technology is seen to have had a great impact on aspects of human life, including in the education sector. In fact, PAK21 can be said to be the education of the future that makes high-impact digital technology a medium of teaching and learning (in Malaysia called *pengajaran dan pembelajaran* or abbreviated as PdP). Therefore, to make this wish come true, an organization needs a leader who has insight and is competent in its management. This statement is supported by previous research [1], where the success of an organization depends on effective leadership. This is because leaders will determine the culture, values and motivation of employees by planning strategies, implementing and ensuring the effectiveness of those strategies [2].

In this regard, digital leadership refers to the use of high-impact technology along with digital tools in the management and administration of an organization, no exception in higher education organizations [3]. However, digital transformation has invited various problems to the university from the aspect of the organizational system, especially regarding service procedures, handling and student evaluation [4]. This is because, students will evaluate and compare the quality of each higher education institution (HEI), and this

will affect the demands, expectations and behavior of individuals that will put pressure on educational organizations that still use conventional methods, causing these organizations to lag behind their competitors [5]. For example, BlackBerry, Nokia, Kodak and Microsoft were once companies that dominated the market but are now only names as a result of rejecting digital transformation in their management. This statement is agreed by [6] who states that the world of education today shows results that are still not very effective despite the integration of digital technology on a large scale.

Therefore, the digital interaction and communication that has been comprehensively introduced during the recent COVID-19 pandemic has been found to take place in very limited conditions and this has made it difficult for leaders in educational organizations to convert the old culture into a new culture, especially from the aspect of building friendly relationships between students and lecturers [7]. As evidence, a report in the Shared Prosperity Vision 2030 (in Malaysia called *Wawasan Kemakmuran Bersama* or WKB 2030) by the Ministry of Economic Affairs, Malaysia found that the level of high technology use in the manufacturing sector was only 37%, while 20% in the service sector, and this amount was found to be still low even though the sectors this contributes almost 79% to the Gross Domestic Product (GDP). Based on this report as well, the community, especially the Bumiputera, is still lagging behind in the field of selected professional jobs. It clearly shows that digital transformation will fail due to fear and lack of self-confidence to use technological devices during the PdP process [8].

This is because the implementation of digital transformation causes students to experience confusion about the role they should play as well as the identity they should highlight which has affected their learning [9]. There is also a view that the process of integrating digital technology has affected the creativity of students due to the age factor of the teaching staff [10], [11]. This situation to some extent affects the branding of *Institusi Pengajian Tinggi Swasta* (IPTs) or private university, especially IPTs that do not want to change, causing the uniqueness that is symbolic of IPT's success to not be evident, and the absence of this uniqueness causes society to be unable to compare and differentiate between IPTs [12]. It is even sadder when there are members in the professional field who have lost their professionalism due to fraud and misconduct that has permeated their careers [13], [14].

This statement is supported by [15] who found that distraction by excessive use of social media can damage students' focus and level of academic achievement if not curbed early will have an impact on unethical behavior including in the workplace. This can have a negative impact on their moral and ethical development. This is because, the digitalization process and the use of high-impact technology are often associated with professionals who are skilled, knowledgeable and efficient in handling high-tech tools for the survival of the organization [16]. In fact, the emphasis on professional identity formation has been driven by challenges and constraints in the previous professional education paradigm [17].

In fact, there are also individuals who show rejection behavior or discomfort towards the change in professional identity that occurs as a result of digital transformation [9]. This can include personal resistance or reluctance to embrace changes in the way we work and interact with technology. In addition, the lack of research in exploring the conceptualization of professional identity where there is no established theoretical framework to understand more deeply the process of professional identity formation has prevented research in effective pedagogical approaches to develop student professional identity [18]. In addition, studies on strategies that will launch the professional development of student identity in the field of education have also not received a favorable response among researchers [19].

Because of that, there is a recommendation by the researchers that the theories related to the professional development of identity in higher education be studied in more depth, but until now there are still disagreements regarding the most effective approach to increase and strengthen the professional development of identity among students [19]. Research in the professional development of identity for education students is also considered quiet by researchers even though the theories presented are highly regarded and widely used in the field of education as a method to increase student motivation [16]. Therefore, the construction of a distinctive and unique brand image is a fundamental matter that needs to be highlighted by HEIs to influence the evaluation of prospective students, staff, investors and stakeholder [20].

According to previous research [20], the failure to create the uniqueness of HEIs also has an impact on the branding of the university and has an impact on marketing and promotion efforts, especially for more conservative educational organizations, with limited funds and not solely profit oriented. Therefore, effective digital leadership and professional identity development are important factors to improve the image of the university because the conditions for the branding process to occur require human resources and expertise [20]. As PdP takes place online during the COVID-19 pandemic, this study was conducted to identify the level of effectiveness of digital technology integration that may affect student professional identity and the branding of public university education programs in Malaysia. Therefore, based on the problems that have been discussed, this study needs to be conducted to unravel all the questions and find answers as to whether it is true that digital leadership practiced by HEI students can have an impact on their professional identity and can improve branding public university education programs in Malaysia.

2. METHOD

2.1. Sample

The study population included 13,804 students of the bachelor of education degree program (PISMP) at Universiti Utara Malaysia (UUM) representing the Northern zone of Peninsular Malaysia, Universiti Putra Malaysia (UPM) representing the Western zone of Peninsular Malaysia, Universiti Tun Hussein Onn Malaysia (UTHM) representing the Southern zone of Peninsular Malaysia, and Universiti Malaysia Sabah (UMS) representing the East Malaysia zone. However, a total of 476 respondents were involved as a randomly selected sample of this study, and this number was sufficient to represent the study population based on the recommendations of Krejcie and Morgan. Based on the distribution of respondents obtained, 71.8% were female respondents, while 28.2% were male respondents. Meanwhile, fourth year respondents are the majority of students which is 73.3%.

2.2. Instrument

The research instrument is divided into four parts, namely part A related to the demographics of the respondents; part B is a questionnaire to measure the digital leadership of students adapted from previous study [21] which consists of five dimensions and 23 items; part C is a professional identity questionnaire consisting of seven dimensions and 23 items adapted from the Macleod Clark Professional Identity Scale (MCPIS-9) [22], [23] based on Self Determination Theory (SDT); while part D is a branding questionnaire containing five dimensions and 18 items adapted from [20]. These three questionnaires use a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). The dimensions of digital leadership, professional identity and branding and the overall value of Cronbach's alpha coefficient ranged from 0.61 to 0.94. Therefore, the alpha value for this study is acceptable because it meets the minimum level of 0.60 for Cronbach's alpha [24].

2.3. Data analysis

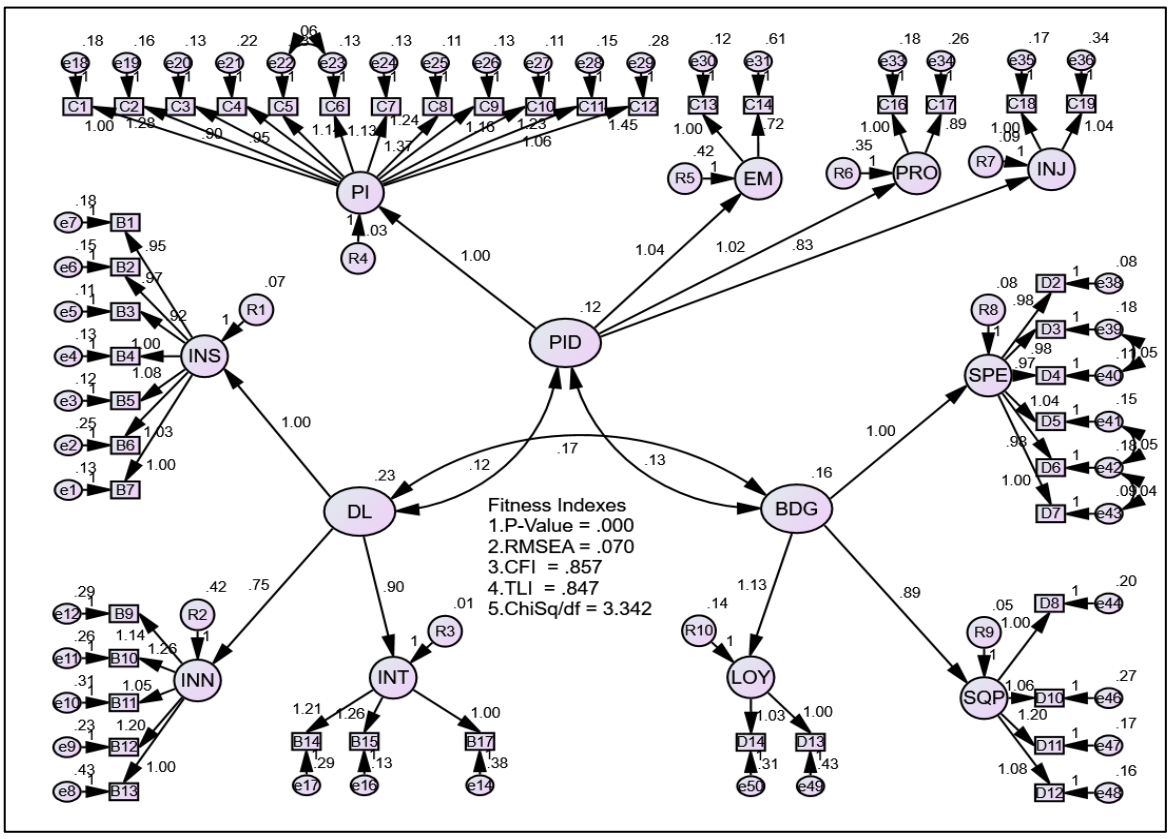
The data obtained were analyzed using IBM Statistical Package for Social Science (IBM-SPSS) version 26 for descriptive statistics, inference statistics and exploratory factor analysis (EFA), while for confirmatory factor analysis (CFA) used IBM-SPSS-AMOS version 24. It is important to carry out EFA to reduce factors that will influence study variables to several smaller and specific sets of variables. Meanwhile, CFA also involves a factor validation structural model that needs to be built to validate all latent construct measurement models so that the validity and reliability of the items and each dimension included in the instrument is high. In this case, the EFA was conducted using data from the pilot study, while the CFA was conducted using data from the field study [25]–[27].

2.3.1. Exploratory factor analysis (EFA)

Exploratory factor analysis is a statistical method used by researchers to obtain the latent basic structure of relatively large items [28]–[32] and is a factor analysis method that aims to recognize the basic relationship between each item evaluated. Since the research instruments are adapted from western researchers, the back-to-back translation process allows for misinterpretation of the items in the research questionnaire due to cross-cultural issues. Therefore, EFA needs to be carried out to avoid the problem. By referring to the Kaiser-Meyer-Olkin (KMO) test and the Bartlett Test of Sphericity to measure the extent of the data value for the purpose of factor analysis before an item is removed from the research instrument. In this regard, the suggested KMO value is above 0.7 [28]. The results of the analysis show that after the process of extracting the components it is found that only item factor weighting values that are more than 0.60 (>0.60) and eigenvalues of more than one is taken into account because these items are considered to have high validity. Meanwhile, the cumulative percentage is not more than 60% [28], [33].

2.3.2. Confirmatory factor analysis (CFA)

Confirmatory factor analysis needs to be done to confirm the latent construct measurement model through uni-dimensional analysis, validity and reliability [30], [34], [35]. Therefore, the latent construct measurement model needs to pass three types of validity, namely construct validity, convergent validity, and discriminant validity [28]. Construct validity is assessed through the measurement model fit index (fitness indexes), while convergent validity is assessed through the calculation of average variance extracted (AVE), and discriminant validity is assessed through the discriminant validity index summary. Figure 1 displays the pooled-CFA measurement model of digital leadership, professional identity and branding, while Table 1 displays the results of the CFA analysis for the variables of digital leadership, professional identity and branding. Meanwhile, Table 2 shows the AVE value for all three study variables and must reach a minimum value of 0.50 [18].



Note: digital leadership (DL), professional identity (PID), branding (BDG), source of inspiration (INS), innovation skills (INN), interpersonal skills (INT), personal identity (PI), extrinsic motivation (EM), professionalism (PRO), introject (INJ), sharing positive experiences (SPE), sharing quality programs (SQP), loyalty (LOY).

Figure 1. Pooled-CFA measurement model of digital leadership, professional identity and branding

Table 1. The CFA results: fitness index value

Category name	Index name	Fitness index value	Level of acceptance
Absolute fit	RMSEA	0.070	The required level is reached (<0.08)
Incremental fit	CFI	0.857	The required level is reached (> 0.85)
	TLI	0.847	The required level is reached (> 0.85)
Parsimonious fit	Chisq/df	3.342	The required level is reached (<5.0)

*The index in bold that shows the largest value is chosen one to report because it is in the same group

Table 2. The AVE values result for the study variables

Variable	AVE value	Level of acceptance
Digital leadership	0.652	The required level is reached (>0.50)
Professional identity	0.500	The required level is reached (>0.50)
Branding	0.657	The required level is reached (>0.50)

3. RESULTS

To answer the first research question, data analysis using the structural equation modeling (SEM) method was used. Figure 2 displays the results of the regression coefficient value and significance level (p value). Table 3 is a summary from Figure 2 of the results of the SEM analysis between the dimensions of digital leadership against the professional identity variable and the branding variable. Based on Table 3, the Beta value is 0.028, meaning that when the source of inspiration construct increases by 1 unit, the professional identity construct also increases by 0.028. Meanwhile, the critical ratio (CR) value (CR=3.433, p<0.001) shows that the influence of the source of inspiration construct in predicting the construct of professional identity is significant. Next, the Beta value is 0.020, meaning that when the construct of interpersonal skills increases by 1 unit, the construct of professional identity also increases by 0.020. While the CR value (CR=2.422, p<0.05) illustrates that the influence of the construct of interpersonal skills predicting the construct of professional identity is significant.

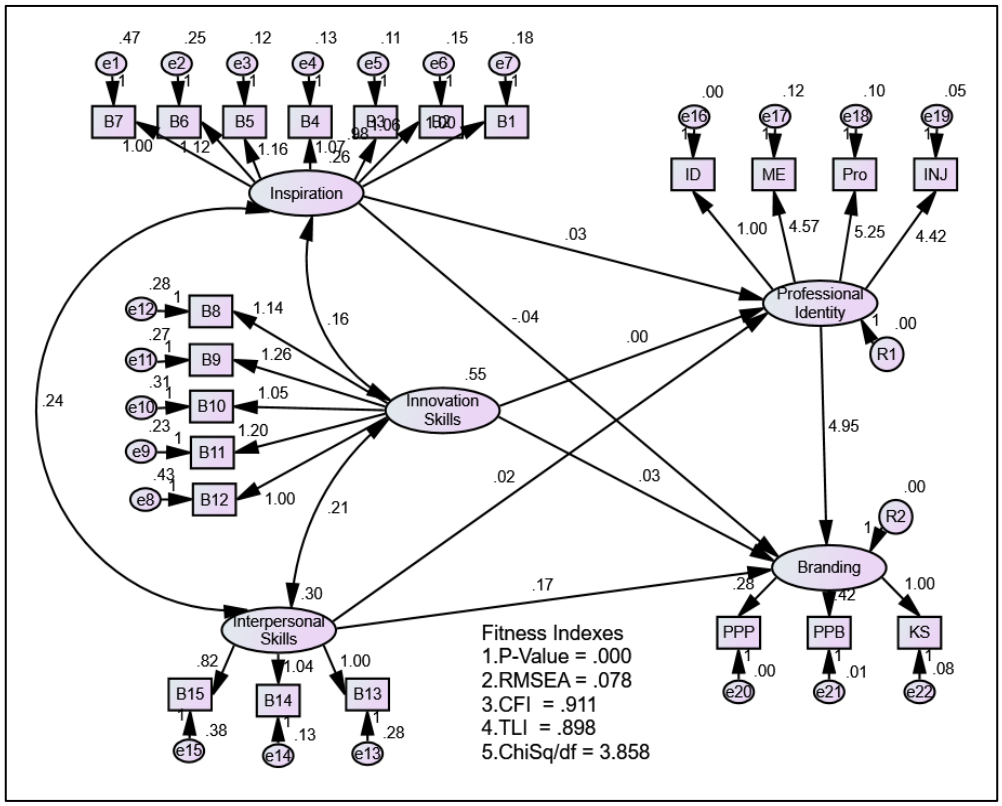


Figure 2. SEM model for estimated regression coefficient between constructs

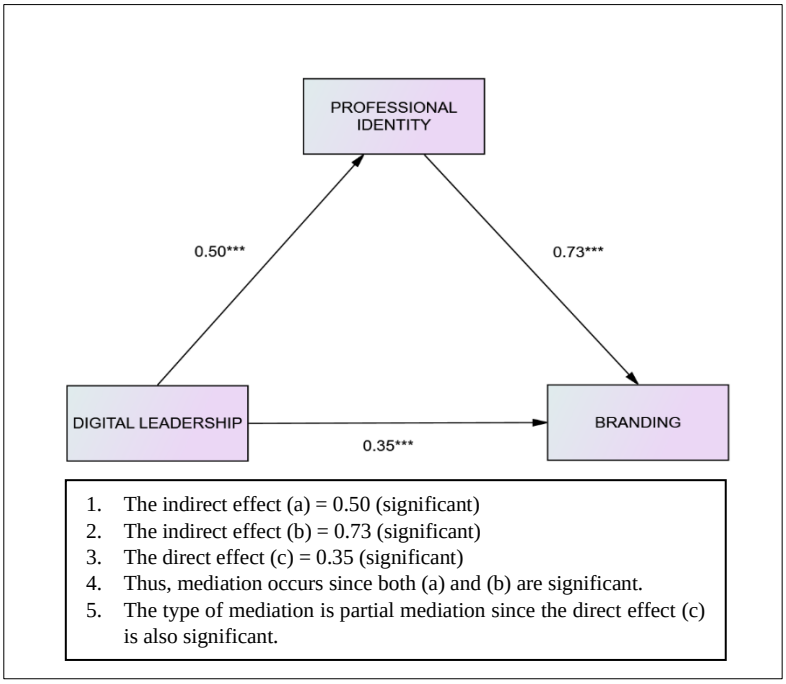
Table 3. Regression coefficient value and significance level (p-value)

Construct	Path	Construct	Beta	Std error (SE)	Critical ratio (CR)	p-value	Results
Professional identity	<---	Source of inspiration	0.028	0.008	3.433	***	Significant
Professional identity	<---	Innovation skills	-0.004	0.002	-1.796	0.072	Not significant
Professional identity	<---	Interpersonal skills	0.020	0.008	2.422	0.015*	Significant
Branding	<---	Source of inspiration	-0.040	0.046	-0.872	0.383	Not significant
Branding	<---	Innovation skills	0.029	0.014	2.105	0.035*	Significant
Branding	<---	Interpersonal skills	0.172	0.049	3.516	***	Significant
Branding	<---	Professional identity	4.950	0.566	8.748	***	Significant

***p<0.001, *p<0.05

In addition, the Beta value is 0.029, which means that when the innovation skill construct increases by 1 unit, the branding construct also increases by 0.029. While the CR value (CR=2.105, p<0.05) has proven that the influence of the innovation skill construct predicts the branding construct is significant. Therefore, the Beta value of 0.172 shows that when the interpersonal skills construct increases by 1 unit, the branding construct also increases by 0.172, while the CR value (CR=3.516, p<0.001) also proves that the influence of the interpersonal skills construct predicts the branding construct is significant.

In this case too, it was found that the Beta value of 4.950 explained that the professional identity construct increased by 1 unit, then the branding construct also increased by 4.950, even the professional identity construct had a significant effect (p<0.001) on the branding construct. In conclusion, only the inspiration resource dimension and the interpersonal skills dimension of the digital leadership variable have an impact on the professional identity variable, but the innovation skills dimension has no influence on the professional identity variable. Meanwhile, the dimension of innovation skills and the dimension of interpersonal skills have an impact on the branding variable. Next, Figure 3 is the result of the standardized regression coefficient value and significance for each path. Table 4 shows the results obtained after the mediator testing was conducted for the three research variables, namely digital leadership, professional identity and branding. Meanwhile, Figure 3 is a summary of mediator testing.



***p<0.001

Figure 3. Testing study mediators

Table 4. Standard regression coefficient and significance for each path

Construct	Path	Construct	Standard regression	p-value	Results
Professional identity	<---	Digital leadership	0.502	***	Significant
Branding	<---	Professional identity	0.730	***	Significant
Branding	<---	Digital leadership	0.349	***	Significant

***p<0.001

4. DISCUSSION

Based on Table 4, the results of the SEM analysis have proven that the dimension of the source of inspiration and the dimension of interpersonal skills of the digital leadership variable are significant predictors of the professional identity variable. Therefore, this finding is supported by previous research [36] where the combination of didactic and practical aspects can directly or indirectly influence the learning and professional development of an individual's identity during digital transformation. In fact, this finding is also supported by the study [37] which suggested that a typology of five digital leadership characteristics should be prioritized, namely digital competence, digital culture, digital differentiation, digital governance, and digital advocacy to change the learning environment because the expertise of digital leaders is highly dependent on knowledge in order to can create a positive culture among students. In fact, the professional development of an educator is important to navigate the PdP process where organizational communication, professional collaboration and reflective practice are found to be the main contributing factors to support the professional development of individual identity [38]. Therefore, educators who have multiple identities that alternate in social interaction with their students will give implications to the pedagogical process.

The findings of this study were contradicted by several researchers [15], [39] who reported that 42.28% of students and 39.10% of teaching staff think that some social symptoms and cultural issues are an obstacle to the successful implementation of e-learning which has led to behavioral changes and caused family problems. However, other studies [40], [41] takes the opposite view by stating that digital leadership behavior through virtual meetings, discussions, sharing, communication, teaching, supervision, monitoring, development, professionalism and promotional efforts is to create a digital learning space for students more effectively. Therefore, digital leadership and self-identity applied in students as a result of acceptance of innovation as well as increased knowledge while dealing with lecturers [42]. Kusumawati [41] disagreed stating that digital leadership was found to have no significant effect on the effectiveness of organizational crisis management based on a regression curve that did not depict the relationship between the variables. However, logically the data obtained by the university to determine and deal with issues such as marketing

issues, inequality, performance ranking and so on can be combined to evaluate and strengthen infrastructure, software and measurement as the architect of digital technology construction in HEIs [43], [44].

Based on Figure 3, the results of the mediator analysis have proven that professional identity is a partial mediator variable in this study. Therefore, professional identity act as mediators in the relationship between digital leadership and the branding of public university education programs in Malaysia. This is because both indirect and direct effects are significant. This finding is supported by Panda *et al.* [45] who stated that the mediator of reputation has an effect in the relationship between the image of the university brand and the level of student satisfaction. This is because, customer value plays a major role in developing an organization's brand through quality mediation [46]. Therefore, the emphasis on moral knowledge that plays an important role in managing life needs to be applied to the new generation so that the use of social media can be used as a bridge for effective interaction and communication processes in the digital world towards the formation of pious and high-integrity personalities [47]. In addition, the significant moderating influence of the age and maturity factors of an organization can affect the digital self-efficacy and digital transformation in an individual which in turn will determine the performance of the organization [48]. However, the results were contradicted by Heidari *et al.* [49] who stated that the use of online social networks in a higher education environment can affect the professional construction of student identity when social media is used as an intermediary.

5. CONCLUSION

Based on the findings of this study, it can be concluded that student digital leadership can influence the professional identity and branding of public university education programs in Malaysia. In fact, several suggestions have been identified for consideration, which is to suggest that the university management and stakeholders in the education system should intensify their efforts by implementing and ensuring the success of digital integration on campus to a very satisfactory level by providing the latest guidelines, complete and modern facilities for help students manage their learning time effectively in addition to being able to increase student motivation. In addition, the faculty is also advised to balance students' academic assignments so that the digital transformation process can run smoothly and in line with the professional development of the student's identity, which is one of the main pillars of the university's branding benchmark.

Since this study was conducted in four public universities in Malaysia, it is therefore suggested that this study be continued by involving other public or private universities to get a clearer picture of the scenario happening on campus today. Furthermore, the respondents only consist of education program students, it is suggested to also expand the study on other program students to obtain more in-depth and detailed information. In addition, future studies can add qualitative research methods by using a mixed method approach so that the results of the study are more in-depth and detailed where the factors that influence the variables will be more significant.

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REFERENCES

[1] I. Gün and Ö. Aslan, "Digital leadership in healthcare organization," in *HEALTH SCIENCES Current researches and new trends-3*, 1st ed., A. Güler and C. Başkan, Eds., IVPE, 2021, pp. 50–66.

[2] G. Borowska, "Digital leadership for digital transformation," *Współczesna Gospodarka*, vol. 10, no. 3, pp. 11–19, 2019, doi: 10.26881/wg.2019.4.02.

[3] A. R. A. Aziz, "Digital revolution in teaching and learning," in *The digital revolution in teaching and learning in Choosing to be relevant in the pandemic era*, 3rd ed., S. S. Othman, Ed., Faculty Leadership and Management (in Malay), 2021.

[4] P. Vázquez-Villegas, M. Reyes-Millán, and J. Membrillo-Hernández, "The new reality in digital teaching implies the inclusion of personalized digital education as an essential element for the future," *E-Learning and Digital Media*, Mar. 2024, doi: 10.1177/20427530241239392.

[5] P. Clark, C. Chapleo, and K. Suomi, "Branding higher education: an exploration of the role of internal branding on middle management in a university rebrand," *Tertiary Education and Management*, vol. 26, no. 2, pp. 131–149, Jun. 2020, doi: 10.1007/s11233-019-09054-9.

[6] C. Brown, L. Czerniewicz, C. W. Huang, and T. Mayisela, "Curriculum for digital leadership: A concept paper," Commonwealth of Learning (COL), 2016.

[7] C. Lay, M. S. Gashi, and C. Ternström, "Digital leadership in Swedish trade companies: A qualitative study about Covid-19's impact on leadership in Swedish trade companies," Thesis, Linnaeus University, 2021. [Online]. Available: https://www.diva-portal.org/smash/record.jsf?pid=diva2:1574547.
[8] L. Alwazzan, "Saudi Arabian women in medical education: A mixed method exploration of emergent digital leadership," Thesis, University of Ottawa, 2019.
[9] R. Wänlund and B. Zhou, "The role of professional identity in digital transformation the case of heavy equipment operators in the Swedish earth-moving industry," Master Thesis, KTH Royal Institute of Technology, 2021.
[10] M. Wolf, A. Semm, and C. Erfurth, "Digital transformation in companies – challenges and success factors BT - innovations for community services," in *Innovations for Community Services. I4CS 2018. Communications in Computer and Information Science*, M. Hodoň, G. Eichler, C. Erfurth, and G. Fahrnberger, Eds., Cham: Springer International Publishing, 2018, pp. 178–193.
[11] M. D. Gardiana, A. N. Rahmanto, and I. A. Satyawan, "International branding of higher education institutions towards world-class universities: Literature study in 2017-2022," *Journal of Social and Political Sciences*, vol. 6, no. 1, pp. 45–60, Mar. 2023, doi: 10.31014/aior.1991.06.01.392.
[12] M. M. Yusoff, K. Siarap, R. Mohamed, and R. Mijan, "Branding of institutions of higher learning: Branding practices in Universiti Sains Malaysia," (in Malay), *Jurnal Pengajian Media Malaysia*, vol. 10, no. 1, pp. 109–134, 2008.
[13] A. Aguilar, L. Stupans, and S. Scutter, "Assessing students' professionalism: Considering professionalism's diverging definitions," *Education for Health*, vol. 24, no. 3, p. 599, 2011, doi: 10.4103/1357-6283.101417.
[14] M. W. Rabow, R. N. Remen, D. X. Parmelee, and T. S. Inui, "Professional formation: extending medicine's lineage of service into the next century," *Academic Medicine*, vol. 85, no. 2, pp. 310–317, Feb. 2010, doi: 10.1097/ACM.0b013e3181c887f7.
[15] N. I. N. Zainan, N. H. A. @Ab Rahman, M. K. A. Ismail, N. A. mat Jusoh, Z. M. Busu, and Z. Yusoff, "The impact of social media on moral decline among students: A preliminary survey," (in Malay), *Proceedings of International Conference on Language, Education, Humanities &Social Sciences*, pp. 98–103, 2021.
[16] M. F. Mylrea, T. Sen Gupta, and B. D. Glass, "Design and evaluation of a professional identity development program for pharmacy students," *American Journal of Pharmaceutical Education*, vol. 83, no. 6, p. 6842, Aug. 2019, doi: 10.5688/ajpe6842.
[17] D. M. Irby and S. J. Hamstra, "Parting the clouds: Three professionalism frameworks in medical education," *Academic Medicine*, vol. 91, no. 12, pp. 1606–1611, Dec. 2016, doi: 10.1097/ACM.0000000000001190.
[18] M. Holden, E. Buck, M. Clark, K. Szauter, and J. Trumble, "Professional identity formation in medical education: The convergence of multiple domains," *HEC Forum*, vol. 24, no. 4, pp. 245–255, Dec. 2012, doi: 10.1007/s10730-012-9197-6.
[19] F. Trede, R. Macklin, and D. Bridges, "Professional identity development: a review of the higher education literature," *Studies in Higher Education*, vol. 37, no. 3, pp. 365–384, May 2012, doi: 10.1080/03075079.2010.521237.
[20] C.-T. Chen, "The investigation on brand image of university education and students' word-of-mouth behavior," *Higher Education Studies*, vol. 6, no. 4, pp. 23–33, Sep. 2016, doi: 10.5539/hes.v6n4p23.
[21] R. J. House, P. J. Hanges, S. A. Ruiz-Quintanilla, P. W. Dorfman, S. A. Falkus, and N. M. Ashkanasy, "Cultural influences on leadership and organizations: Project GLOBE," in *Advances in Global Leadership*, 2nd ed., Bingley: Emerald Group Publishing Ltd, 1999, pp. 171–233.
[22] K. Adams, S. Hean, P. Sturgis, and J. M. Clark, "Investigating the factors influencing professional identity of first-year health and social care students," *Learning in Health and Social Care*, vol. 5, no. 2, pp. 55–68, 2006, doi: 10.1111/j.1473-6861.2006.00119.x.
[23] R. L. Worthington and T. A. Whittaker, "Scale development research: A content analysis and recommendations for best practices," *The Counseling Psychologist*, vol. 34, no. 6, pp. 806–838, Nov. 2006, doi: 10.1177/0011000006288127.
[24] F. Hussin, J. Ali, and M. S. Z. Noor, *SPSS research & data analysis methods*. UUM Press (in Malay), 2014. doi: 10.32890/9789670474670.
[25] J. Baistaman, Z. Awang, A. Afthanorhan, and M. Zulkifli Abdul Rahim, "Developing and validating the measurement model for financial literacy construct using confirmatory factor analysis," *Humanities & Social Sciences Reviews*, vol. 8, no. 2, pp. 413–422, Apr. 2020, doi: 10.18510/hssr.2020.8247.
[26] A. Ehido, Z. Awang, B. Abdul Halim, and C. Ibeabuchi, "Developing items for measuring quality of work life among Malaysian academics: An exploratory factor analysis procedure," *Humanities & Social Sciences Reviews*, vol. 8, no. 3, pp. 1295–1309, Jun. 2020, doi: 10.18510/hssr.2020.83132.
[27] N. Fitriana, F. D. Hutagalung, Z. Awang, and S. M. Zaid, "Happiness at work: A cross-cultural validation of happiness at work scale," *PLOS ONE*, vol. 17, no. 1, p. e0261617, Jan. 2022, doi: 10.1371/journal.pone.0261617.
[28] Z. Awang, W. M. A. W. Afthanorhan, L. S. Hui, and N. F. S. Zainudin, *SEM Made Simple 2.0 a gentle approach of structural equation modelling*. Terengganu: UNISZA, 2023.
[29] N. Alias, Z. Awang, and H. Muda, "Policy implementation performance of primary school leaders in Malaysia: an exploratory factor analysis," *IIUM Journal of Educational Studies*, vol. 7, no. 2, pp. 22–39, Jul. 2020, doi: 10.31436/ijes.v7i2.222.
[30] A. S. Bahkia, Z. Awang, A. Afthanorhan, P. L. Ghazali, and H. Foziah, "Exploratory factor analysis on occupational stress in context of Malaysian sewerage operations," in *AIP Conference Proceedings*, 2019. doi: 10.1063/1.5121111.
[31] A. S. Bahkia, Z. Awang, A. Rahman, A. Nawal, N. A. Rahlin, and A. Afthanorhan, "An explicit investigation of occupational stress and safety behavior on the relationships between supportive leadership and safety compliance in sewerage industry," *Linguistics and Culture Review*, vol. 6, pp. 146–168, Dec. 2021, doi: 10.21744/lingcure.v6nS1.1987.
[32] H. Muda, Z. S. Baba, Z. Awang, N. S. Badrul, N. Loganathan, and M. H. Ali, "Expert review and pretesting of behavioral supervision in higher education," *Journal of Applied Research in Higher Education*, vol. 12, no. 4, pp. 767–785, Jun. 2020, doi: 10.1108/JARHE-02-2019-0029.
[33] J. F. Hair, B. J. Babin, R. E. Anderson, and W. C. Black, *Multivariate data analysis*, 8th ed., vol. 50, no. 181. Boston, Massachusetts: Cengage Learning, 2019. doi: 10.2307/2007941.
[34] M. Kashif, S. Zakiah Melatu Samsi, Z. Awang, and M. Mohamad, "EXQ: measurement of healthcare experience quality in Malaysian settings," *International Journal of Pharmaceutical and Healthcare Marketing*, vol. 10, no. 1, pp. 27–47, Apr. 2016, doi: 10.1108/IJPHM-03-2015-0011.
[35] A. A. Asnawi, Z. Awang, A. Afthanorhan, M. Mohamad, and F. Karim, "The influence of hospital image and service quality on patients' satisfaction and loyalty," *Management Science Letters*, pp. 911–920, 2019, doi: 10.5267/j.msl.2019.2.011.
[36] A. Acharya, R. C. Black, A. Smithies, and A. Darzi, "Evaluating the impact of a digital leadership programme on national digital priorities: a mixed methods study," *BMJ Open*, vol. 12, no. 4, p. e056369, Apr. 2022, doi: 10.1136/bmjopen-2021-056369.
[37] N. Ghamrawi and R. M. Tamim, "A typology for digital leadership in higher education: the case of a large-scale mobile technology initiative (using tablets)," *Education and Information Technologies*, vol. 28, no. 6, pp. 7089–7110, Jun. 2023, doi: 10.1007/s10639-022-11483-w.
[38] R. Marisa, S. Rachmajanti, and M. Anugerahwati, "Investigating the digital proficiency of English as a foreign language (EFL) educators in association with their professional identity," *JALT CALL Journal*, vol. 20, no. 2, pp. 1–31, 2024, doi:

10.29140/jaltcall.1315.
[39] A. Al-Hunaiyyan, R. A. Alhajri, and S. Al-Sharhan, "Perceptions and challenges of mobile learning in Kuwait," *Journal of King Saud University - Computer and Information Sciences*, vol. 30, no. 2, pp. 279–289, Apr. 2018, doi: 10.1016/j.jksuci.2016.12.001.
[40] R. Z. Prayuda, "Digital leadership of school principals in the digital era: A mini review article," (in Malay), *International Journal of Social, Policy and Law*, vol. 3, no. 1, pp. 13–18, 2022, [Online]. Available: https://ijospl.org/index.php/ijospl/article/view/94
[41] E. Kusumawati, "Digital leadership in education: A bibliometric analysis," (in Indonesian), *Journal of Education and Teaching (JET)*, vol. 4, no. 2, pp. 252–260, 2023, doi: 10.51454/jet.v4i2.254.
[42] T. I. Ahmed, A. R. Ibrahim, N. F. Ahmed, and D. A. Abdullah, "Faculty members' perspectives on organisational identity: digital leadership of universities of Nineveh governorate," *Indonesian Journal of Physical Education and Sport Science*, vol. 4, no. 2, pp. 127–139, 2024, doi: 10.52188/ijpess.v4i2.704.
[43] N. K. Hassan and S. A. Hamed, "The role of digital leadership in the effectiveness of organizational crisis management," *Journal of Positive School Psychology*, vol. 6, no. 4, pp. 5373–5379, 2022, [Online]. Available: https://journalppw.com/index.php/jpsp/article/view/4305.
[44] B. Williamson, S. Bayne, and S. Shay, "The datafication of teaching in higher education: Critical issues and perspectives," *Teaching in Higher Education*, vol. 25, no. 4, pp. 351–365, May 2020, doi: 10.1080/13562517.2020.1748811.
[45] S. Panda, S. C. Pandey, A. Bennett, and X. Tian, "University brand image as competitive advantage: a two-country study," *International Journal of Educational Management*, vol. 33, no. 2, pp. 234–251, Feb. 2019, doi: 10.1108/IJEM-12-2017-0374.
[46] S. Hashim, N. Mohd Yasin, and S. A. Ya'kob, "What constitutes student–university brand relationship? Malaysian students' perspective," *Journal of Marketing for Higher Education*, vol. 30, no. 2, pp. 180–202, Jul. 2020, doi: 10.1080/08841241.2020.1713278.
[47] S. M. H. S. A. Rahman, M. A. Ramli, C. Z. Sa'ari, A. A. Norman, M. A. Mamat, and M. H. M. Azhar, "Use of new social media: Islamic perspective issues and guidance," (in Malay), *Jurnal Usuluddin*, vol. 50, no. 1, pp. 69–92, 2022, [Online]. Available: https://ejournal.um.edu.my/index.php/JUD/article/view/37643.
[48] S. Malodia, M. Mishra, M. Fait, A. Papa, and L. Dezi, "To digit or to head? Designing digital transformation journey of SMEs among digital self-efficacy and professional leadership," *Journal of Business Research*, vol. 157, p. 113547, Mar. 2023, doi: 10.1016/j.jbusres.2022.113547.
[49] E. Heidari, G. Salimi, and M. Mehrvarz, "The influence of online social networks and online social capital on constructing a new graduate students' professional identity," *Interactive Learning Environments*, vol. 31, no. 1, pp. 214–231, Jan. 2023, doi: 10.1080/10494820.2020.1769682.

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